KANSAS CITY POWER & LIGHT COMPANY - KANSAS

KEEIA CYCLE 1 2017-2019 FILING

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List of Acronyms for KEEIA Cycle 1 Report

0329 S&A – Stipulation and Agreement in Missouri Case No. EO-2005-0329

04-1025 S&A – Stipulation and Agreement in Kansas Docket No. 04-KCPE-1025-GIE

AC or A/C – Air conditioner

ACEEE - American Council for an Energy-Efficient Economy

ACH – Air Changes per Hour

AEG – Applied Energy Group

ASC – Accounting Standards Codification

B/C – Benefit-cost

BB – Block bidding

BEER – Business energy efficiency rebate

BOC – Building operator certification

BPA – Bonneville Power Administration

Btu – British thermal unit

CAC – Central air conditioning

CFM50 – Air leakage rate in cfm at 50 Pascals of negative pressure

C&I – Commercial and industrial

CFL – Compact fluorescent light

CHP – Combined heat and power

CO_2 – Carbon dioxide

CONE – Cost of new entry

COMPANY – Kansas City Power & Light Company

CT – Combustion turbine

CURB – Citizens' Utility Ratepayer Board

DEER - Database for Energy Efficiency Resources

DHW – Domestic hot water

DR – Demand response

DRI – Demand response incentive

DSIM – Demand-side investment mechanism

DSM – Demand-side management

ECM - Electronically commutated motor

EE – Energy efficiency

EER – Energy efficiency ratio

EE Rider – Energy efficiency rider

EDC – Electric distribution companies

EF – Energy factor

EISA – Energy Independence and Security Act of 2007

EM&V – Evaluation, measurement and verification

EO – Earnings opportunity

EPRI – Electric Power Research Institute

ESF – Energy savings factor

FASB – Financial Accounting Standards Board

FERC – Federal Energy Regulatory Commission

FFO – Funds from operations

FR – Free rider

FTE – Full time equivalent employee

GAAP – General Accepted Accounting Principles

GMO – KCP&L Greater Missouri Operations Company

GPM – Gallons per minute

HE – High efficiency

HER – Home energy report

HID – High intensity discharge

HP - Horsepower

HSPF – Heating seasonal performance factor

HVAC – Heating, ventilating, and air conditioning

IE – Income-eligible

IEMF – Income-eligible multi-family

IL TRM – Illinois TRM

IMC – Incremental measure cost

IN TRM – Indiana TRM

IRP – Integrated resource plan

kBtuh – 1000 Btu per hour

KCC – Kansas Corporation Commission

KCP&L – Kansas City Power & Light Company

KEEIA – Kansas Energy Efficiency Investment Act

KHRC – Kansas Housing Resources Corporation

kW – Kilowatt

kWh – Kilowatt-hour

LED – Light emitting diode

MEEIA – Missouri Energy Efficiency Investment Act

MEF – Modified energy factor

MH/HPS – Metal halide/high pressure sodium

MPSC – Missouri Public Service Commission

MW – Megawatt

MWh – Megawatt-hour

NAECA – National Appliance Energy Conservation Act

NBF – Normal ballast factor

NEO – Net earnings opportunity

NPC - Net program costs

NPSO – Non-participant spillover

NPV – Net present value

NPVRR – Net present value revenue requirement

NTD - Net throughput disincentive

NTG – Net-to-gross

ODC – Opinion Dynamics Corporation

PCT – Participant cost test

PCT as used in TRM – Programmable communicating thermostat

PSO – Participant spillover

PTAC – Packaged terminal air conditioner

PTHP – Packaged terminal heat pump

PY – Program Year

QA/QC – Quality assurance/quality control

RIM – Rate impact measure

RFP – Request for proposal

RTO – Regional transmission organization

RTU – Remote terminal unit

S&A – Stipulation and agreement

SBDI – Small business direct install

SCT – Societal cost test

SEER – Seasonal energy efficiency ratio

SEM – Strategic energy management

T5HO – T5 high output

TD – Throughput disincentive

TRC – Total resource cost

TRM – Technical resource manual

UCT – Utility cost test

VSD – Variable speed drive

W - Watt

WACC – Weighted average cost of capital

SECTION | 1

Executive Summary

A. Filing Background

This Report outlines Kansas City Power & Light Company's (KCP&L or Company) request to establish a demand-side management (DSM) program portfolio consistent with the Kansas Energy Efficiency Investment Act (KEEIA),[1] which became effective on July 1, 2014.[2] The KEEIA was established to support the state goal of promoting the implementation of cost-effective demand-side programs in Kansas and the state policy to value demand-side program investments equal to traditional investments in supply and delivery infrastructure as much as practicable. This filing also relies upon the statutory provision to allow recovery of all reasonable and prudent costs with delivering commission-approved demand-side programs so long as the program (a) results in energy or demand-side savings; and (b) is beneficial to customers in the customer class for which the programs were implemented, whether or not the program is utilized by all customers in such a class. In addition, the statute allows the utility to establish a cost recovery mechanism to further encourage investments in demand-side programs.

This Report supports the Company's request for approval of a portfolio of programs that would be in effect January 1, 2017 through December 31, 2019, also referred to as KEEIA Cycle 1. KCP&L began implementation of DSM programs in Kansas as part of its Comprehensive Energy Plan approved by the Commission in an Order issued August 5, 2005 in Docket No. 04-KCPE-1025-GIE. KEEIA Cycle 1 will continue to build on the success of KCP&L's DSM pilot programs. In addition, the Company will leverage the learnings and experience gained from its Missouri Energy Efficiency Investment Act (MEEIA) Cycle 1 to be successful in Kansas by broadening the Company's DSM offerings in both states, continuing to improve customer participation, and enhancing customer experience.[3]

The Company's KEEIA Cycle 1 proposed programs are similar to those proposed and approved by the Missouri Public Service Commission (MPSC) under the MEEIA Cycle 2 Stipulation and Agreement (S&A).[4] These programs were developed based on stakeholder input; evaluation, measurement and verification (EM&V) results; potential study review; secondary evaluations and research; baseline changes; and program processes. It is reasonable for the Company to offer a similar portfolio of programs in its KEEIA Cycle 1 filing to benefit from economies of scale, as well as an overarching goal of the Company to offer a similar portfolio of DSM programs across both its Kansas and Missouri service territories to minimize customer confusion, maximize marketing opportunities, and utilize existing implementers across a broader customer base. Such consistency across all KCP&L jurisdictions reduces overall costs to deploy these programs.

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[1] K.S.A. § 66-1283 (2014 Supp.).

[2] Id.

[3] KCP&L-Missouri (KCP&L-MO) and KCP&L Greater Missouri Operations Company (GMO) have both completed their first cycle under the MEEIA (MEEIA Cycle 1), which concluded December 31, 2015.

[4] The Company recently filed for its MEEIA Cycle 2 in both KCP&L-MO and GMO. The MPSC approved the MEEIA Cycle 2 S&A on March 12, 2016. The MEEIA Cycle 2 programs will be effective on April 1, 2016 for the 36-month period ending March 31, 2019. See MPSC Report and Order Case No. EO-2015-0240 and EO-2015-0241.

The portfolio of programs under KEEIA Cycle 1 is designed to provide opportunities for all of KCP&L's Kansas customers to participate in energy efficiency (EE) and demand response (DR). The slate includes seven residential programs and seven business programs including two income-eligible programs and two educational programs. The portfolio includes a budget of $29.7 million over a 36-month period, energy savings of 91,700 MWh, and 52 MW of demand reduction.

The cost recovery mechanism proposed herein is consistent with the KEEIA statute.[5] The proposed rider is a contemporaneous cost recovery mechanism that includes recovery of program costs, a throughput disincentive (TD), and an earnings opportunity (EO). KCP&L's current recovery mechanism for DSM programs in Kansas is also a rider, known as the EE Rider. The EE Rider was established pursuant to the Commission's Order in Docket No. 07-KCPE-905-RTS issued in November 2007. It is updated by the Company annually on March 31 and recovers historical program costs for the prior calendar year for recovery over the following July through June period. The EE Rider was developed following approval of KCP&L's DSM portfolio within the Comprehensive Energy Plan.

In this KEEIA Cycle 1 filing, the Company proposes to continue using a rider mechanism for recovery of program costs; however, we propose to restructure it such that it recovers all three components: program costs, TD, and EO. Therefore, the proposed rider is referred to as the Demand-Side Investment Mechanism (DSIM) Rider. Similar to the EE Rider, the DSIM charge will be applied to the customer's energy usage on a dollar per kilowatt-hour ($/kWh) basis and be shown as a separate line on the customer's bill. The Company proposes to incorporate into the DSIM Rider the recovery of unrecovered costs from 2014, 2015 and 2016 under the EE Rider along with the program costs of KEEIA Cycle 1. This will allow for a single line on the customer's bill related to DSM.

In addition, the Company proposes a rigorous EM&V process to validate the energy and demand savings against deemed savings. We propose to utilize an independent, third party consultant to conduct the EM&V process with the Commission providing an independent auditor to review the EM&V results. The Company includes a Technical Resource Manual (TRM) within this filing, which provides for deemed energy and demand savings by measure for its proposed portfolio. We propose to utilize the deemed savings identified within the TRM to collect the TD through the DSIM Rider. However, with respect to the EO award, we propose a full, retrospective EM&V with no floor or ceiling on the net-to-gross (NTG) factor or ex post gross factor. The EO award will also allow for an adjustment of the TD using a floor and ceiling on the NTG ratio and an ex post gross adjustment with no floor or ceiling.

Lastly, KCP&L proposes regulatory flexibility language within its tariffs. This regulatory flexibility language will allow the Company to discontinue the entire KEEIA Cycle 1 portfolio with no less than thirty days' notice to the Commission if the Company determines that implementation of such programs is no longer reasonable due to changed factors or circumstances that have materially negatively impacted the economic viability of such programs as determined by the Company.

[5] The Company's KEEIA Cycle 1 cost recovery mechanism is also similar to that approved by the MPSC in the MEEIA Cycle 2 S&A.

B. Highlights of Plan

Overall Savings and Budget

This section of the Report presents the portfolio budgets, cumulative energy savings and cumulative demand savings for KEEIA Cycle 1. As shown below, the Company is proposing a robust portfolio program for residential and business customers. Programs include both EE and DR programs, as well as income-eligible (low income) and educational programs.

The portfolio program details are presented in Table 1-1. Figures 1-1 through 1-3 display budget, cumulative energy savings, and cumulative demand savings, respectively, for the period 2017-2019. The KEEIA Cycle 1 proposed budget and estimated savings reflect a ramp-up period that the Company believes will be necessary because its DSM offerings have been relatively minimal in Kansas since 2010. In addition, projected program savings targets have also been tempered by three major factors for this filing, which include:

- new federal appliance standards;
- fatigued market segments; and
- lower avoided costs.

The new federal standards and fatigued market segments lead to reduced savings and potentially lower participation, respectively, while the lower avoided costs impact the cost-effectiveness of measures considered for inclusion in the DSM portfolio. This is further discussed in Section 3E, *Factors Influencing Program Savings.*

As noted previously, one of the Company's overarching goals is to offer a similar portfolio of programs across both its Kansas and Missouri service territories. This is expected to enhance customer participation and eliminate confusion of varying programs across the Company's service territories. We feel strongly that offering similar programs in both states will eliminate inefficiencies in marketing and program delivery, and streamline administrative accounting.

Table 1-1 Program Details

	Cumulative 2017-2019[6]		
Program	**kWh Savings**	**Peak kW Savings**	**Budget **Confidential****
Residential Programs			
Home Lighting Rebate	14,048,548	1,431	[redacted]
Home Energy Report	13,891,150	2,872	[redacted]
Online Home Energy Audit	0	0	[redacted]
Whole House Efficiency	7,109,421	1,984	[redacted]
Income-Eligible Multi-Family	5,740,079	693	[redacted]
Income-Eligible Weatherization	84,888	31	[redacted]
Residential Programmable Thermostat	7,407,576	20,202	[redacted]
Business Programs			
Business Energy Efficiency Rebate - Standard	24,105,016	5,330	[redacted]
Business Energy Efficiency Rebate - Custom	6,329,847	1,755	[redacted]
Strategic Energy Management	3,360,535	883	[redacted]
Block Bidding	7,560,446	1,311	[redacted]
Online Business Energy Audit	0	0	[redacted]
Small Business Direct Install	2,018,800	337	[redacted]
Demand Response Incentive	0	15,032	[redacted]
Residential Total:	48,281,663	27,214	[redacted]
Business Total:	43,374,645	24,648	[redacted]
Research & Pilot	n/a	n/a	[redacted]
Portfolio Total:	**91,656,307**	**51,861**	[redacted]

[6] First-year cumulative incremental energy and demand savings for 2017 through 2019 are presented. Demand Response Incentive demand savings are presented as the savings planned to be achieved in Year 3.

Figure 1-1 Annual Estimated Program Budget by Program ($ thousands) **Confidential**

Figure 1-2 Cumulative Energy Savings by Program (MWh)

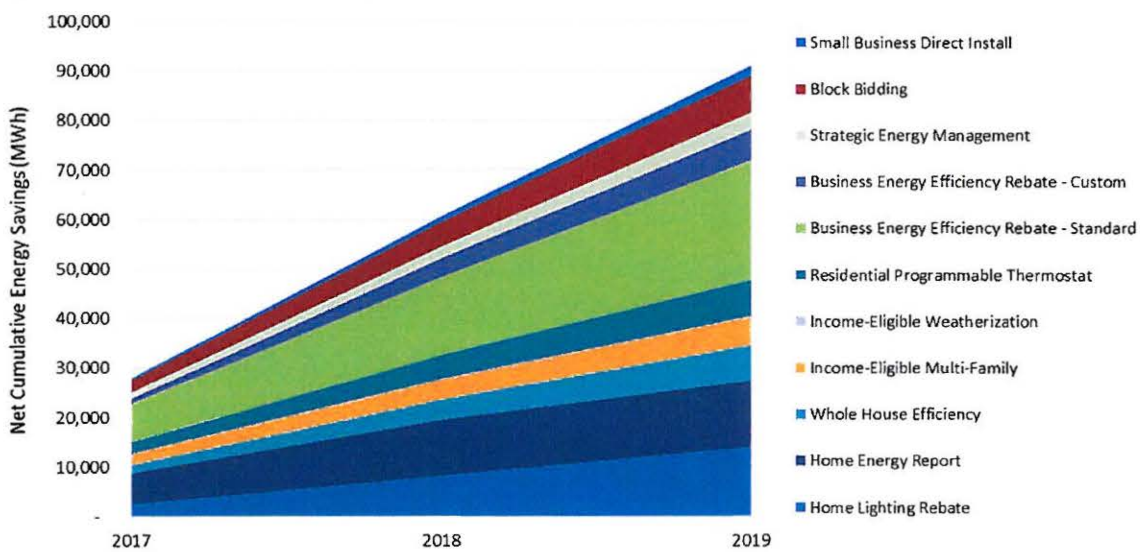


Figure 1-3 Cumulative Summer Peak Demand Savings by Program (MW)

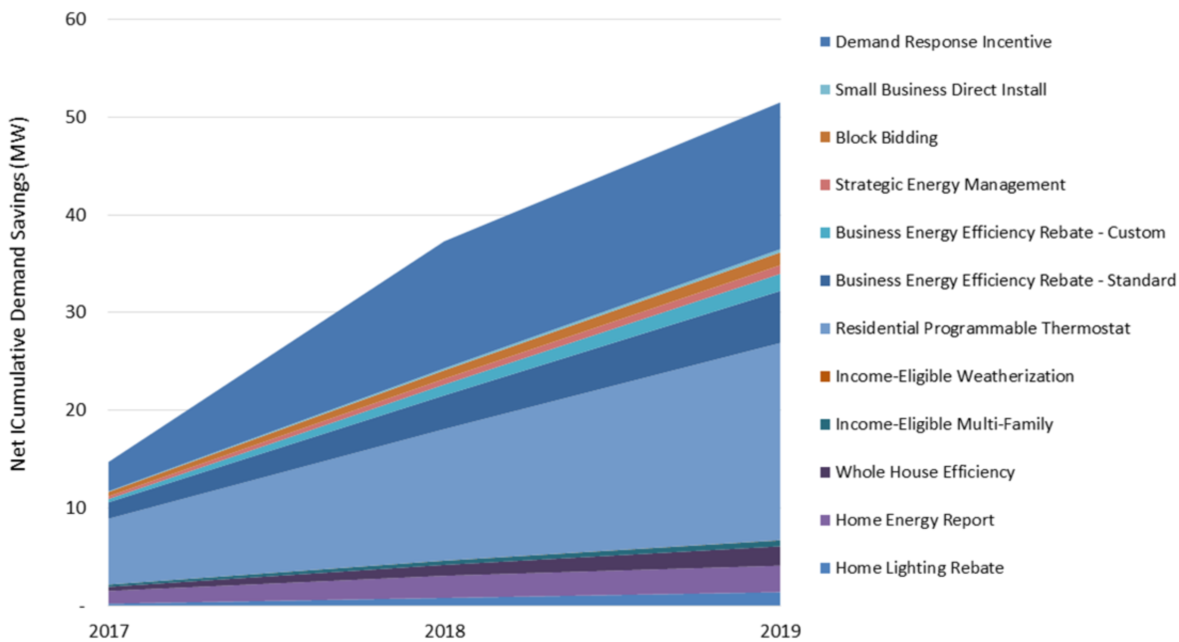


Table 1-2 presents program portfolio cost-effectiveness for each subcategory of program – residential, income-eligible, and non-residential (EE and DR). With the exception of the income-eligible programs, all other programs' Total Resource Cost (TRC) cost-effectiveness test results exceed 1.0. Each of the standard tests for cost-effectiveness is further described in Section 2 of this Report and program cost-effectiveness tests are included within the detailed program descriptions in Appendix A.

Table 1-2 Portfolio Cost-Effectiveness Summary

Program Type	TRC	UCT	RIM	RIM (Net Fuel)	SCT	PCT
Residential EE	1.55	2.57	0.58	0.71	1.85	3.15
Residential DR	2.22	2.73	1.46	1.59	2.14	1.94
Residential - Income-Eligible	1.19	2.06	0.51	0.62	1.38	3.54
Non-Residential EE	1.65	2.61	0.91	1.26	1.81	1.98
Non-Residential DR	12.49	2.22	2.22	2.22	11.63	50.00
Research & Pilot	-	-	-	-	-	-
Total Portfolio	**1.79**	**2.51**	**0.88**	**1.08**	**1.92**	**2.47**

C. Development of KEEIA Cycle 1 Plan

Program Offerings Based on Customer and Resource Needs

The Company has significant experience in offering DSM programs. This experience has been growing since the Company initially offered programs circa 2005 as a result of the Comprehensive Energy Plan in Kansas and Missouri, post Comprehensive Energy Plan in Kansas and Missouri, and under the MEEIA in Missouri. The portfolio proposed herein leverages this collective experience and builds upon the portfolio proposed for the MEEIA Cycle 2.

In developing the portfolio of programs now offered in Missouri and proposed here for Kansas, the Company engaged with the following stakeholders in order to present a strong portfolio to meet needs of customers, while still meeting the needs of the Company:

- Business customers
- Online residential panel
- Trade ally businesses
- Multi-family interest groups
- Program design consultant
- Program implementers
- Missouri DSM Advisory Group
- Environmental focused stakeholders
- Income-eligible focused stakeholders
- Company leadership

This cross-functional engagement was important to develop a portfolio that addresses a broad group of stakeholders who have varying interests and objectives, some both in Kansas and Missouri. The decisions and engagement gained from the Company's efforts to develop the portfolio for MEEIA Cycle 2 are also applicable to developing a robust portfolio for the KEEIA Cycle 1 filing. Some of the stakeholders have an interest in pursuing DSM in Kansas as well. Based on input from the above stakeholders, the Company's program design consultant (Applied Energy Group or AEG), and consideration of the most recent DSM potential study conducted in 2013 for all KCP&L service territories,[7] the Company created program recommendations for its MEEIA Cycle 2, and proposes to transfer this knowledge in this Application for a similar portfolio in Kansas; however, at different levels to address the resource needs in Kansas.

The Company has relied upon internal analyses to determine the appropriate levels of DSM for KCP&L. These levels were subsequently adopted in the Company's corporate plan and budget. Understanding that resource needs are different in Kansas and Missouri, the Company has reflected an appropriate level of DSM offerings in this filing.

Based on the Company's analysis, successful implementation of this proposed KEEIA DSM portfolio could bring gross shared benefits from both energy and capacity over the anticipated life of the programs of approximately $80.3 million. These benefits are shared by both participating and non-participating Kansas customers. The net present value (NPV) of the net shared benefits (gross benefits less program costs) is $50.6 million. Based on this analysis, benefits greatly exceed costs and support the Company's corporate plan, demonstrate positive financial benefits to its customers, and support the spirit and intention of the KEEIA legislation.

KEEIA Cycle 1 Framework

The major components of the KEEIA Cycle 1 framework include:

1. Program portfolio;

[7] The potential study is included as Appendix L.

2. Cost recovery mechanism which includes recovery of the TD, EO and program costs;
3. TRM;
4. Advisory Group;
5. EM&V; and
6. Tracking and reporting.

Program Portfolio

The KEEIA Cycle 1 DSM portfolio is comprised of seven residential programs and seven business programs that will deliver an effective and balanced portfolio of energy and demand savings opportunities across all customer segments to meet the Company's objectives defined in the Executive Summary. Each program was designed to leverage the optimal mix of best-practice measures and technologies, delivery strategies, and target markets in order to most effectively deliver programs and measures to the Company's customers. Within the residential and business programs, we propose two online educational programs.

Cost Recovery Mechanism

For the cost recovery mechanism, the Company is proposing a DSIM structure that is consistent with KEEIA statute K.S.A. 2014 Supp. 66-1283. Below is the language within the statute regarding allowable cost recovery mechanisms:

> (d) (1) To comply with this section, the commission may allow cost recovery mechanisms that further encourage investments in demand-side programs. Such cost recovery mechanisms may include, but shall not be limited to: (A) Capitalization of investments in and expenditures for demand-side programs; (B) recovery of lost revenue associated with demand-side programs; (C) decoupling; (D) rate design modifications; (E) accelerated depreciation on demand-side investments; and (F) allowing the public utility to retain a portion of the net benefits of a demand-side program for its shareholders.

The DSIM structure that the Company is proposing includes timely, contemporaneous recovery of two components: program costs and the TD, plus an EO which would be recovered over a two-year period following final determination based on EM&V review in the year following the 36-month program period. The Company is requesting approval of a DSIM Rider to begin collecting 100 percent of forecasted program costs and 100 percent of the forecasted TD, which is directly attributable to the demand-side programs approved in this filing.

The DSIM Rider will be updated semi-annually with a reconciliation of the prior periods forecasted program costs and TD to calculated historical amounts with carrying costs on any under- or over-recovery. The TD recovery is also subject to retrospective EM&V review through adjustment of the EO. This is in addition to any future demand-side programs and tariffs that may potentially be filed under the KEEIA requirements for the program period, should that be contemplated. The Company also proposes to defer current recovery of unrecovered EE Rider costs from 2014-2016 to be recovered in the DSIM beginning in July 2017.

TRM

The Company's proposed TRM is a consolidated and interactive table containing all the key variables and assumptions necessary to characterize the measures for implementation, tracking, and evaluation purposes. The TRM document is available in Appendix D. Each measure characterization is populated with numerous parameters, based on the Company's default planning values.

The TRM is based on a Microsoft Excel file with interactive formulas to calculate savings, the formulas can be inspected and interrogated to observe how the default planning values are constructed and calculated. The TRM provides a transparent and intuitive central resource for implementers, trade allies, customers, regulators, planners, and evaluators to access the relevant measure characteristics and calculations. This allows easier access to the measure values so that projects can be planned, savings and incentives can be estimated, and processing and evaluation can be expedited.

Sources for the TRM include the Company's potential study, recent EM&V's from MEEIA Cycle 1 for GMO, and secondary sources.

Advisory Group

The Company proposes the establishment of an Advisory Group, which will consist of certain stakeholders[8] to KEEIA Cycle 1. The Advisory Group will be formed to allow for collaborative input on the design, implementation, and review of DSM programs. We recommend that the Advisory Group meet twice a year to review portfolio status, EM&V progress, and savings progress.

EM&V

Programs offered by the utility must provide for demand-side savings from programs that are cost-effective, measurable and verifiable. To comply with this portion of the KEEIA statute, the Company proposes a rigorous EM&V process. Ongoing analysis of program performance through EM&V is an important aspect to that end. Approximately, but not more than, five percent of the three-year KEEIA Cycle 1 program portfolio budget, will be spent for EM&V. The Company will work with the Advisory Group to develop an evaluation plan to determine how best to allocate and utilize the EM&V budget.

The plan will address three main areas: process evaluation, impact evaluation and cost-effectiveness. We propose that the EM&V reports will be completed twice during the proposed three-year cycle, or every 18 months. The EM&V is a critical piece in this process as the results of the EM&V will be utilized to update the deemed measure values in the TRM, utilized in the TD true-up, and the resulting NTG ratios will be applied to the EO.

A detailed EM&V process is provided for in Appendix C.

Tracking and Reporting

Consistent with the requirements of the KEEIA statute, the Company will provide an annual report to the Commission on or before May 31 of each year describing the results of the DSM programs for the previous calendar year. The report will include:

(1) program expenditures, including incentive payments;

(2) peak demand and energy savings impacts and the techniques used to estimate such impacts;

(3) avoided costs and the techniques used to estimate such costs;

(4) the estimated cost-effectiveness of the demand-side programs;

(5) the net economic benefits of the demand-side programs; and

(6) a comparison of the commission authorized program budget to actual costs.

While this report to the Commission is a requirement of the KEEIA statute, the Company will apprise stakeholders during the Advisory Group meetings of portfolio progress. The Company will also have a robust tracking mechanism in place to track participation, energy and demand savings and program costs.

[8] Staff, Citizens' Utility Ratepayer Board (CURB) and other potential stakeholders such as environmental groups.

D. Collaborative Process to Approval

Schedule

Without further action by the Company and the Commission, KCP&L's remaining six DSM pilot programs currently in effect in Kansas will expire December 31, 2016. These programs include:

- Income-Eligible Weatherization;
- Programmable Thermostat;
- Residential and Commercial / Industrial (C&I) Energy Analyzer;
- Building Operator Certification; and
- Demand Response Incentive.

The Company is proposing KEEIA Cycle 1 programs replace the existing programs and become effective January 1, 2017 through December 31, 2019 such that there is a continuous offering of DSM programs between the pilot programs and KEEIA Cycle 1.

Although the existing Kansas program offerings are minimal, the Company has prior experience with ending programs and with ramping programs down and back up again, and has found that doing so can result in strained vendor relationships and can cause customer confusion. It is difficult to communicate the regulatory process to customers and other stakeholders, and it can be administratively burdensome. The Company's goal in the proposed schedule is to minimize program interruption, avoid confusion and maintain positive relationships with all stakeholders and customers.

This filing is timed to fit the Company's intention to have the KEEIA Cycle 1 tariffs effective on January 1, 2017 such that the Company can meet its obligations to customers and stakeholders and provide a seamless transition from the current pilot programs to KEEIA Cycle 1. In order to accomplish this, the Company proposes a series of technical conferences to educate and collaborate with stakeholders on portfolio program design, a cost recovery mechanism and other key topics. A detailed proposed schedule is outlined in Section 6.

Alignment of Statute / Stakeholders / Utility

With guidance from the KEEIA statute, the overarching intent of the Company's filing is to show that DSM is a priority, important to the region and in everyone's (customer, community, stakeholders and Company) best interest. The Company intends to show how the proposed plan designs and outlines an implementation plan that will do the following:

Meet the KEEIA statute's intent by:

- Promoting DSM programs in such a way that all customers benefit whether participating or not; and
- Treat DSM investments similar to supply-side investments with a proposal for a DSIM that addresses the three cost/financial components that allows for equal treatment of supply-side and demand-side investments.

Work with stakeholders to achieve objectives such as:

- Ensure that all customers can participate and benefit from the programs;
- Ensure customers are not unduly burdened by utility investments in DSM;
- Achieve high levels of DSM and bring Kansas more in line with nationwide EE gains;
- Develop programs and target sectors based on best practices;
- Provide opportunities for customers to invest in DSM to make their businesses more efficient;

- Allow for comprehensive opportunities to invest in DSM while improving appropriate levels of spend;
- Provide a clear, achievable business plan of DSM investments that is fair to customers and meets objectives of stakeholders; and
- Provide demand-side energy solutions that customers value while providing revenue opportunities equal to supply-side investments.

To facilitate and allow the Company to accomplish all of the above, the Company requests the Commission support the state policy by:

1. Providing timely cost recovery;
2. Ensuring that utility financial incentives are aligned with helping customers use energy more efficiently and in a manner that sustains utility customers' incentives to use energy more efficiently; and
3. Providing timely EOs associated with cost-effective, measurable and verifiable savings.

SECTION 2

Benefits of DSM Programs

There are four beneficiaries of DSM programs: our customers, the local economy, the Company, and the environment. The Company is requesting to invest in its residential and business customers so that they may use electricity more effectively, which produces numerous direct and indirect benefits. The benefits of DSM extend well beyond lowering energy bills for customers. DSM also favorably impacts the economy and environment. The Kansas economy is impacted in a highly positive way by the successful promotion and execution of DSM programs that the Company has previously implemented and is now proposing to expand. In addition, the environment is benefited by the reduction in emissions resulting from reduced electricity usage.

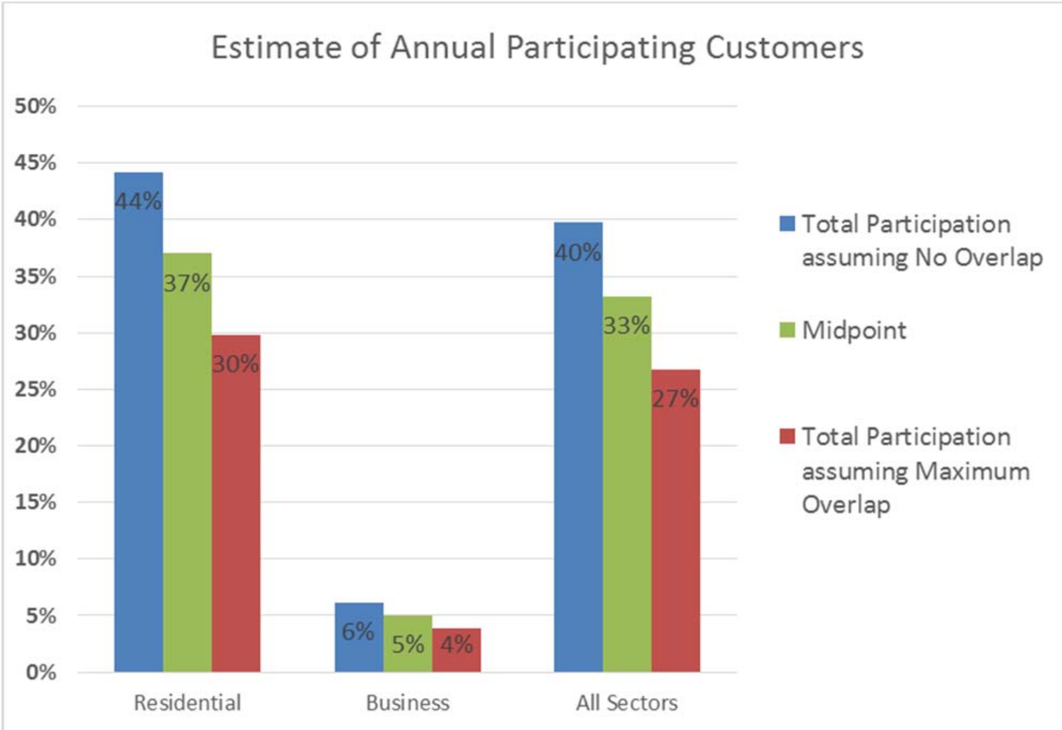
The sections below describe these benefits that support the Company's proposed plan.

A. Customer Benefits and Participation

The Company considers engaging customers with their energy use as a key driver to a positive relationship with their electric utility. Historically, our customers have shown an increasing appetite for DSM programs, which has been supported by an increase in participation and favorable feedback.

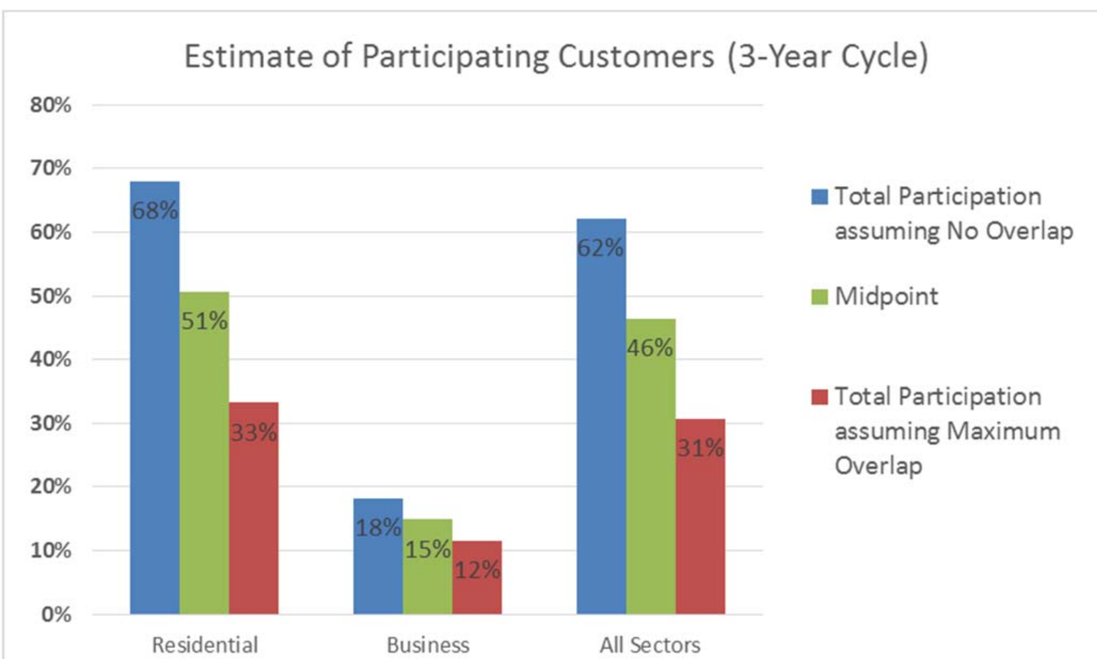
In Figure 2-1, we provide estimates of the annual participation in the DSM programs as a percent of total customers for the residential, business, and combined portfolios. Since we are tracking participation across a diverse set of programs, some of which are implemented upstream with limited knowledge of the ultimate customer, we provide a range of estimates. The high estimate is the annual total participation for all programs, which would assume no overlap of programs. The low estimate is simply the participation in the farthest reaching program (Home Energy Reports (HERs) for Residential, and Standard Rebate Program for Business), which assumes the maximum overlap where all programs are servicing the same subset of customers. The actual participation will be somewhere in between, so we also provide a simple midpoint average.

Figure 2-1 Forecasted Annual KEEIA Cycle 1 Participation



In Figure 2-2, the same exercise is performed for the cumulative effects of the three-year planning cycle. Some values here are greater than 100 percent, implying that some customers are being served multiple times.

Figure 2-2 Forecasted Three-Year Cumulative KEEIA Cycle 1 Participation



Annual participation by program is presented in Table 2-1. Each program has its own unique way of most appropriately representing participation, most of which correspond relatively well to a per-customer basis. For example, the Small Business Direct Install (SBDI) program is based upon the number of customers, but the Block Bidding program is based upon the number of Requests for Proposals (RFPs) issued within a year.

Table 2-1 Forecasted KEEIA Cycle 1 Participation by Program

Program	Unit of Participation	2017	2018	2019
Home Lighting Rebate	Households	12,500	30,000	30,000
Home Energy Report	Households	65,000	65,000	65,000
Whole House Efficiency	Households	1,200	1,800	2,200
Income-Eligible Multi-Family	Households	50	100	150
Income-Eligible Weatherization	Households	25	25	25
Residential Programmable Thermostat	Households	5,333	5,333	5,334
Business Energy Efficiency Rebate - Standard	Projects	1,068	1,120	1,172
Business Energy Efficiency Rebate - Custom	Projects	250	600	800
Strategic Energy Management	Customers in Cohort	4	4	4
Block Bidding	RFPs	1	1	1
Small Business Direct Install	Customers	50	85	100
Demand Response Incentive	Customers	11	46	53

** Assuming an average of six bulbs per participating household for Home Lighting Rebate program*

It is important to note that the Company is proposing that approximately 30 percent, or 65,000 customers out of approximately 220,000 residential customers in our Kansas territory receive HERs, and 100 percent of our Kansas customers have access to our Online Home Energy Analysis program. Approximately 21,700 small business customers also have access to the Online Business Energy Audit program. The online energy analysis programs recommend other DSM programs to participating customers, which only increases awareness of our portfolio of programs.

The Company's residential customers' level of satisfaction is a key driver to the program's success and overall positive interactions with the customer. The Company designed the DSM portfolio and enhanced the participation entry points such that customers have low barriers to entry and can learn about how their actions can positively impact their electric bills. The Company expects participation in the KEEIA Cycle 1 programs to have repeat participants from the Comprehensive Energy Plan era, as well as many new participants. A strong customer education component is necessary as well to drive behavior change and participation in our programs.

Customer Education

Providing customers information and insight about their energy use is a primary objective of the Company as we aim to continue to be the trusted energy advisor to the marketplace. There are several known strategies to help affect customers' behavior regarding energy while keeping in mind an annual study by Accenture[1] that has consistently found that the average utility customer

[1] The New Energy Consumer Balancing Strategic and Operational Imperatives, Reference Guide 2.0, Accenture, May 16, 2012.

spends just nine minutes per year thinking about energy usage. Unless the Company increases or deepens the importance of these minutes, customers are not likely to engage in DSM programs or take action to reduce their usage.

Residential behavior-based EE is a large and untapped source of energy savings for both utilities and their customers. Past studies have shown that consumers change how they use energy when they receive relevant insights about their energy use in a format that provokes their interest and action. Well-designed feedback on energy use combined with personalized recommendations, in addition to energy savings, educates households by increasing awareness of energy usage and opportunities for conservation—through both changes in behavior and the purchase of energy efficient products.

Industry leaders have created online educational tools that provide customers instant access to online energy feedback information, along with the ability to perform a home energy audit, access energy savings tips, monitor usage over time, compare usage to neighbors for benchmarking purposes, and make more informed energy decisions. KCP&L intends to provide these tools to our customers via our Analyzer program, which follows an opt-in model in which customers must actively choose to participate. As customers access and use the program, they will receive information that puts their energy usage in context as well as salient, personalized advice highlighting opportunities to use less energy and save money.

The goals for the Analyzer program include increasing customer awareness of their energy usage, making customers more informed of KCP&L's DSM program offerings and other energy savings opportunities, and, over time, driving increased participation in installed measure programs while reducing the marketing costs associated with other programs.

Another example of a program that is effective in accomplishing customer engagement is KCP&L's HER program that we have had in place in our GMO service territory for nearly two and a half years with 57,000 customers, and in our KCP&L-MO service territory for over 18 months with 110,000 customers. The HER program in GMO will be expanded by 75,000 customers in 2016-2018 such that GMO will be reaching 132,000 customers with this program. As mentioned above, we are proposing the HER program be offered to approximately 65,000 Kansas customers during KEEIA Cycle 1. One of the primary purposes of the HER program is to deepen customer understanding of their energy consumption. Consumers change how they use energy when they receive relevant insights about their energy use in a format that provokes their interest and actions. To accomplish this, HERs contextualize each customer's energy usage by informing them of how their energy use compares to that of similar homes. Behavioral science research has demonstrated that peer-based comparisons are highly motivating ways to present information.[2] The utility bill can tell a customer how much energy they used (in kWh) and how much they are being charged; however, customers need additional personalized context in order to more fully understand and make better decisions regarding their usage. The reports can also display a customer's usage over time and allow customers to understand how seasonality can impact their use, as well as provide customers with individually targeted savings tips based on energy usage patterns, housing characteristics, and demographics.

HER programs also increase the frequency with which customers think about their energy usage. Customers primarily think about their energy use during discrete times, such as when they receive their monthly bill (particularly if it is a high bill), when they move to a new home, and when an outage occurs. Therefore it is fair to assume that most, if not all, of the nine minutes spent thinking about energy usage occur during these times and are negative and/or stressful experiences. HERs, which are sent separate from the utility bill, create a new touch point for

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[2] For a discussion of the power of normative comparisons relative to economic, civic, or environmental persuasive appeals, see: Cialdini, Robert, and Wesley Schultz, 2004, "Understanding and Motivating Energy Conservation via Social Norms," *Arizona State and California State Universities*: http://opower.com/uploads/library/file/2/understanding_and_motivating_energy_conservation_via_social_norms.pdf

utilities to communicate with customers and increase the time customers spend thinking about their consumption. Data from HER deployments throughout the country have shown that customers are indeed spending time with the reports. For example, in a survey of over 10,000 customers across 12 utilities, 72 percent read their reports and 31 percent shared their reports with others, such as their family and friends. This means that HERs are increasing the amount of time recipients and non-recipients think about their energy use, creating a spillover effect that can influence even more customers. We have provided an example of a HER in Appendix K.

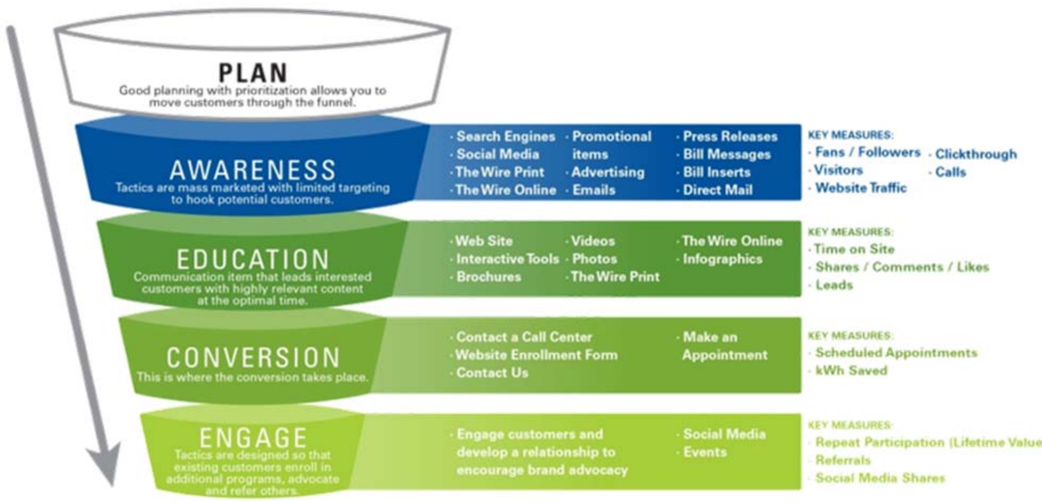
In 2015, the Company also made the strategic decision to marry the HER with an online home energy audit program. The Company is proposing to offer the HER and the Online Home Energy Audit program with the same implementer such that a customer is able to receive the report, review their usage, and carry through with an additional step to perform an online energy audit. The online energy audit will provide the customer with instantaneous recommendations and suggestions based on their specific usage characteristics, appliances within their home, and physical characteristics of their home. The Online Home Energy Audit program will provide recommendations on other programs that the Company offers, driving further increases in program participation.

The Company will continue to work with the marketplace to find other ways to continue engaging customers digitally with their energy usage, including but not limited to gamification, competitions and micro targeting.

Promotion of DSM as Win-Win

General awareness of the Company programs is another cornerstone building block to help move customers along the path to increased engagement. Examples of tactics to enhance awareness and move customers along the funnel, shown in Figure 2-3, are listed in the program descriptions in Appendix A.

Figure 2-3 Example of Marketing Funnel



B. Local Economic Benefits – Jobs and Investment

Overall, economic activity and jobs are increased by the availability and promotion of DSM programs in the Company's service territories. According to a recent report released by Clean

Energy Trust and Environmental Entrepreneurs (E2), nearly 570,000 people work in clean energy throughout the Midwest.[3] The report states that this number is expected to grow by more than 4 percent over the next year. Implementation of DSM programs, such as through KEEIA, will help support that grown.

Energy efficiency jobs account for the largest percent of those 570,000 jobs, or 75 percent. Other clean energy jobs include those in the clean fuels industry, advanced transportation, advanced grid, and renewable energy. American Coalition on Energy Efficient Economy (ACEEE), every one million dollars invested in EE supports approximately 17 direct and indirect jobs.[4]

Trade Allies, Implementers, Economic Activity

Economic Activity: Trade allies, consisting of a multitude of contractors in both of the residential, commercial and industrial (C&I) sectors, are positively impacted by the Company's DSM portfolio by offering additional incentives for customers to more efficiently use energy. In essence, the programs can help spur demand for contractors to promote existing and new technologies that would benefit customers.

According to Tom Hurley, Voss Lighting Kansas City Branch Manager,

> *...the [MEEIA] Program has opened the door for new business; it is an integral part of our proposals and our success. We have at least 1.5 additional staff as a result. We are a 6 million dollar branch and I guarantee that at least 15% of our business is a direct result of the Program.*

The Company collaborates with selected implementers to have as much local presence as possible to execute the delivery of the Company's DSM programs. These jobs range from transactional to promotional to engineering to management. The responsibilities of implementers are discussed in more detail in Section 3C.

For MEEIA Cycle 2, the Company is contracting with implementers that employ full-time equivalent employees (FTEs) in the Kansas City metro area. Table 2-2 represents the approximate number of FTEs that were hired directly to support our MEEIA Cycle 2 programs locally. The Company underwent a robust Request for Proposal (RFP) process in 2015 to solicit bids from the market for implementer services for MEEIA Cycle 2. The selected implementer group is shown in Table 2-2.[5] This same group of implementers is expected to support KEEIA Cycle 1 so that we can expand on existing synergies and knowledge of our programs, customers, and trade allies. In addition, if KEEIA Cycle 1 is approved, KCP&L anticipates additional jobs will be created externally with implementers and trade allies to further support outreach to customers in Kansas with the larger portfolio.

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[3] http://www.cleanjobsmidwest.com/

[4] http://aceee.org/blog/2012/09/energy-efficiency-and-economic-opport

[5] In addition, the Company anticipates using the selected MEEIA Cycle 2 evaluator (Navigant) for the EM&V process in KEEIA Cycle 1, as well as using the same tracking mechanism as MEEIA Cycle 2, which is supported by Nexant.

Table 2-2 Implementer Local FTEs Supporting MEEIA Cycle 2

Program	Implementer	FTE (local)
Business Rebate Programs and Demand Response Incentive, Small Business Direct Install, Strategic Energy Management, Block Bidding	CLEAResult	19
Programmable Thermostat	Nest	5
Income Eligible Multi-family, Whole House Efficiency, Home Lighting Programs	ICF International	10
	Total	**34**

In addition, the Company currently has 12.5 FTEs that support DSM programs offered for MEEIA and the existing Kansas pilot programs. The positions at the Company are filled by highly skilled program managers, analysts, marketing and accounting personnel. If KEEIA Cycle 1 is approved, the Company anticipates 4.5 additional employees will be needed to further support our proposed expansion of DSM in Kansas. Further discussion of proposed accounting treatment for these additional employees hired to directly support KEEIA Cycle 1 is discussed in Appendix E.

C. Cost-Effectiveness – Systematic Quantification of Benefits

Customer Benefits (Participants and Non-Participants)

As a function of the KEEIA legislation, the Company is meeting the requirement of benefiting not only all customers participating in the DSM programs, but also those not participating in the programs. This is accomplished by finding a balanced and optimized portfolio approach with respect to the relevant benefit-cost tests. There are four industry standard cost-effectiveness tests to gauge the economic merits of DSM measures and programs. These tests were addressed and endorsed by the Commission in Docket No. 08-GIMX-442-GIV.[6] Each test compares the benefits of the DSM activities to their costs – using the test's own unique perspectives and definitions – all defined in terms of NPV of future cash flows. Three of the four tests directly consider ways in which the customer is affected, as described below.

- **TRC Test** focuses on the economic impact of the DSM activities to society as a whole. The benefits are the avoided utility energy and capacity costs. The costs are the incremental costs of end-use measures implemented due to the program, including both customer and utility costs, plus the utility costs to administer, deliver and evaluate the program. Since the TRC ratio is greater than 1.0, the portfolio delivers more economic benefit to all the Company ratepayers (including participants and non-participants) than the total cost of the programs.
- A variation of the TRC test is the **Societal Cost Test (SCT)**. This metric differs from the standard TRC test in that other environmental benefits are included in the numerator of the benefit-cost (B/C) ratio and a societal discount rate is used.
- **Participant Cost Test (PCT)**. The benefits are the lifetime value of retail energy savings accrued by participating customers. The costs are those seen by the participant; in other words, the incremental measure costs minus the value of utility incentives paid

[6] See Docket No. 08-GIMX-442-GIV, *Order Setting Energy Efficiency Policy Goals, Determining a Benefit-Cost Test Framework, and Engaging a Collaborative Process to Develop Benefit-Cost Test Technical Matters and an Evaluation, Measurement, and Verification Scheme*, issued Jun. 2, 2008, p. 15, ¶38; and *Order Following Collaborative on Benefit-Cost Testing and Evaluation, Measurement, and Verification*, issued Apr. 13, 2009, p. 13, ¶37.

out to them. The Company value for this B/C ratio is significantly higher than 1.0, showing that participants overwhelmingly benefit from the programs.

- **Rate Impact Measure (RIM)** quantifies the difference between the change in utility revenues and the change in costs incurred by utility for implementing the DSM portfolio. The RIM test attempts to show the effect of the DSM portfolio on customer rates. The benefits are the same as the TRC benefits, avoided utility energy and capacity costs, while the costs are the total cost of running the DSM programs (incentive and non-incentive costs) plus any lost revenue from the decreased purchases of energy.

  DSM portfolios almost always raise rates on a *per unit* basis (that is, the RIM ratio is less than 1.0 for the vast majority of DSM portfolios). Thus, costs typically outweigh benefits from the point of view of this test, but if the *absolute* energy use decreases to a greater extent than *per-unit* rates are increased over time — the TRC test will be greater than 1.0 and lower average utility bills will result. The Company's programs have a relatively high RIM ratio since the portfolio is very cost-efficient and has a strategic focus on peak demand and capacity savings. These savings provide targeted benefits such that economic system benefits are captured while significant lost revenues from decreased energy sales are not incurred.

- A variation of the RIM test is called the **RIM Net Fuel Test**. This metric differs from the standard RIM test in that it does not include base fuel or fuel adjustment costs in the lost revenue calculation. This is because base fuel and fuel adjustment costs can be considered a pass-through cost to customers rather than utility revenue. The RIM Net Fuel test does include avoided fuel purchases in the lost revenue that is part of the denominator or cost portion of the metric, and therefore, the RIM Net Fuel test will result in higher net benefits than the standard RIM test.

The Company strives to have programs available to all who want to participate, but fully expects that some will not participate for a myriad of reasons related to their individual situations. Viewing the programs through the lenses of the cost-effectiveness metrics above allows all customers to understand that the Company's DSM investment is beneficial to them.

DSM as a Long-Term Resource in a Balanced Portfolio

The Company evaluates resource needs for KCP&L holistically for its Kansas and Missouri service territories. Through its corporate planning process, the Company has modeled 10 different alternative resource plans with multiple levels of DSM (including a plan with no DSM) and renewable energy. Various resource and plant retirement options were also evaluated. The Company's primary consideration in selecting the preferred plan is least-cost net present value revenue requirement (NPVRR) over a 20-year planning period. The outcome of the corporate planning process resulted in a demonstrably sustainable plan to implement DSM programs in the short- and long-term, and provides the most value to our customers.

The Company views DSM as a long-term resource amongst a balanced portfolio. By investing in customers using electricity more efficiently, the choice of generation type asset becomes ultimately more effective. Consideration of the **Utility Cost Test (UCT)**, ensures that this perspective is also included in the program and portfolio design.

- **UCT**. The benefits are the avoided utility energy and capacity costs, which are the same as the TRC test and RIM test benefits. The costs are the program administrator's incentive costs and administrative costs (a utility's costs to administer, deliver and evaluate the program). A more positive B/C ratio indicates the portfolio's relative fitness when compared to alternative, supply-side options that the Company may consider in long-term, integrated resource planning.

The portfolio-level cost-effectiveness results are presented in Table 1-2 and more detailed, program-level results are available in Table 3-7.

D. Environmental Benefits Now and Future Possible Avoidance

The benefits to the environment related to investments in DSM can easily be seen in the reduction of emissions related to the generation of electricity. Any kilowatt-hours not used by customers because of efficiency equate to reductions in kilowatt-hours and emissions generated at the power plant.

A potential future benefit related to the environment is the possible cost avoidance of compliance with future federal or state regulations related to the Clean Power Plan or other similar initiatives. For example, a reduced carbon footprint from DSM programs may defer or eliminate the need to build and finance chemical scrubbers, ultimately depending on the outcome of future generation resource planning.

The DSM programs, while targeting electricity savings in the Company's service territory, also provide corollary benefits for non-electric consumption, such as water savings and natural gas savings, as well as spillover effects on conservation that benefits neighboring jurisdictions. An example of co-benefits from water savings would be if low-flow fixtures are installed to reduce the consumption of electric water heaters and they also reduce the corresponding water consumption. Natural gas savings would accrue any time building shell improvements are made in a facility that uses natural gas for a portion of its space conditioning needs. An example of spillover effects would be if a customer in a nearby jurisdiction was motivated to install a high efficiency heating, ventilating, and air conditioning (HVAC) system after learning about the options and long-term benefits from Company marketing or educational efforts. None of these examples are quantified in the Company's plans, but all are real and tangible effects that are worth keeping in mind when considering high level strategy and policy.[7]

[7] Company DSM program evaluations do attempt to quantify estimates of both spillover and free-ridership for electricity savings.

SECTION | 3

DSM Experience to Date and Proposed Portfolio

The Company has a history of implementing DSM programs, beginning most significantly with the Comprehensive Energy Plan adopted in 2005 in KCP&L's Kansas and Missouri jurisdictions, as well as in its GMO service territory. Prior to that, the Company implemented various demand reduction and pricing programs throughout the 1990s. Since the conclusion of the Comprehensive Energy Plan, the Company continued programs in both Kansas and Missouri; however, it expanded its portfolio in Missouri following the MEEIA legislation adopted in 2009, and now proposes to expand its DSM portfolio in Kansas under KEEIA. With the recent introduction of the KEEIA in Kansas, the Company now seeks to ramp-up demand-side programs in Kansas that are more in line with the programs offered to its customers in Missouri as a result of the MEEIA.

The MEEIA construct is based not only on a legislative statute similar to KEEIA, but also incorporates rules that were developed through a collaborative process by utilities and stakeholders in Missouri. We may reference these rules throughout this Report to reinforce the rigor that the Company must follow for successful delivery of programs.

The sections below describe our historical experience and success with DSM implementation. We describe how our experience has not only increased our knowledge of customers, but has also led to effective program delivery and prudent program management. We also present an overview description of our proposed portfolio.

A. Successful Delivery of Programs

DSM programs began in 2005 in Kansas as a result of the Stipulation and Agreement in Docket No. 04-KCPE-1025-GIE (04-1025 S&A) and in Missouri, Case No. EO-2005-0329 (0329 S&A), both of which established the Comprehensive Energy Plans for the respective States. At that time, the portfolio of programs established within the Comprehensive Energy Plan in each state represented a significant commitment on the part of KCP&L to promote DSM to ensure that all classes of customers had programs in which they could participate. This commitment to DSM by a Kansas or Missouri utility was unprecedented at the time of the 04-1025 S&A and the 0329 S&A. The Company remained committed to these programs even after the conclusion of the 04-1025 S&A and 0329 S&A and the original $53 million Comprehensive Energy Plan commitment in its KCP&L-KS and KCP&L-MO service territories (the Kansas jurisdictional share of this amount was approximately $24 million).

After passage of the MEEIA in 2009, the MPSC approved a suite of demand-side programs for the GMO service territory on January 27, 2013. This portfolio concluded on December 31, 2015. The Company also launched programs in its KCP&L-MO service territory under MEEIA on July 6, 2014. This portfolio was approved for 18 months and also ended on December 31, 2015. Through December 31, 2015, for the entirety of its DSM commitment, the Company has invested $71.3 million in GMO and $94.2 million in KCP&L-MO during its MEEIA Cycle 1.

Following the Comprehensive Energy Plan period in Kansas, KCP&L made attempts to expand its portfolio; however, competing interests among various parties and inadequate cost recovery resulted in a reduced rather than enhanced DSM program portfolio. Even so, through December 31, 2015, KCP&L has invested a total of $36.5 million in DSM in Kansas. With the passage of the KEEIA in 2014, KCP&L began planning for an expanded suite of demand-side programs in its Kansas service territory. The result of that planning is this KEEIA Cycle 1 filing.

Table 3-1 below summarizes the Company's achievements in offering DSM programs since 2005 through December 2015.

Table 3-1 KCP&L and GMO Historic DSM Program Summary (2005 - December 31, 2015)

	Annual Energy Savings (MWh)	Peak Demand Savings (MW)	Portfolio Investment ($)
KCP&L-KS			
DSM	81,809	64.3	$ 36,511,345
Total KCP&L-KS	81,809	64.3	$ 36,511,345
KCP&L-MO			
Pre-MEEIA	183,045	109.4	$ 67,343,349
MEEIA Cycle 1	126,127	42.7	$ 26,840,140
Total KCP&L-MO	309,172	152.1	$ 94,183,489
GMO			
Pre-MEEIA	85,499	50.2	$ 26,276,088
MEEIA Cycle 1	145,132	75.0	$ 45,004,795
Total GMO	230,631	125.2	$ 71,280,883
Total Company			
Total	**621,612**	**341.6**	**$ 201,734,030**

The MPSC recently approved MEEIA Cycle 2 for GMO and KCP&L-MO. MEEIA Cycle 2 begins on April 1, 2016 and concludes after 36 months on March 31, 2019.

Comprehensive Energy Plan Highlights

While the focus of this filing is programs under the KEEIA construct, the Company has been working diligently to provide customers options for DSM programs for over ten years. A few program highlights of those efforts as a function of KCP&L's Comprehensive Energy Plan in Kansas and Missouri are listed here for reference:

- Innovative thermostat DR program that grew to largest in region at the conclusion of the Comprehensive Energy Plan.
- Increased the participation of C&I DR program by 20 fold in a little over a year ending with over 50 MW of capacity system-wide.
- Partnered with the local gas utility to co-deliver a comprehensive Home Performance with ENERGY STAR® program in Missouri.
- Built a strong local HVAC contractor base that demonstrated increased close rates on HVAC sales significantly by having the Company rebate to overcome the barrier to investing in efficiency.

As a result of the programs during the 2005-2009 Comprehensive Energy Plan timeframe, the Company's investments in Kansas and Missouri:

- Created 115 MW of resource capacity;
    - Generated $80 million of local and national economic activity, including the creation of over 70 new jobs (60 within the Kansas City metropolitan area); and
- Reduced carbon dioxide (CO_2) emissions equivalent to the removal of nearly 7,000 cars from the road.

EM&V Studies

The Company has completed over 20 EM&V studies since 2005 for implemented DSM programs with overwhelmingly positive results. EM&V reports demonstrate the value of DSM programs by providing accurate, transparent assessments of their methods and performance. Impact evaluation estimates the quantitative effects of DSM programs. Process evaluation analyzes program design and implementation and can recommend cessation of unsuccessful programs. Opinion Dynamics Corporation (ODC) reviewed both the GMO and KCP&L C&I EE Rebate programs in 2010 and 2008, respectively.[1] For KCP&L, ODC reported a 114 percent gross realization rate for energy savings and a 119 percent gross realization rate for demand reduction for custom projects.

Portfolio Implementation Framework

Successful implementation of a portfolio typically requires a combination of tactics to ensure potential customers and program partners are aware of the programs and that the Company and its implementers take steps to reduce and manage risk, as well as address free ridership and spillover associated with the programs and portfolio. The tactics successfully deployed by KCP&L in Missouri and that will be utilized in Kansas are described in detail below.

Trade Ally Network

Trade allies are contractors, engineers, or program partners who have registered with a utility DSM program and are executing EE or DR initiatives in cooperation with the utility program. Developing an educated and quality trade ally network is a key element to transforming the marketplace. The Company has developed a successful network of trade allies that deliver existing DSM programs to date and is taking steps to further expand the effectiveness of this network moving forward.

Trade allies are often the first point of contact for a customer in need of new equipment and/or systems. For example, a residential customer who is in need of HVAC equipment will likely contact their HVAC contractor (trade ally) first to resolve the issue. This demonstrates that trade allies have a unique, and sometimes first, opportunity to make customers aware of Company DSM programs and educate the customer on the benefits of energy efficient equipment and/or systems. Therefore, the Company has made it a priority to establish a strong trade ally network with our DSM business programs.

Within our MEEIA Cycle 1 business rebate program, the Company's implementer had three FTEs assigned to outreach and to interact exclusively with trade allies and this number will increase for Cycle 2. This arm of the implementation team, the implementer trade ally team, executed over 1,000 trade ally meetings with the trade network since January 2015 and collaborates closely with the Company's program managers to ensure the best possible combination of customer and trade ally experience. The majority of the trade allies serve the entire metro area so it is anticipated that there will be a great deal of synergy to expand that value to Kansas as well.

Our experience with MEEIA Cycle 1 and feedback from our implementers reinforce that the trade ally network is pivotal to the success of the Company's business rebate program and achieving savings targets. The implementer trade ally team employs a three-pronged approach to connect with potential allies through trusted organizations. Examples include the Association of Energy Engineers, and the Building Operator Maintenance Association. In addition, the implementer trade ally team supports the Company in such venues as delivering informational presentations, staffing booths at organization conferences, and providing input to articles that are provided through the Company's newsletter to trade allies and large customers.

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[1] GMO Case No. EO-2012-0009 and KCP&L Case No. EO-2012-0008.

Second, the implementer trade ally team collaborates with local equipment distributors where energy efficient equipment is often specified and purchased in order to introduce another opportunity to connect with installing contractors. These distributors often host “lunch and learn” meetings where the outreach team educates contractors about program participation.

Third, the implementer trade ally team’s daily routine focuses on one-on-one meetings with trade allies to educate them on the Company’s programs, assist them in submitting complete applications to streamline the approval process, and be the trade allies’ overall internal advocate to bring projects to completion. These opportunities provide the base framework that additional communication points, such as email announcements and large scale forums, build.

To further highlight the benefits of a trade ally-utility partnership, the Company has offered larger scale meetings with its trade allies and provided awards to and public recognition of these trade allies. For example, in September 2014, the Company hosted an EE Forum with nearly 300 trade allies and business customers in attendance. Additionally, many manufacturers, several of whom are also active trade allies, sponsored booths to educate attendees on their latest equipment or technology. The Company also collaborated with multiple subject matter experts who presented training sessions on topics such as advanced light-emitting diode (LED) lighting, Property Assessed Clean Energy financing, air compressor usage and building automation. Furthermore, three outstanding projects and a platinum sponsorship manufacturer/local trade ally were honored for their contributions to the Company’s continued program success. The event was highly successful, much praised, and requested by the market as an annual event.

Additionally, in July 2015, the Company hosted a trade ally exclusive forum with over 100 total trade allies. The roundtable session in both meetings included exceptional trade ally interaction and conversation. Ultimately, the overall event produced positive trade ally feedback and interest in future events.

Outreach, Marketing and Communications

Outreach, marketing and communications are a critical mechanism for ensuring customers and trade allies are aware of, and participate in, the portfolio of programs. A portion of the education and marketing budget from each individual DSM program is directed toward coordinating the overall strategy in a concerted way that reinforces the KCP&L DSM brand. More detail about the Company’s marketing approach is outlined in Section 4E.

Portfolio Risk Management

The DSM portfolio incorporates multiple strategies to manage risk, including:

- Diversification of offerings among multiple programs and customer groups.
- Employing a rigorous RFP and performance-contracting process to select and appropriately guide implementers.
- Utilizing program tracking software based tools to allow real-time insight into trends and program adaptability to changing market conditions.
- Minimization of free ridership and maximization of spillover by using proven, best practice measures, program delivery mechanisms, etc.
- Periodic evaluations, incorporating resulting recommendations for process improvements as they are received.

Other program-specific elements of risk management are provided in the program detail later in this report.

Minimize NTG Impacts

A key tactic of successful implementation includes minimizing the NTG ratio for each program. NTG ratios adjust the gross energy and demand savings associated with a program to reflect the overall effectiveness of the program, taking into account free riders, participant spillover, and non-participant spillover. The NTG ratio is defined as:

NTG Ratio = 1 – FR rate + PSO rate + NPSO rate

Free riders, participant spillover and non-participant spillover, as determined from an impact evaluation, are defined as:

- Free Riders (FR): Customers who participate in EE programs that would have engaged in the efficient behavior in the absence of the program.
- Participant spillover (PSO): The additional energy savings that are achieved when a program participant—as a result of the program's influence—installs additional EE measures or practices outside the efficiency program after having participated in the program.
- Non-Participant spillover (NPSO): the additional energy savings that are achieved when a non-participant implements EE measures or practices as a result of the program's influence (for example, through exposure to the program) but is not accounted for in program savings.

Spillover acts in an opposing direction of free ridership. Spillover increases a program's energy and demand savings while free ridership diminishes a program's savings.

The Company will make an effort to minimize free ridership and maximize spillover by:

- Modifying incentives to respond to market prices, as needed and practical.
- Verifying customer eligibility to ensure the customer is a Company customer, as practical.
- Increasing marketing of the Company's DSM portfolio and educational tools, such as the Online Home and Business Energy Audit.

The Company's program adjustments to address free ridership and spillover will not be intended to negatively impact program implementation or continuity, and will adhere to program tariffs (*e.g.*, program managers will not modify incentive levels with a frequency that would compromise program stability and the customer experience).

In MEEIA Cycle 1, the Company utilized the EM&V annual results to incorporate changes to the programs such that the NTG improved. While in MEEIA Cycle 1 a final NTG is not determined until the conclusion of the three-year portfolio plan, the EM&V consultant (Navigant) shares results on a continual basis and provides a directional NTG so that the Company can improve year over year. As part of the impact evaluation, the EM&V consultant will also determine the ex post savings for each program. Ex post savings are evaluated savings as determined after the fact following the EM&V consultant review, as compared to the deemed (or ex ante) savings which were the estimated savings before the fact.

B. Detailed Descriptions of Programs

The KEEIA Cycle 1 DSM portfolio is comprised of seven residential programs and seven business programs that will deliver an effective and balanced portfolio of energy and demand savings opportunities across all customer segments. Each non-educational program was designed to leverage the optimal mix of best-practice measures and technologies, delivery strategies, and target markets in order to most effectively deliver programs and measures to the Company's customers. Both the Online Home Energy Audit and Online Business Energy Audit are educational programs.

The programs proposed for KCP&L's KEEIA Cycle 1 are listed with a brief description in Table 3-2 and Table 3-3 for residential and business customers, respectively.

Table 3-2 Proposed Residential DSM Program Descriptions

Residential DSM Programs	
Home Lighting Rebate	Instant incentives at qualifying retailers for LEDs.
Home Energy Report	Behavior program utilizing customized energy reports sent periodically to households.
Online Home Energy Audit	Online energy audit tool.
Whole House Efficiency	This program is comprised of three options. Option 1. Home Energy Audit and Direct Install of Kit Measures Option 2. Air Sealing, Insulation and Windows Option 3. HVAC Equipment
Income-Eligible Multi-Family	The program is comprised of two tiers: Tier 1. Home Kit Tier 2. Common Area Lighting
Income-Eligible Weatherization	The program is comprised of two tiers: Tier 1. Home Kit Tier 2. Weatherization
Residential Programmable Thermostat	Direct load control program that cycles and curtails central air conditioners by way of a remote-controlled switch. Achieves energy savings through learning thermostat as well.

Table 3-3 Proposed Business DSM Program Descriptions

Business DSM Programs	
Business Energy Efficiency Rebate – Standard	Customers may receive incentives by installing efficient measures from a pre-qualified list of options.
Business Energy Efficiency Rebate – Custom	Customers may receive incentives for non-prescriptive measures.
Strategic Energy Management	Provides energy education, technical assistance, and coaching for large C&I customers in order to drive behavioral change and transformation of the company culture.
Block Bidding	The utility purchases blocks of electricity savings by issuing a RFP to eligible customers and third-party suppliers, representing reduced electric usage from non-conventional projects that may not be eligible or appropriately incentivized to participate in other programs.
Online Business Energy Audit	Online energy audit tool.
Small Business Direct Install	Small business customers that typically do not have the staffing or financial resources to engage in EE activities receive targeted marketing and attractive incentives (70 percent of the full cost) for qualifying DSM measures.
Demand Response Incentive	Interruptible tariff program for customers that can reduce load by at least 25 kW during times of system peak congestion.

Residential Programs

The Company is proposing seven programs for its residential portfolio. Four of these programs are new for Kansas, and three are a continuation of existing programs. In addition, the Company is requesting approval to terminate three programs that have been frozen to new Kansas participants since 2011. The Company recommended and the Commission approved to freeze and ultimately terminate two residential programs - the Cool Homes Program (Schedule 13, also known as Schedule CHP) and the ENERGY STAR® New Homes Program (Schedule 14, also known as Schedule NH or ESNH); and one business program - Energy Audit and Energy Measures Rider (Schedule 9, also known as Schedule ER or the C&I Rebate Suite).[2]

Those programs that the Company is proposing to continue will have modifications in the delivery of the program and/or incentive range; however, the main elements of the programs will remain the same.

The following table summarizes the recommended changes to the residential portfolio:

Table 3-4 Program Recommendations for Residential DSM Portfolio

Continuing	Terminating	New
Online Home Energy Audit (previously Home Energy Analyzer)	Cool Homes Program	Home Lighting Rebate
Income-Eligible Weatherization	ENERGY STAR® New Homes Program	Home Energy Report
Residential Programmable Thermostat		Whole House Efficiency
		Income-Eligible Multi-Family

Below is a summary of each residential program and highlights of each. Detailed program descriptions are offered in Appendix A, consistent with requirements outlined in Docket No. 08-GIMX-441-GIV.

Continuing Residential Programs

Online Home Energy Audit. This program is the same as the Home Energy Analyzer; however, it has been renamed to more fully reflect the purpose of the tool for better customer recognition. This program is an educational program. There are no energy or demand savings claimed for it. Customers receiving the report can easily set goals and perform an audit through the online portal.

Income-Eligible Weatherization. This program has not been altered and the Company proposes to continue it consistent with the current program. The Company recently revisited this program with stakeholders. The Company was able to secure an agreement with the Kansas Housing Resources Corporation (KHRC) to act as the program administrator under the existing terms of the program tariff. The parties discussed and reviewed the new partner option and agreed that it offered a better opportunity to provide weatherization assistance to eligible customers in KCP&L's Kansas service territory.

[2] Dockets Nos. 11-KCPE-689-TAR, 11-KCPE-690-TAR and 11-KCPE-694-TAR, respectively.

Residential Programmable Thermostat. A significant change regarding this program includes our proposal to claim energy savings (in addition to demand savings) for the residential programmable thermostat program. During KEEIA Cycle 1 the proposed programmable thermostat program will largely concentrate on replacing existing thermostats that are becoming technologically obsolescent with learning thermostats.

Terminating Residential Programs

Cool Homes. The Company is recommending to terminate this program pursuant to the Commission's Orders in Docket No. 11-KCPE-689-TAR.[3]

ENERGY STAR® New Homes. The Company is recommending to terminate this program due to the low NTG that it has experienced in EM&V studies and pursuant to the Commission's Order in Docket No. 11-KCPE-690-TAR.[4]

New Residential Programs

Home Lighting Rebate. This program will be offered in participating retail outlets and LEDs will be discounted at the point of sale.

HERs. As described earlier in the Report, HERs is a behavioral tool utilized in the industry. It provides a paper report mailed to the home of selected participants. The HERs shows a neighbor comparison to promote EE among homeowners, as well as promotes the Company's EE programs within its portfolio.

Whole House Efficiency Program. The Whole House Efficiency Program is designed as a comprehensive program where the customer is presented with options to reduce energy costs, improve comfort, and promote better indoor quality. There are three options proposed for this program: (1) walk through audit with installation of measures from an EE kit by an independent auditor; (2) rebate for installation of windows and insulation, as well as air sealing; and (3) rebate for early replacement of an air conditioning unit for a more efficient unit, as well as a lower rebate for units that have failed and need to be replaced.

Income-Eligible Multi-Family Program. The Income-Eligible Multi-Family program is proposed to meet the needs of this traditionally underserved segment. It is designed with the "one stop shop" in mind such that the building owner can take advantage of both standard and custom measures.

These residential programs are further described in Appendix A. Appendix A also contains program budgets, participation levels, targeted energy and demand savings, and cost effectiveness ratios.

Business Programs

The Company is proposing seven programs in its business portfolio. Five of these programs are new for Kansas, and two are a continuation of existing programs. Those programs that the Company is proposing to continue will have modifications in the delivery of the program and/or incentive range; however, the main elements of the program will remain the same. One program, the Building Operator Certification program, will be terminated as a separate educational program, but the Company is proposing to offer it within the Business Rebate program as a marketing tool to engage business customers in our programs. In addition, as

[3] Docket No. 11-KCPE-689-TAR, *Order Granting Application to Modify Tariff,* issued Jun. 22, 2011, p. 4, Ordering ¶ A; and *Order Clarifying Order Granting Application to Modify Tariff*, issued Ju1. 13, 2011, p. 2, Ordering ¶ A.

[4] Docket No. 11-KCPE-690-TAR, *Order Granting Application to Modify Tariff*, issued Jun. 22, 2011, p. 4, Ordering ¶ A; and *Order Clarifying Order Granting Application to Modify Tariff*, issued Ju1. 13, 2011, p. 2-3, Ordering ¶ A.

mentioned above, the Company is requesting final termination of the Energy Audit and Energy Measures Rider.

The following table summarizes the recommended changes to the Company's business, or non-residential portfolio:

Table 3-5 Program Recommendations for Business DSM Portfolio

Continuing	Terminating	New
Online Business Energy Audit (previously Business Energy Analyzer)	Building Operator Certification	Business Standard Rebates
Demand Response Incentive	Energy Audit and Energy Measures Rider	Business Custom Rebates
		Strategic Energy Management
		Block Bidding
		Small Business Direct Install

Below is a summary of each business program and highlights of each. Detailed program descriptions are offered in Appendix A, consistent with requirements outlined in Docket No. 08-GIMX-441-GIV.

Continuing Business Programs

Online Business Energy Audit Tool. The Online Business Energy Audit Program is an educational program that informs customers of business energy consumption and methods to reduce energy usage. The Company will strategize ways to highlight the audit tool on the KCP&L website and increase customer engagement.

Demand Response Incentive (DRI). Similar to the historical MPower program (renamed Demand Response Incentive Rider in Docket No. 14-KCPE-042-TAR), the DRI program provides firm contractual arrangements with customers for periodic curtailments at times of system peak demand. Customers enter into a contract for a one-, three- or five-year term and receive a payment/bill credit based upon the curtailable load, the contract term and number of consecutive years under contract.

Terminating Business Programs

Building Operator Certification (BOC). The BOC program is a competency-based training and certification program for building operators, managers and consultants, offering improved job skills, and more comfortable and energy efficient facilities. The certification also provides a credential for professional development while offering employers a way to identify skilled operators.

As stated above, the Company is proposing to terminate the BOC program as a separate educational program; however, the Company is proposing to offer it within the Business Rebate program as a marketing tool to engage business customers in our programs. The Company will not seek demand and energy savings or an associated TD. This is similar to how it is being offered in MEEIA Cycle 2.

The BOC program has been offered as an educational program to Kansas business customers circa 2007. During this time period, there have been approximately 63 Kansas customers who have graduated from the program. However, participation has decreased over the past several years as the program has matured. There were two Kansas BOC participants in 2014 and one in 2015. Participation has generally been from office, industrial, and municipal government segments. While we feel it is important to continue to educate these customers on DSM, we propose to utilize that funding on programs that would benefit a broader segment of customers and realize greater energy savings.

Energy Audit and Energy Measures Rider. Similar to the new Standard and Custom Business rebate programs described below, the Energy Audit and Energy Measures Rider provided rebates to commercial and industrial customers on increasing energy efficiency in the building shell, installation of efficiency equipment in new construction or replacement of inefficient equipment. This program also provided a modest rebate for an energy audit. The Company froze this program in 2011 and is requesting final termination pursuant to the Commission's Order in Docket No. 11-KCPE-694-TAR;[5] however, a redesigned version is proposed with the inclusion of the new business programs defined below.

New Business Programs

Business Standard Rebates. The Business Standard Rebates program is designed to help commercial and industrial customers save energy through a broad range of energy efficiency options that address all major end uses and processes. The program will offer standard rebates as well as mid-stream incentives. The measures incentivized, including lighting, HVAC equipment and motors, are proven technologies that are readily available with known performance characteristics, and customers select energy efficient equipment from a pre-qualified list.

Business Custom Rebates. Also designed to help commercial and industrial customers save energy, this program addresses energy efficient equipment that does not qualify for a standard rebate. Applications are pre-approved by the Company and must pass cost-effectiveness criteria before the equipment is purchased and installed. Rebates are paid on a cents per kWh basis.

Strategic Energy Management (SEM). SEM provides energy education, technical assistance, and coaching for large C&I customers in order to drive behavioral change and transformation of the company culture.

Block Bidding. Under this program KCP&L purchases blocks of electricity savings by issuing a RFP to eligible customers and third party suppliers, representing reduced electric usage from non-conventional projects that may not be eligible or appropriately incentivized to participate in other programs

Small Business Direct Install (SBDI). Small business customers that typically do not have the staffing or financial resources to engage in EE activities receive targeted marketing and attractive incentives (70 percent of the full cost) for qualifying DSM measures.

These business programs are further described in Appendix A. Appendix A also contains program budgets, participation levels, targeted energy and demand savings, and cost effectiveness ratios.

C. Implementation Plan for KEEIA Cycle 1 Programs

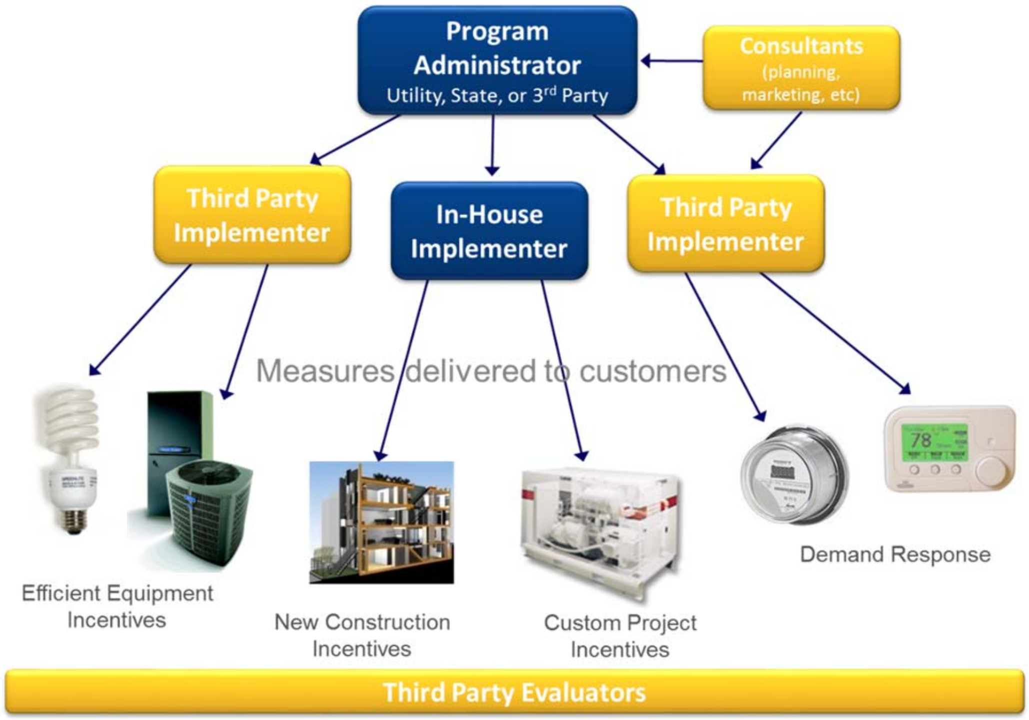
Defining a robust implementation plan for KEEIA Cycle 1 programs is a critical step in accomplishing a smooth transition from our pilot programs, integration and coordination with MEEIA programs, and a successful launch of the new programs. The section below outlines the Company's use of implementers, emphasizes the importance utilizing a tracking mechanism, and addresses the economies of scale present for implementing KEEIA Cycle 1 programs.

[5] Docket No. 11-KCPE-690-TAR, *Order Granting Application to Modify Tariff*, issued Jun. 22, 2011, p. 4-5, Ordering ¶ A; and *Order Clarifying Order Granting Application to Modify Tariff*, issued Ju1. 13, 2011, p. 2, Ordering ¶ A.

Use of Implementers

DSM portfolios are typically implemented using a combination of in-house resources and outsourced implementers. On one end of the spectrum are completely outsourced initiatives, where an implementer delivers all DSM programs on behalf of the utility. On the other end of the spectrum are completely in-house initiatives that rely solely on utility staff and personnel. Utilities typically utilize a combination of in-house resources and a network of contractors and vendors (implementers) that may provide additional expertise or economies of scale, as shown in Figure 3-1. The Company currently utilizes two implementers for the majority of its residential and business programs separately, and specialized implementers for its thermostat program and HERs/online energy tool. Utilities also typically implement the majority of their programs with in-house marketing staff and program managers overseeing implementation activities.

Figure 3-1 Example DSM Portfolio Delivery Structure



The DSM portfolio is proposed to begin on January 1, 2017. Upon approval of the tariffs, the Company will work with its internal program managers and implementers to finalize the program offering, develop a marketing plan, and determine a reporting schedule. We believe it is important to leverage the synergies of already existing systems, processes, and staff that we have developed with implementers for MEEIA Cycle 2.

The implementation contractors will primarily be responsible for:

- Assisting or leading the design and execution of program marketing materials;
- Establishing and maintaining relationships with trade allies/retailers/etc.;
- Ensuring the successful delivery of programs and installation of measures;
- Processing incentives; and
- Tracking program data.

Implementers help utilities design, launch, and implement their DSM portfolio programs, and they provide services for all types of programs for all sectors. Typically, most implementers offer services for both residential and non-residential sectors, while some specialize in certain program types or subsectors. For example, some implementers that operate within the C&I sector may specialize in small business or institutional programs, while those operating in the residential sector may specialize in income-eligible programs. Implementers can also provide a range of services to a utility including marketing, rebate processing, call center, and customer outreach.

The Company's internal program manager manages the relationship with the selected implementers and activities may include the following:

- Invoice submittal and approval;
- Customer participation submitted within the Company's tracking mechanism;
- Resolution of any customer issues;
- Call center and rebate process activities (as applicable);
- Development of strategy to achieve targets;
- Contractual issues;
- Identification of developing national trends/changes in other utility programs.

The level of implementer involvement is dependent on each program. For example, on the Home Lighting Rebate program, an implementer establishes relationships with individual retail stores, manages the store inventory and rebate level, and has "feet on the ground" within the Company's service territory to perform in-store demonstrations and ensure adequate inventory levels. However, the implementer does not perform call center, marketing, or rebate process activities because the rebate is offered as an in-store discount. In contrast, the Company's in-house business rebate program's implementer, for example, is a team comprised of energy advisors to interact with customers on audits and questions, an engineering staff to perform rebate calculations, a marketing function, a trade ally staff member, and other support staff.

The Company will engage existing implementers in providing a scope of work for delivery of KEEIA programs. The Company will work with existing implementers on a "parallel path" with the KEEIA Cycle 1 filing, technical conferences, and negotiations. This will require significant coordination to complete execution for program launch by January 1, 2017, assuming regulatory approval.

Tracking Systems

An indirect program cost that is integral to the success of any DSM portfolio is a robust tracking mechanism. A tracking tool is used for assembling, accounting, analyzing and reporting on program costs, budgets, savings, and targets by integrating data from multiple implementers and other sources. An additional benefit of enhanced tracking tools is the ability to amass customer information in order to better understand customer behavior and to improve marketing opportunities.

Economies of Scale Strategy for Implementation of KEEIA Cycle 1

As the Company continues to evolve DSM offerings and operate more efficiently, there is continued opportunity for consolidation of services, and delivery of enhanced DSM programs to our customers. As the Company prepares for the RFP process, a few key areas of operations and delivery will be strongly evaluated for improved customer experience: 1) customer contact center related to programs, 2) rebate processing, and 3) marketing support. Improvements in each of these three areas would only serve to enhance the Company's delivery to its customers.

D. Cost-Effectiveness Details

The Company engaged with AEG in the design of its MEEIA Cycle 2 program portfolio. Program designs were constructed for the 20-year period from 2016 through 2035. Industry standard cost-effectiveness tests were performed in order to gauge the economic merits of the measures, programs and portfolio. Each test compares the benefits of a DSM program to its costs using its own unique perspectives and definitions. These standard tests most commonly used were described in Section 2C.

- TRC
- SCT
- PCT
- RIM
- RIM (net fuel) Test
- UCT

The software used to perform the cost-effectiveness analyses and tests is DSMore, an industry leading tool developed and licensed by Integral Analytics based in Cincinnati, Ohio and used by many utilities and States around the country. The DSMore cost-effectiveness modeling tool takes hourly prices and hourly energy savings from the specific measures/technologies considered for the DSM program, and then correlates both to weather. This tool uses more than 30 years of historic weather variability to model expected weather variance appropriately. In turn, this allows the model to capture the low probability, but high consequence weather events and apply appropriate value to them. This captures a more accurate and realistic view of the value of DSM measures while developing outputs consistent with the California Standard Practice Manual. The input data gathered for the model is listed in Table 3-6.

Table 3-6 Cost-Effectiveness Model Inputs

General Inputs	Specific-Project Inputs
Retail Rate ($/kWh)	Utility Project Costs (Administrative & Incentives)
Commodity Cost ($/kWh)	Direct Participant Project Costs ($/Participant)
Demand Cost ($/kW-Year)	Project Life (Years)
Environmental Damage Cost ($/kWh)	kWh/Participant Saved (Net and Gross)
Discount Rate (%)	kW/Participant Saved (Net and Gross)
Growth Rate (%)	Number of Participants
Line Losses (%)	

AEG analyzed the cost-effectiveness of all measures identified. Measures that were cost-effective on a stand-alone basis (with no program administrative costs) from the TRC perspective were bundled into programs and re-screened for cost-effectiveness with the appropriate program costs included. Except for the income-eligible programs, the programs were designed to be cost-effective with a TRC benefit/cost (B/C) ratio greater than 1.0. Measures were bundled based on the end-use, the sector, and the implementation or delivery method.

Table 3-7 KEEIA Cycle 1 Program Cost-Effectiveness Results

Program	TRC	UCT	RIM	RIM (Net Fuel)	SCT	PCT
Home Lighting Rebate	1.82	3.67	0.59	0.74	2.33	2.98
Home Energy Report	1.78	1.78	0.54	0.65	1.74	N/A
Whole House Efficiency	1.20	1.96	0.61	0.72	1.35	2.30
Business Energy Efficiency Rebate - Standard	1.27	2.33	0.53	0.64	1.47	3.48
Business Energy Efficiency Rebate - Custom	0.37	0.37	0.27	0.29	0.39	N/A
Strategic Energy Management	1.81	3.05	0.98	1.39	2.00	1.90
Block Bidding	1.28	2.08	0.90	1.19	1.35	1.50
Small Business Direct Install	1.20	1.20	0.66	0.82	1.19	7.78
Residential Programmable Thermostat	1.91	3.73	0.89	1.27	2.06	2.32
Demand Response Incentive	1.28	1.26	0.65	0.82	1.52	3.66
Income-Eligible Multi-Family	2.22	2.73	1.46	1.59	2.14	1.94
Income-Eligible Weatherization	12.49	2.22	2.22	2.22	11.63	50.00
Online Home Energy Audit	-	-	-	-	-	-
Online Business Energy Audit	-	-	-	-	-	-
Research & Pilot	-	-	-	-	-	-
Total Portfolio	**1.79**	**2.51**	**0.88**	**1.08**	**1.92**	**2.47**

E. Factors Influencing Program Savings

When developing plans for the aggressive pursuit of DSM savings and benefits, three major extrinsic factors played a constraining role in influencing the projected programs savings for the KEEIA Cycle 1 filing:

- New federal appliance standards;
- Fatigued market segments; and
- Lower avoided costs.

The new federal standards and fatigued market segments lead to reduced savings and potentially lower participation, respectively, while the lower avoided costs impacts the cost-effectiveness of measures considered for inclusion in the DSM portfolio. These factors are discussed in detail below.

New Federal Appliance Standards Increase Baselines and Reduce Savings

Changes to federal appliance standards can significantly impact the energy and demand savings associated with energy efficient measures and equipment. As federal standards increase the minimum efficiency requirements of measures, the energy savings potential of existing energy efficient measures decrease. Newer, more energy efficient measures need to come to market to maintain or improve the energy savings potential. The recent changes to federal appliance standards have not been met with similar improvements in energy efficient appliances, resulting in a general decrease in energy savings potential. This has been found for lighting, appliances and residential HVAC equipment.

The United States Congress passed the Energy Independence and Security Act of 2007 (EISA) to promote EE through performance standards for electronic appliances and lighting. In particular, the legislation set efficiency standards for ‘general service’ light bulbs.

The efficiency standards are being implemented in two phases:

- *Phase 1.* From 2012 to 2014, standard light bulbs were required to transition to use approximately 20 to 30 percent less energy than traditional incandescent light bulbs (attain a minimum efficacy level of approximately 20 lumens per watt, depending on the lamp type). By institutionalizing this new baseline, the program savings available to the Company for general service lighting were dramatically reduced.
- *Phase 2*. Beginning in 2020, there must be an additional 60 percent reduction in light bulb energy use (attain a minimum efficacy level of approximately 45 lumens per watt, depending on the lamp type).

New federal standards went into effect for residential appliances and equipment between 2014 and 2015. The following residential standards impacted the Company's program portfolio:

- Heat pump standards increased in January 2015 on the cooling side from seasonal energy efficiency ratio (SEER) 13 to SEER 14, as well as on the heating side from heating seasonal performance factor (HSPF) 7.7 to HSPF 8.2.
- Clothes washer standards increased in March 2015 from a modified energy factor (MEF) of 1.26 to an MEF of 1.72 for top loaders and will increase again on January 1, 2018 to MEF of 2.0 or above.
- Clothes dryer standards raised the minimum energy factor (EF) from 3.01 to 3.73 effective June 1, 2015.
- Refrigerator and freezer standards increased in September 2014 by 25 percent versus the previous National Appliance Energy Conservation Act (NAECA) standard.
- Room air conditioner standards increased in June 2014 from 9.8 energy efficiency ratio (EER) to 11.0 EER, an improvement of 11 percent.
- Water heater standards increased in April 2015 such that units above 55 gallons will be required to be heat pump water heaters with EFs of 2.0 or above. Units 55 gallons or smaller will be required to have an EF of 0.95 or above.

All savings values included in this plan and filing are relative to the most current baseline standards as described above, and will be reflected in the Company's programs and TRM.[6]

If standards and baseline levels change in future years, we will also reflect those changes in the plan for new equipment or measures that are installed after the standard onset date. For example, if an efficient lamp such as a compact fluorescent lamp (CFL) with a measure life of five years is installed after the 2020 standard, all years of its measure life are credited lower savings relative to the new, more stringent standard. If it is installed before the standard onset; however, all years of the measure life are credited with higher savings relative to the standard at the time of install.

Another way to look at this is that we assume that at the time of the purchase decision, the equipment efficiency is locked in for the equipment lifetime in either the efficient or the baseline scenario, so if a standard changes in the middle of that lifetime, there is no effect on the pre-existing purchase decision or the energy consumption in either scenario.

This assumption aligns very closely with reality for large capital measures, but is sometimes complicated when considering lighting in particular, due to the relatively recent phenomenon of different lamp types having substantially different lifetimes. For example, if a CFL (65 lumens per watt) has a five-year average lifetime and is installed in 2018, it would (on average) last through 2023. If an EISA compliant halogen with lower efficacy (18 lumens per watt) has a

[6] See Appendix D.

three-year average lifetime, it would last until 2021, whereupon the customer would theoretically need to replace the lamp with a more efficient halogen per the 2020 standard (now 45 lumens per watt). In this plan and portfolio, we make the simplifying assumption that inventories are likely to make lamps from the previous standard available for some time after the effective date of the new standard, and further that these effects would be small and discounted far into the future, making this assumption align closely with reality for lamps as well.

Realized Savings are Lower than Planned Savings Due to Fatigued Market Segments

Market conditions in the Company's service territory have led to an exhaustion of a large portion of the low hanging fruit among a particular subset of early-adopting customers. These relatively easy-to-reach projects have intuitively been the first to be addressed in the queues of program implementers and trade allies. As these opportunities have been capitalized on in the early years of the programs, it is now a natural time to re-imagine the programs in terms of measure offerings, marketing and delivery approach, new target market segments, and the like. A further description of the Company's approach is outlined in Section 4.

Some examples of adaptations to this are provided here: As the era of large CFL savings draws closer to an end, lighting programs are making the shift to LED technologies. As straightforward business projects become less frequent, KCP&L is introducing more customized approaches that have proven to drive new and/or deeper savings in other jurisdictions, such as strategic energy management, block bidding (custom reverse auction), residential behavioral programs, and a greater focus on interactive thermostats for both energy and peak demand savings.

Declining Market Value of Energy (Lower Avoided Costs)

Large macro-level factors have driven down the cost of the marginal kilowatt-hour in energy markets in the Midwest as well as nationwide. The fracking and shale gas boom has propelled the United States into the number one rank among worldwide oil and natural gas producing nations. This fundamental shift in the global landscape and oversupply has caused natural gas commodity prices to plummet, which in turn has caused electric power market prices to drop, especially during the critical system peak times when Midwest marginal generation is almost exclusively fired by natural gas power plants. Electric power market demand has been low as well, which also contributes to lower clearing prices. Flat or declining load forecasts have been attributed to a sluggish economic recovery, the impacts of federal equipment codes and standards (see above), and successful DSM programs, among other things. This leads to a lower value of avoided cost benefits and a higher hurdle rate for DSM programs and measures to clear before they are cost-effective. Because of this, many measures that were once cost-effective are no longer justifiable, reducing overall savings potential.

SECTION 4

New Path for Kansas DSM Programs

The primary objectives identified by the Company that shape the design of the proposed DSM portfolio include:

- Satisfy the cost-effectiveness test criterion by maintaining a TRC test B/C ratio greater than 1.0 at the program level, with the exception of income-qualified initiatives and educational programs, which are allowed to bypass this criterion.
- Provide low-cost capacity reductions which require less capital outlay than traditional supply-side resources in order to provide grid relief at peak system times. Therefore, DSM programs and measures are selected that have peak demand impacts in addition to energy impacts.
- Increase customer satisfaction by delivering DSM programs that provide a positive customer experience and highlight the Company brand.
- Offer DSM programs appropriate for the Company's Kansas service territory; considering climate, culture, and market while also providing consistency to all of the Company's customers across all KCP&L jurisdictions.
- Minimize environmental risk by reducing supply-side emissions within uncertain regulatory times (EPA actions, etc.).
- Address specialized stakeholder requests such as:
  - Include whole building approaches to guide customers to a more comprehensive investment in their home/facility.
  - Consider multi-family initiatives and combined heat and power (CHP) initiatives.

Because the Company has not offered a robust portfolio to its Kansas residential and business customers since 2010, it is important that the Company consider how to re-introduce DSM within its Kansas service territory to not only increase customer awareness of a new DSM portfolio, but also encourage customers who participated prior to 2010 and during the robust portfolio of the Comprehensive Energy Plan to take additional DSM actions for their homes and businesses. For those that have not yet thought about DSM, we want to lower barriers to entry and educate them on the benefits of DSM and opportunities with the Company's DSM programs. For those that have engaged in DSM and programs in the past, we want to provide opportunities for them to dive into "deeper" retrofits that explore options with more substantial long-term savings.

The KEEIA Cycle 1 portfolio has been designed to:

1. *Serve traditional market segments and explore non-traditional segments.* While a traditional DSM portfolio will offer residential and business programs, the Company is also proposing that this DSM portfolio for KEEIA Cycle 1 includes programs for multi-family customers, income-eligible customers, and small and medium business customers that are historically a relatively "un-tapped" market in the Company's service territories. The Company will also continue to offer programs to the more "traditional" customer segments.
2. *Encourage energy and peak demand reduction*. Programmable thermostats and communicating thermostats are evolving quickly and the Company is planning to engage customers on managing peak demand and energy through a learning thermostat. The Company will also focus on deeper retrofit technologies with business customers beyond lighting.

3. *Enhance marketing*. To encourage participation through marketing, the Company will use a "branded house" strategy for program names to help customers become aware of EE offerings while leveraging the KCP&L brand. In the KEEIA Cycle 1 filing, the Company will continue to increase capabilities in understanding customer behavior and targeted marketing tactics.
4. *Provide delivery flexibility*. The proposed KEEIA Cycle 1 DSM portfolio is designed to allow for program flexibility and responsiveness to shifts in program strategy based on current unknowns becoming clearer.

The proposed Cycle 1 DSM portfolio is comprised of seven residential programs and seven non-residential programs that will deliver an effective and balanced portfolio of energy and peak demand savings opportunities across all customer segments to meet the Company's objectives defined earlier in this Report. Each program was designed to leverage the optimal mix of best-practice measures and technologies, delivery strategies, and target markets in order to most effectively deliver programs and measures to the Company's customers.

The programs are listed with a brief description in Table 3-2 and Table 3-3 for residential and business customers, respectively, in the foregoing section, and a more detailed description is provided in Appendix A. The following sections describe the new path for the proposed DSM portfolio in detail for encouraging participation in programs.

A. Ease of Participation – Kits, Audit, Prescriptive, Online Tools

For customers that have not yet engaged with KCP&L as a "trusted energy advisor," the Company strives with this KEEIA Cycle 1 portfolio to make the ease of participation in our programs for customers even easier. The programs are designed to provide multiple opportunities to allow customers to select the program options that best suit their needs. To lower the barrier of entry, we offer programs that are at little or no cost to the customer and/or that offer straightforward participation. Examples include:

- Up-stream lighting discount – Provides the simplest participation process, with instant rebates for qualifying light bulbs available to customers at the register when they shop at participating retailers. The program does not require the customer to complete any paperwork or include a time lag to receive the incentive. This program is also known as the **Home Lighting Rebate**.
- Direct install kits – Allows for quick savings in harder to reach income-eligible markets. Customers just need to schedule an appointment and be home during the visit - the measures and installation are provided at no cost. This feature is offered in both the **Whole House Efficiency** and **Income-Eligible Multifamily** programs.
- Home energy audit – Provides free in-home energy audit and direct installation of low-cost measures. Customers just need to schedule an appointment and be home during the visit - measures and installation are provided at no cost. The Company will utilize the audit as an education tool and opportunity to inform customers about their energy usage and the DSM programs. This feature is offered in the **Whole House Efficiency** program.
- Prescriptive rebates – Provides straightforward amounts to help customers quickly understand what rebates they will receive for taking action. Applications will be available online for easy access. This program is also referred to as the **Business Energy Efficiency Rebate – Standard** program.
- Online tools – Allows customers to engage when the timing is most convenient for them - likely when they are paying their bills. Customers will have access to educational materials as well as information about the Company's DSM programs that can save them energy and money. This feature is included in the **Online Home** and **Business Energy Audit** programs.

- Small business customer rebates and direct install measures – Provides incentives of up to 70 percent of installation costs. Customers are provided a free audit to identify lighting opportunities. The customer must schedule an appointment, review the audit results and approve the proposal. The contractor will conduct the audit, install the lighting equipment and process the paperwork. This program is also referred to as the **Small Business Direct Install** program.

B. Deeper EE Retrofits and Engagement

For customers that have historically participated in a DSM program, the Company offers programs to help them provide the next level of "deeper" EE retrofits.

During MEEIA Cycle 1, the Company noted a large percentage of C&I customer participation included lighting options. Therefore, a large focus on KEEIA Cycle 1 business program offerings will be to bring Kansas C&I customers into the adoption curve for comprehensive savings measures in lighting and non-lighting end uses, and working with trade allies who specialize in these deeper retrofit measures. A more comprehensive list of prescriptive measures and simple incentive formulation of the custom program will help customers feel more comfortable with how the Company supports their investments.

Additionally, with a **Strategic Energy Management** program, the Company will be able to engage with a handful of large customers who can look at projects holistically for their business and develop operational savings as well as capital investments.

The **Block Bidding** program encourages customers and third-party suppliers to creatively propose non-conventional projects that may not fit into a business EE rebate prescriptive or custom project. Proposals are solicited for blocks of energy and funding is awarded based upon the cost per energy saved and project cost-effectiveness.

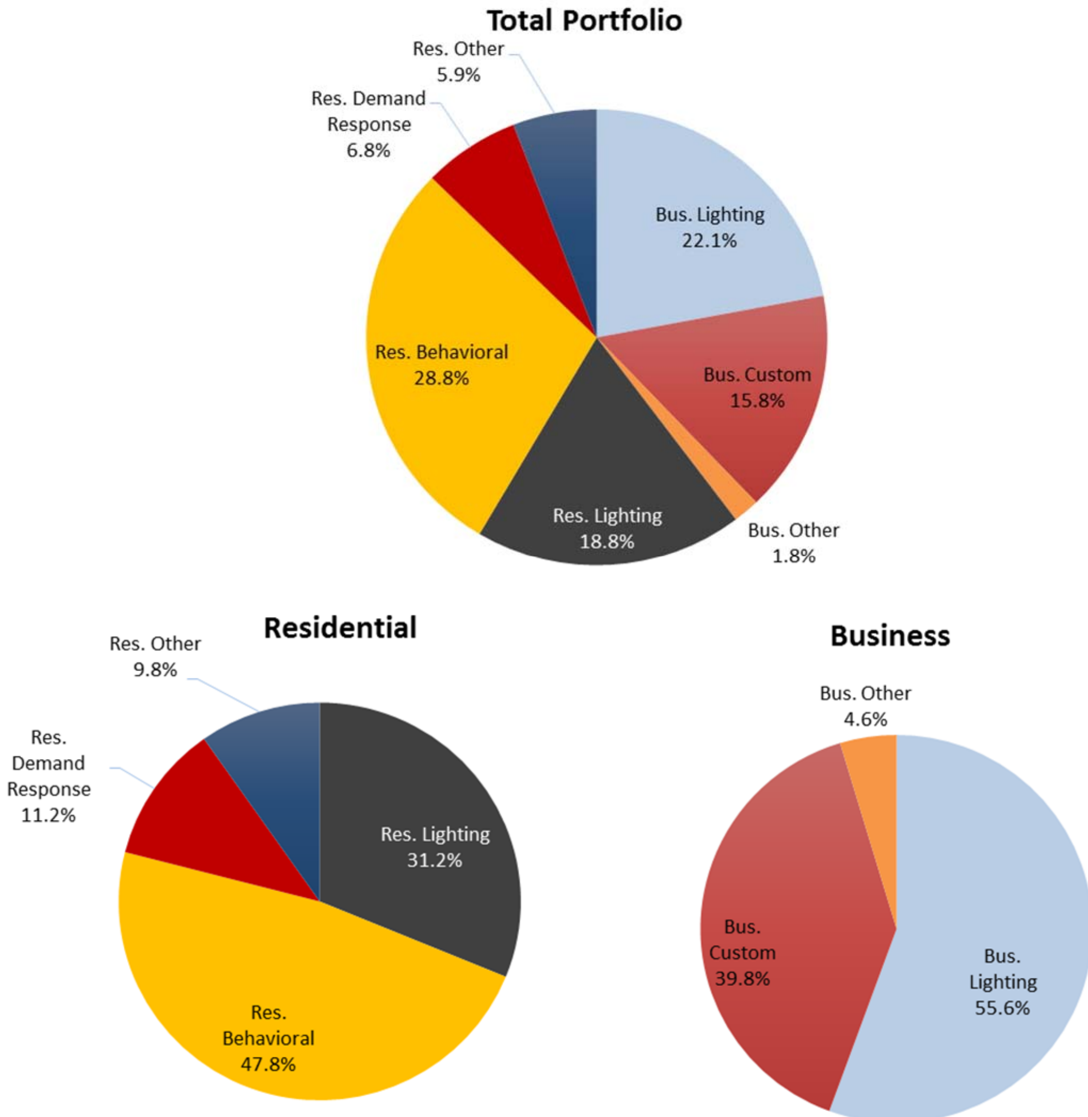
CHP projects, while not specifically identified as a separate program in the portfolio plan, are another example of a more comprehensive look at energy that can be evaluated under the Business Energy Efficiency Rebate - Custom program. Customer segments that are most likely to present CHP projects are those that have high electric load factors and large heat requirements like industrial processors, hospitals and manufacturers. Those customers that are committed to a holistic look at energy in this manner can provide opportunities to evaluate. Preliminary economic analysis of these types of projects indicates that projects of larger than 1 MW capacity are most likely worth further analysis to confirm cost effectiveness. Applicable and eligible projects can be included as a special option within the Business Energy Efficiency Rebate - Custom program that pays an incentive based on the installed generating capacity of the unit at system peak.

On the residential side, the **Whole House Efficiency** program brings customers along the path to further investment in their home by offering an introductory walkthrough audit to identify key areas for investment and direct installation of low-cost measures, providing quick wins for savings. The audit results will be used as an education tool and opportunity to inform customers about their energy usage and other program opportunities. Customers have multiple opportunities and are rewarded with bonus incentives for purchasing and installing multiple measures.

While online and digital tools can provide an easy way to engage customers, if designed well they can also engage customers to dig deeper into their understanding and ultimate usage of energy in their homes. This is evidenced by the more prescriptive nature of how customers use energy and what they are doing with it.

Below is a figure depicting the projected breakdown by KEEIA Cycle 1 cumulative energy savings (MWh) by end use, showing that lighting now comprises less than 50 percent of planned savings, although portions of the Block Bidding and Strategic Energy Management savings may include some lighting savings. This represents a much greater focus on diversity of load, customers, and program delivery.

Figure 4-1 KEEIA Cycle 1 Cumulative Energy Savings by End Use



C. Newly Targeted Market Segments

Over time, the Company has continued in many respects with program offerings, marketing, and messaging aimed at the "average" or "typical" customer. Bolstered with key account representatives, program staff, a trade ally network, and outreach and education efforts, this is an effective way to reach those customers.

As the Company portfolio has grown and become more sophisticated, it has become apparent that not everyone is the "average" or "typical" customer. We have identified a number of important and unique target market segments that require a more customized structure and approach.

- Income-Eligible – Customers who do not typically have funds to invest in EE nor do they have awareness of measures - they often have larger concerns, etc.
- Multi-family – Situations where there is a split agent/market actor problem where the owner is in charge of equipment purchases, but renter pays the energy bills. This situation often overlaps with income-eligible concerns stated above.

- Small Business – These customers are so busy and often preoccupied that we need to make participation very simple, easy, and economically attractive for them. There are significant savings to be had in this segment and also significant returns to local businesses and the community.

D. Demand Response

The Company believes there is significant value in managing the peak demand of our customers and believes that the KEEIA statute allows for such programs to help customers benefit themselves and other customers. In recent years, one DR option, thermostat technology, has evolved tremendously and DR customer interaction has improved significantly as well.

Thermostat Technology

Programmable thermostats and associated communicating technology is evolving quickly, and the Company plans to take the next step to engage with customers on managing peak demand and energy usage through their thermostat.

In 2015, the Company embarked on a multi-site, multi-technology study with the Electric Power Research Institute (EPRI) to evaluate the energy and demand savings potential from multiple thermostat technologies (EPRI Smart Thermostat study).

While the Company does not yet have completed results from its EPRI Smart Thermostat study, various similar studies have been published within the industry that substantiate our expected findings; that is, two-way communicative, “learning” thermostats have significant electric energy capabilities.

- A study released by Cadmus found that Wi-Fi enabled thermostats saved 16 percent on cooling electricity usage.[1]
- The Energy Trust of Oregon recently released a study of learning thermostats used with electric heat pump heating. The study found a savings of 12 percent on heating electricity use.[2]

Furthermore, the inherent capability of being able to communicate and receive data from the thermostat and verify that it is installed and programmed will be a clear indication of whether or not behavior is changing and equipment run time is being reduced (ultimately saving kWh usage) from what it might have otherwise been.

Due to the two-way verifiable nature of DR enabled thermostats, the Company is proposing to claim energy savings associated with DR enabled behavioral thermostats in addition to the demand savings.

Traditional Programmable Thermostats

Traditional programmable thermostats allow customers to set a pre-programmed schedule for raising or lowering the temperature in their home, but do not have built-in intelligence to modify the programmed schedule due to changing conditions or customer preferences. While the ability to pre-program thermostats can be a convenient feature and save energy for some households, there are challenges and difficulties with programmable thermostats in the long-term. Many people find that they are not intuitive and are hard to program. Ultimately, programs that are

[1] Wi-Fi Programmable Controllable Thermostat Pilot Program Evaluation; prepared for The Electric and Gas Program Administrators of Massachusetts; prepared by Cadmus Group, September 2012, p. 21.

[2] Energy Trust of Oregon Nest Thermostat Heat Pump Control Pilot Evaluation, by Apex Analytics, Oct. 10, 2014, p. 1-1.

created are often overridden at some point – people change and their schedules change - and often times the thermostats are not reprogrammed.

Learning Thermostats

Unlike a traditional programmable thermostat, a learning thermostat:

- Understands a customer, their schedule and the temperatures they are comfortable with when they are home or away.
- Understands a customer's home: how tight or leaky it is and how efficiently their heating and cooling systems are functioning, as opposed to just how frequently they are running.
- Understands the external and internal environment: physical occupancy, humidity, light, and weather data are all incorporated within their algorithms.

A learning thermostat uses all of these features to meticulously and automatically create a custom schedule and thermal profile for a customer's home, which is constantly adapting and optimizing a customer's equipment in its environment as habits change.

Once the learning thermostat has learned a customer's habits and their home's thermal profile, a learning thermostat can reduce a customer's heating, ventilating and air conditioning (HVAC) runtime by 20 percent relative to un-programmed thermostats holding a constant temperature.

Learning thermostats are uniquely capable of achieving savings while continuing to provide outstanding customer comfort – a critical combination that has paved the way for this technology's success. A learning thermostat leverages its vast set of sensors and sophisticated algorithms to deliver a suite of features that help to painlessly capture available energy savings.

Unlike other thermostats that suffer from schedule decay and a loss of engagement, learning thermostat savings persist year after year. Learning thermostats help customers save energy in a user-friendly way, making the device an effective addition to the Company's KEEIA portfolio, as demonstrated by a number of recent studies:

- Learning thermostat manufacturers have conducted their own study on learning thermostat users across the country and found an average 17 percent savings on air-conditioning electric usage (as well as 10 percent gas heating savings).[3]
- NIPSCO, an electric and gas utility in northern Indiana, performed a similar study of learning thermostats and found 16 percent savings on air-conditioning electric usage and 13 percent on gas heating savings.[4]
- Vectren, an electric and gas utility in southern Indiana, recently released a study of learning thermostats and found that they saved 14 percent on air-conditioning electric usage (the study also found gas heating savings of 12.5 percent).[5]

Thermostat Approach to DR

The Company will continue striving to increase customer satisfaction and customer engagement as it pertains to our DR programs. This will entail utilizing "learning" thermostats and leveraging their unique capabilities to use what they learn about each customer's comfort range, occupancy patterns, and the thermal characteristics of their home to determine a customized approach to

[3] Energy Savings from the Nest Learning Thermostat: Energy Bill Analysis Results, Nest Labs, February 2015, p. 6.

[4] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Northern Indiana Public Service Company; prepared by Cadmus Group, Jan. 22, 2015, p. 3.

[5] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Vectren Corporation; prepared by Cadmus Group, Jan. 29, 2015, p. 3.

DR. For each participant, the Company will combine pre-cooling, temperature setbacks, and cycling to achieve the maximum load reduction possible while still maintaining an outstanding customer experience.

As the technology embedded within the "learning" thermostats continues to advance, so will the capabilities for DR as well as the level of kWh and kW reductions.

DR Incentive

The Company is requesting DR programs be an integral part of the KEEIA Cycle 1 portfolio of programs due to the fact that decreasing the potential to hit the Company's system peak is a valuable goal driven by DR. Historically, the Company offered a **DR Incentive** (DRI) program to business customers who could curtail or shift electric demand of 25 kW or more, and is now proposing to offer DRI in its KEEIA Cycle 1.

DR programs are truly unique from EE programs because the participant is most often required to have more than a "one-time" investment in efficient measures and equipment. Therefore, while the overall capacity needs of the Company can shift from year to year, it is important not to fluctuate the DR program offerings and risk causing customer confusion or fatigue that would decrease participation.

For the Company to adequately recognize and maintain steady and reliable DR programs, it is important to use valuation and planning practices with a long-term perspective, similar to supply-side options that put "steel in the ground." As a result, the Company uses the cost of new entry (CONE) of a representative simple-cycle natural gas combustion turbine (CT) as a proxy for the avoided capacity cost. The Company used this value in all years of the KEEIA Cycle 1 planning horizon for all demand side programs so there would not be a disconnect between the value of the reduction of peak demand from EE as well as DR.

Technology Stack Approach to DR

Traditionally DR portfolios have been viewed as a singular, amalgamous resource comprised of all assets that function in the manner of a DR asset. These portfolios were viewed in the same lens whether the immediate need was for 1 MW or 100 MW. This however led to infrequent utilization of DR resources due to the sense that DR resources could only be utilized in large scales of magnitude.

Due to market and technology shifts as the Company has developed its DR program over time, the Company has naturally acquired multiple iterations of DR resources - each with their own curtailment capabilities, reliability/verifiability and levels of customer impact.

Given these advances in technology, the Company intends on adopting a "Technology Stack Approach" to DR wherein the specific character traits of the various types of DR technology are leveraged strategically to extract maximum value in relation to peak demand reduction while minimizing customer impact. This will help ensure that we consistently make use of our DR assets while doing so in the most meaningful way.

This will entail creating a "protocol of usage" evaluated on (a) temperature, (b) duration of reduction need and (c) customer impact. These usage examples will serve as guidelines on which DR asset to utilize given:

- The anticipated temperature.
- The duration of the projected need for curtailment.
- The estimated customer impact associated with utilizing a specific DR asset for a specified amount of time during defined weather conditions.

Avoided Cost Economics

The Company is proposing an adjusted look at avoided costs for all programs (including both DR and EE) due to the shortened nature of KEEIA three-year cycles compared to the Company's

20-year planning horizons. This entails viewing the avoided cost of capacity as the levelized cost of a new generating unit in all years of the KEEIA Cycle 1 planning horizon.

This change to a single value based on CONE for a CT is necessary to provide consistency for the value of DR and the demand component of EE. This is one of three perspectives generally taken in the DSM industry, each of which can be valid given the appropriate circumstances and objectives. The three perspectives are provided below with some explanatory detail and a publicly available example.

Perspective 1) Allow Avoided Cost of Capacity to Float with the Market

This is the most uncertain method with respect to future planning and is used most frequently when DSM programs are delivered in an open-market environment. An example is the "State of Pennsylvania DSM – 2013 Act 129 Demand Response Study":

> In PJM, the majority of the regional capacity resources are secured during a Base Residual Auction. This auction is held in May, three years prior to the delivery year. A delivery year begins on June 1st and ends on May 31st of the following calendar year. The avoided cost of capacity values the Pennsylvania EDCs [electric distribution companies] will use to assess the cost-effectiveness of their 2012 DR programs were established in May 2009 and are shown below in Table D 1 along with the zonal capacity prices for the next three delivery years.[6]

Perspective 2) Start at Market Prices for Capacity and ramp up to CONE over time

This method is a hybrid approach that recognizes dynamic market prices in the near term but also recognizes the need for future certainty, often in a vertically-integrated utility environment. An example is the "Ameren Missouri 2013 DSM potential study Vol. 4":

> Base case: "The Ameren forward view of the market price for capacity is based on the assumption that electric load continues to grow and that there is a finite amount of generation in the market. When load approaches supply, new generation will be needed and the system will incur the Cost of New Entry (CONE) for a peaking generator."[7]

Perspective 3) Use a Single Value for Avoided Capacity Costs based on CONE for all years

This method most strongly focuses on the long-term value of demand-side resources in the planning process. An example is the "Idaho Power 2011 IRP Appendix C":

> The marginal resource Idaho Power is trying to avoid with DSM efforts for summer on peak hours is the construction of a simple cycle combustion turbine. The estimated levelized capacity cost of building a new SCCT is approximately $94 per kW over a 30-year expected plant life. For demand response or direct load control DSM programs operating during the summer peak, the $94 per kW becomes the cost threshold for program cost-effectiveness.[8]

As mentioned above, the Company is using Perspective 3 in its KEEIA Cycle 1 plans. Simply using the market price as in Perspective 1 is not representative of the long-term view and primarily vertically-integrated nature of the Company's business. Using Perspective 2, where the market price for capacity is ramped up to the full cost of a CT, results in a seesaw effect for the

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6 http://www.puc.pa.gov/pcdocs/1230512.docx, p. 22, Table D.1.

7 http://www.ameren.com/-/media/Missouri-Site/Files/environment/renewables/irp/irp-chapter8-appendixb-vol4.pdf?la=en, pp. 2-14 and 4-1.

8 http://www.idahopower.com/pdfs/AboutUs/PlanningForFuture/irp/2011/2011IRPAppendixCTechnicalAppendix.pdf, p. 67.

price of avoided capacity as successive KEEIA plans are conducted. If the near-term market conditions are allowed to set the agenda and dictate the long-term valuation each time a new analysis is performed, it will be difficult to plan, design, and manage programs.

E. Marketing Enhancements

Integrated Marketing Communications Approach

The Company continues to demonstrate that integrated marketing communications delivers the highest levels of awareness building and program participation. Customers need multiple exposures to a message before taking action, thus, we believe that the "surround sound" approach of having multiple, carefully orchestrated messages in multiple channels over sustained periods of time works best. Figure 4-2 below displays different tactics to accomplish "surround sound".

Figure 4-2 Surround Sound Marketing Tactics

The surround sound approach is optimized around the marketing funnel (Figure 2-4), which represents the path customers take from awareness to education to conversion, and, finally, to continued engagement. The Company drives customers from awareness to conversion by matching marketing campaign elements to customers' informational needs at various points within the marketing funnel. Customers are then supported through the engagement portion of the funnel when other KEEIA programs in which they have not yet participated are cross-promoted to them.

Figure 4-3 Marketing Path Toward Customer Engagement

Finally, as the Company develops campaigns, it considers seasonality and coordination with other customer touch points, such as starting electric service. When efforts focus on timely and relevant opportunities to connect with customers already primed by seasonality or natural interaction with the Company, the likelihood they will participate in programs is increased.

Campaigns provide the greatest return on investment when all elements are strategically planned, have relevance to specific audiences and work in concert with each other.

Targeted Marketing Communications

The Company includes targeted marketing communications in the mix of strategies that make up the larger integrated marketing communications approach. While mass marketing casts a wide net, targeted marketing is more analogous to spearfishing.

To successfully employ a target marketing campaign of capturing individual customers and urging them through the marketing funnel, three elements are needed:

- A well-defined target audience;
- Messaging that is relevant to that audience; and
- Distribution at relevant times and integration with other marketing.

Target Audience Definition

While all eligible customers may participate in programs (and are reached via mass marketing tactics), some customers are more likely to participate. The Company has increasing capability to leverage a variety of internal data sources to develop profiles of these customers. For example, data such as current participant attributes, Nielsen and Acxiom segmentation,[9] usage patterns, and digital body language can be stitched together. Such leveraging reveals a set of customers who will likely participate if contacted via targeted marketing communications.

Message Development

Once an audience is defined, relevant and impactful messaging is developed. In the past three years, the Company has learned how programs are understood, received, and used by their residential and commercial customers. In developing an impactful message, the Company will dig deeper into those perceptions via primary and secondary research to more fully understand how the proposed and continuing programs are perceived and used by our customers, as well as customers' decision making processes and the benefits they find most motivating. These insights will enable the continued creation of messaging that will resonate with and be motivating to customers.

Distribution and Integrated Marketing

Direct, targeted marketing is most successful when customers have already been exposed to messaging through mass marketing awareness tactics, as part of a larger integrated marketing strategy. Importantly, the targeted message must also reach them at a time when they are already primed by either seasonality or something occurring in their life, with which KEEIA programs can help.

For instance, the Company runs email campaigns that are automatically triggered when customers take certain actions. When customers start service with the Company and opt in to receive email communications, they receive a series of welcome emails that provide helpful tips and information, including our current pilot KEEIA programs such as the Online Energy Audit. These emails generate higher-than-average open and click-through rates, indicating this content is highly relevant to them.

[9] Nielsen and Acxiom provide customer segmentation data that help their clients discern consumers' likes, dislikes, lifestyles and purchase behaviors.

Triggered campaigns also are utilized to encourage customers to finish the process of participating in a program. For example, in the case of the Whole House Efficiency program, if a customer completes the audit, but has not yet progressed to replacing windows or air conditioner, for example, the customer will receive an email reminding them of the benefits of replacing their air conditioning unit or windows and recapping the next steps in the process.

Program Names

The Company continues to utilize the "branded house" strategy for program names to help customers become aware of DSM offerings while leveraging the KCP&L brand.

The program names are comprised of straightforward key words that describe literally what customers receive or experience when they participate. The program names will also be adaptive for marketing purposes during the cycle to keep in touch with what best helps customers understand these programs and why they should participate. And with this approach, when the program names are preceded by the KCP&L brand name, the credibility of that brand name is transferred to the individual programs, which helps customers know they can place trust in the offering. It also ties individual programs into one cohesive portfolio.

F. Delivery Flexibility

For the reasons outlined in this section, the Company feels strongly that program flexibility and adaptability are vital to the health and success of program implementation. We, therefore, propose to file general tariffs with some values such as incentive levels given in ranges instead of specific values, or given as a reference to an external and accessible document such as a website or portal, which can be changed as needed by the Company without the resource-intensive process of a tariff revision involving significant investment of time by both the Company and external stakeholders. The Company outlines a change process in the residential and business umbrella tariffs that is applicable to practical changes in programs that do not change the intent or general implementation of the program. This change process in no way reduces the Company's commitment to collaborate and communicate openly with the Advisory Group regarding said programmatic adjustments during regular program reviews, roundtables, and updates.

We outline below the rationale for this that would ensure planned campaigns remain flexible and responsive to shifts in program strategy based on current unknowns becoming clearer, the need to balance costs versus participation through the year, and other unanticipated variables.

Market Drivers / Implementer Capabilities

The market can change significantly from the time of the planning period (2015-2016) to the end of the KEEIA Cycle 1 (2019). While the Company has anticipated some market changes (*e.g.*, residential lighting and appliance standards), the plan will need to be flexible enough to react to changes as they occur to keep customers engaged in the program while minimizing free ridership and maximizing spillover.

Flexibility can be provided in a few ways:

1. Allow for flexible incentive ranges to respond to market prices.
2. Allow for the budget to be shifted between programs and/or budget categories.
3. Continue to utilize a portion of the budget for research and pilot programs. The budget would be earmarked for innovative programs and alternative methods to increase energy and demand savings. Research and pilot programs include opportunities for the Company to remain innovative and continually provide customers with cutting-edge, effective programs to reduce their energy and demand consumption. Advisory Group input on programs would be sought.

The Company will work closely with the implementers throughout the KEEIA program cycle to anticipate market changes, tailor marketing and promotional tactics and materials, and better understand customer interactions with the DSM programs. The implementers selected will have the experience and knowledge to enhance the DSM programs, improve implementation processes, marketing and promotional tactics, program tracking, etc.

Incentive Ranges

The Company will continue to provide program details, including customer eligibility, incentive levels and program applications, as applicable, on www.kcpl.com to allow for proper visibility during the course of the program cycle. The initial incentives set through the planning process will be reviewed with the chosen implementers and throughout the KEEIA program cycle to determine if modifications are needed to reflect market conditions. The actual incentive offerings can be adjusted with the Company's change process outlined in the residential and business umbrella tariffs. If other tariff related (non-incentive) changes need to be made the Company will follow appropriate steps to file for amended tariffs.

The Company's tariffs are set up such that each tariff highlights the key framework of the programs, but allows straightforward, easy to understand details including specific measures and incentive levels to be outlined via www.kcpl.com. The proposed ranges for incentives to be offered during KEEIA Cycle 1 listed by measure are included in Appendix B.

Long Lead Projects

The Company, Advisory Group, and the KCC must acknowledge that there are programs that have long lead times from application to completion and should consider how those programs should be treated within a DSM framework that has a very specific time period with goals, EOs, and recovery of a TD. We propose that these long lead projects be complete by the end of the portfolio period to be fully accounted for within the cycle that it was applied.

For KEEIA Cycle 1, the Company has identified that the Business Energy Efficiency Rebate - Custom program has the most exposure to these types of long lead projects. To mitigate this exposure, the Company proposes that June 30, 2019, be the last day for customers to submit an application for KEEIA Cycle 1 rebate levels under the Business Energy Efficiency Rebate - Custom program. All pre-approved projects must be completed and all final paperwork and supporting documentation must be submitted by December 31, 2019. The Company will communicate to customers and trade allies that all new projects received for pre-approval after June 30, 2019, will be retained and evaluated under KEEIA Cycle 2 terms and conditions once approved by the Commission.

By proposing a specific deadline, this allows the Company and its EM&V consultant to fully and accurately incorporate those projects in the evaluation and NTG ratio for KEEIA Cycle 1, and within the EM&V timeframe.

Research & Pilot Programs

The Company knows that technology and innovation will drive the evolution of DSM programs and therefore has included a budget allowance for research and pilot programs. The marketplace is evolving quickly and research is being done to help utilities understand what customers want from EE.

While the suite of program offerings in this filing will be a great enhancement to Kansas customers, there could be further opportunities to meet customers' needs going forward. Therefore, the Company will undergo a process during the cycle to address new, unserved, or underserved customer markets and identify cost-effective energy and demand savings strategies that could be considered for future implementation during the three-year cycle. A few examples of areas of research and potential pilot programs are listed below. At the time this KEEIA filing is being made, a specific research or pilot program has not yet been confirmed to progress during Cycle 1.

- Expanding upstream programs to include additional lighting, HVAC and consumer electronics.

- Using whole building benchmarking as a tool to prioritize buildings over 50,000 sq. ft. for delivery of streamlined EE services (including retro-commissioning).
- Refining target markets so as to reduce the potential for free riders.
- Evaluating and re-evaluating incentive payment levels with a view to modifying them as appropriate.
- Using a single point of contact to increase program participation rates and reduce customer acquisition costs.
- Working with large employers in the service territory to market EE services to their employees.
- Assistance with whole building deep energy savings for new construction and existing buildings.
- Whole home approaches for new and existing homes.
- Co-delivery with gas utilities.
- Engaging teachers, school administrators and students about EE. Some implementers provide information directly at the schools through interactive sessions or educational materials.
- Commercial mid-stream lighting programs provide an opportunity to achieve more market penetration for customer sectors that might be missed by traditional standard and custom programs. Similar to a residential program in that an instant discount is provided, the commercial program though is delivered at distributor level directly to contractors primarily working on behalf of small and mid-size businesses.

G. Recovery Mechanism

Utility Incentive Alignment Discussion

At present, the Company's EE Rider recovery method takes a retrospective approach to recovery by filing for recovery of EE program costs after the end of each fiscal year and recovering such costs over a 12-month period beginning in July of the following year, thereby creating a lag of up to 18 months from the time costs are incurred until they are recovered from customers in rates. Further, the existing recovery mechanism only allows for the recovery of past program expenses and does not consider the impact on revenues from lost kWh sales directly resulting from EE investments.

KEEIA establishes a state policy allowing for recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs. In support of that goal, KEEIA requires the Commission to:

- Provide timely cost recovery for utilities;
- Ensure that utility financial incentives are aligned with helping customers use energy more efficiently and in a manner that sustains or enhances utility customers' incentives to use energy more efficiently; and
- Provide timely earnings opportunities associated with cost-effective, measurable and verifiable efficiency savings.

In order to achieve the goals of KEEIA, the Company recommends the creation of a DSIM recovery mechanism that addresses these three main components through prospective recovery of program costs and TD and an opportunity to retain a portion of net benefits for the Company's shareholders as an EO.

Recovery of the direct program costs includes recovery of the direct costs associated with program administration (including evaluation), implementation, and rebates to program participants, all of which are necessary to obtain the benefits EE can provide. Timely recovery is also required for the impact of reduced sales on the utility.

Recovery of the impact of reduced sales on utility financial performance is not intended to provide additional earnings to the Company, but rather to keep the Company whole, consistent with its existing regulatory framework and as required by KEEIA. Without proper alignment of the Company's financial incentives, EE causes negative effects to the Company's financial performance as both earnings and cash flow suffer. Providing recovery, dollar-for-dollar, of these fixed costs reverses the negative financial effects, known as the TD, associated with EE. In order for TD recovery to be recognized in 2017-2019 the amount of such recovery must be objectively determinable at the time. In order to meet this requirement the Company has proposed the use of a TD model to calculate the effect of deemed kWh savings resulting from EE measures installed on the Company's kWh sales and revenues. To ensure that this interest in recognizing and recovering the TD in the period in which the Company's revenues are impacted are balanced against KEEIA's requirement that demand-side programs are subject to independent evaluation, the Company proposes that adjustments be included in the Company's EO award for the effect of difference in evaluated kWh savings compared to deemed savings used in calculating the TD.

The effect on shareholder value compared to supply-side alternatives recognizes the opportunity cost to the utility of substituting DSM for supply-side alternatives. Demand-side resources cannot be valued equally to supply-side resources without providing an equivalent opportunity to enhance shareholder value. Providing timely EOs moves demand-side resources beyond a break-even proposition and allows fair competition with supply-side alternatives; thus allowing the utility to value the two options equally.

How Does the Proposed Mechanism Work?

The Company is proposing a DSIM structure for residential and non-residential customers consistent with the KEEIA statute. The proposed structure includes timely recovery of two cost components: program costs and a TD, plus an EO which would be recovered over a two-year period following final determination based on EM&V in the year following the 36-month program period. The Company is requesting approval of a DSIM Rider to begin collecting 100 percent of forecasted program costs and 100 percent of the forecasted TD, which is directly attributable to the demand-side programs approved in this filing. The DSIM Rider will be updated semi-annually with a reconciliation of the prior periods forecasted program costs and TD to calculated historical amounts with carrying costs on any under- or over-recovery. The TD recovery is also subject to retrospective EM&V review through adjustment of the EO.

Program cost budgets include approximately $29.7 million that will be incurred for implementation of the DSM programs over the 36-month period following the effective date of the tariff sheets including subsequent EM&V costs incurred in the year following the 36-month period of KEEIA Cycle 1. The TD represents the financial disincentive posed on the utility for each kWh saved as a result of successful implementation of EE and helps ensure that the Company is kept whole and not financially harmed or deterred from promoting EE. The TD is estimated at a total of approximately $20.0 million[10] that is intended to recover any lost margin revenues through the date when the effect of EE resulting from KEEIA Cycle 1 on billed kWh sales is reflected in base rates through a general rate case. The Company proposes to begin recovery of program costs and TD starting January 1, 2017 given approval by the Commission and will continue until all program costs and TD are recovered. The kWh savings will be

[10] Assumes an initial rate case filed March 1, 2018, with rates effective November 1, 2018 using a test year ending September 30, 2017; followed by a subsequent rate case filed March 1, 2021, with rates effective November 1, 2021 using a test year ending September 30, 2020.

reflected in the TD by multiplying the deemed kWh savings for each program as listed in the Company's TRM for standard measures or calculated kWh savings for custom measures for the respective month times the incremental rate for each respective customer class. The Company proposes a NTG initial factor of 1.0 will be used for contemporaneous TD recovery.

Annual kWh savings per standard measure will be updated prospectively in the Company's TRM no later than 24 months after tariffs are effective based on EM&V ex post gross adjustments determined for Year 1.

On a semi-annual basis, forecasted amounts will be "trued-up" to match billed revenues to the costs and TD experienced in actuals, along with carrying costs on the over or under-recovered balances at the Company's short-term borrowing rate.

The DSIM for Cycle 1 will also include an EO for the Company to retain a portion of the net benefits of demand-side programs based on its performance in meeting established savings goals through the three-year period. The allowance of an opportunity to earn a financial incentive allows the Company to value demand-side investments equally with supply-side investments consistent with the KEEIA state policy. The Company proposes a full EM&V will be performed including an ex post gross adjustment and NTG determination for EO with no NTG floor and no NTG cap. For purposes of the EO, the kWh and kW savings measurements will be determined through the EM&V performed every 18 months (or twice during the cycle) including NTG with no floor or cap on the NTG factor, based on measures installed in that year annualized unless otherwise described in the EO matrix shown in Appendix I.

Allocation of Program Costs, TD and EO

In general, KEEIA programs are designated as either residential or non-residential (business) and will be recovered by residential or non-residential customer classes, respectively. Commission-approved program costs, TD and EO relating to the Income-Eligible Multi-Family Program and, Income-Eligible Weatherization Program will be allocated 50/50 to residential and non-residential customer classes for recovery. The research and pilot program costs will be allocated appropriately to the customer classes. The research and pilot program costs will be assigned appropriately to the customer classes affected by the research and pilot program.

Rider Details

Initial Rate Calculation

The proposed DSIM Rider for KEEIA Cycle 1 reflects the recovery of KEEIA program costs, TD and EO award, including applicable interest. The rate to be charged to residential and non-residential classes will initially be determined by dividing the total of the estimated program costs plus 100 percent of the estimated TD for residential and non-residential classes for the six-month period from January through June or July through December costing period. Those costing periods will be divided by the projected energy (kWh) sales for each class, excluding lighting classes, over that same six-month period. The Rider will be based on semi-annual collection of 100 percent of the forecasted program costs and 100 percent of the forecasted TD collected contemporaneously with their incurrence, with true-ups to match billed revenues to the costs and TD calculated.

While the Cycle 1 EO will eventually be included as a component of recovery in the DSIM rate, no dollars will be earned until the conclusion of EM&V at the end of Cycle 1. An EO dollar amount is not expected to be included in the DSIM rate until about January of 2021. Once earned, the EO will be collected through the DSIM rate over a 24-month period.

The DSIM Rider charge is applicable to all KCP&L Retail Rate Schedules with the exception of Lighting Schedules.

Monthly Interest

Monthly interest will be calculated for the monthly cumulative over- and under- monthly balances for KEEIA program costs, TD and any EO award. The monthly interest rate will be the Company's monthly short-term borrowing rate at that particular time.

True-Up

It is the intent of the Rider that the Company will ultimately bill customers for an amount as close as reasonably practicable to the actual KEEIA program costs incurred, the TD, and any EO award as provided for herein. Therefore, on a semi-annual basis, the Company will file an adjustment or "true-up" to the DSIM Rider for actual performance achieved based on monthly tracking of actual program costs and calculated TD as outlined above.

Rider Components

Program Costs

The Plan includes KEEIA program costs of approximately $29.7 million which are based on the planned budgets for the 15 KEEIA programs (7 residential, 7 business and the Research & Pilot program) to be delivered over approximately 36 months beginning January 1, 2017 and ending December 31, 2019, including final EM&V costs incurred in 2020. Actual program costs will include the incremental cost of planning, developing, implementing, monitoring, and evaluating demand-side programs. General administrative costs will be included on the basis of the estimated budget for each program. Indirect costs associated with DSM programs, including but not limited to costs of a market potential study, marketing, and/or the Company's portion of a statewide TRM, will be included in the program costs.

The Company follows Generally Accepted Accounting Principles (GAAP) for financial accounting. GAAP encompasses the conventions, rules, and procedures necessary to define accepted accounting practice at a particular time. Further, the Company maintains their books and records in accordance with the Federal Energy Regulatory Commission's (FERC) Uniform System of Accounts.

The Company will utilize FERC Account 908 Customer Assistance Expenses to track direct KEEIA-related program costs. Payroll taxes and benefits loadings on incremental direct labor incurred in support of KEEIA programs will be charged to FERC Account 408.1 Taxes Other Than Income Taxes, Utility Operating Income and FERC Account 926 Employee Pensions and Benefits, respectively.

The Company has established an accounting distribution coding system for the proper classification of program costs for KEEIA-related DSM programs. The accounting distribution utilizes the following components:

- Account – The prescribed accounts mandated by FERC in the Code of Federal Regulations for the classification of assets, liabilities, revenues and expenses.
- Department – A code assigned to specific operational areas to identify the group responsible for the cost.
- Operating Unit – The operating unit identifies the jurisdiction associated with the cost.
- Project ID – The project id identifies the KEEIA program associated with the cost.
- Work ID – Additional codes to further specify the type of work or specific purpose for the cost.
- Resource – Identifies types of costs used to complete projects, or what was used to get the work done. A primary example would be labor vs. non-labor items.

Taken in their entirety, the combination of codes above will allow for the proper classification and clear delineation of costs. These codes will be expanded as needed to accommodate the programs included in this KEEIA filing.

TD

The Plan includes estimated TD of approximately $20.0 million. TD will be computed monthly in the following manner.

1. The kWh savings will be reflected in the TD by multiplying the estimated kWh savings times the incremental rate for the respective class. If a rate case occurs during the

program life, the cumulative kWh and kW savings will be included in the test period to reflect actual energy and demand savings in the weather-normalized/customer-annualized unit sales and sales revenues used in setting the revenue requirements in the case. This will result in establishing a rebased level to re-start the kWh and kW savings for the TD to be included through the remainder of the program period. The Company will use billing determinants from the last rate cases to establish incremental rates.

2. Estimated kWh savings by month by program will be determined as follows:

    - The number of standard measures installed each month for the Business Energy Efficiency Rebate – Standard, Small Business Direct Install, Home Lighting Rebate, Whole House Efficiency and Income-Eligible Multi-Family programs will be multiplied by the annual kWh savings per measure defined in the TRM attached as Appendix D to determine the savings for measures installed by month aggregated by program to which such measures belong. Annual kWh savings for custom measures installed in the Business Energy Efficiency Rebate – Custom, Strategic Energy Management, Block Bidding, Whole House Efficiency, Income-Eligible Multi-Family, Income-Eligible Weatherization and Residential Programmable Thermostat programs will be calculated and reported monthly by the program implementers and aggregated by program by customer class.
    - The total kWh savings for the current month aggregated by program in (i) above will be multiplied by 50 percent to reflect an assumed mid-month installation.
    - Each month total kWh savings by program will be accumulated from the beginning of the cycle through the preceding month.
    - The sum of items (ii) and (iii) above will be multiplied by the monthly load shape percentage for the applicable month by program attached as Appendix J to determine monthly kWh savings.
    - Monthly kWh savings resulting from the Home Energy Report program will be reported monthly by the implementer.
    - The sum of the monthly kWh savings determined in (iv) and (v) above will be multiplied by the incremental rate by customer class to determine monthly TD.
    - A NTG floor of 1.0 will be used for contemporaneous TD recovery.
    - Annual kWh savings per measure will be updated prospectively no later than 24 months after the commencement of the Plan based on EM&V ex post gross adjustments determined for Year 1.

The applicable accounting standard which most directly addresses the requirements for the recognition of revenues under such alternative revenue programs is Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 980-605-25 "Alternative Revenue Programs". ASC 980-605-25 sets three conditions for revenues resulting from alternative revenue programs such as the DSIM.

First, the program must be established by order of the regulatory commission allowing for automatic adjustment of future rates. Second, the amount of revenue for the period must be objectively determinable and probable of recovery. Lastly, the revenues must be collected within 24 months of the period in which they are recognized. If the TD is subjected to subsequent recalculation, the Company would not be able to recognize the revenue in the periods that sales were reduced which would not result in alignment of utility financial incentives.

EO Award

In order to align the Company's interests with "helping its customers use energy more efficiently and in a manner that sustains or enhances such customers' incentives to use energy more efficiently" the Company proposes an EO which would allow the Company to retain a portion of the net benefits of providing a demand-side program for its shareholders. The proposed EO recognizes the value of energy (kWh) and demand (kW) savings, as well as providing energy savings opportunities to income-eligible customers. The KEEIA Cycle 1 EO award at 100 percent of target is $8.5 million for the Company, which represents approximately 16.8 percent of estimated net benefits of the proposed KEEIA Cycle 1 programs. The remaining 83.2 percent of estimated net benefits would be retained by KCP&L's Kansas customers. The EO matrix shown in Appendix I shows the mechanism by which the Company will earn the EO. Except for the HER and Low Income programs, the EO will be earned proportionally to the actual kWh and kW achieved as determined by the EM&V evaluator including ex post gross and NTG adjustments.

The EO awarded will be adjusted as follows:

1. *TD Ex Post Gross Adjustment* **–** At the end of the three-year cycle, the annual ex post gross measures for each program determined through the final EM&V will be used to recalculate the TD as described above for each of the annual evaluation periods. The difference between the recalculated TD using ex post gross measures and the TD using the deemed numbers, whether an increase or a decrease will be adjusted in the EO, including carrying costs at the short-term borrowing rate.
2. *TD NTG Adjustment* **–** At the end of the three-year cycle, if the portfolio EM&V NTG is greater or less than the initial factor of 1.0, the difference between TD at 1.0 NTG and the TD calculated using the EM&V NTG, subject to a NTG cap of 1.10 and a floor of 0.90, will be recovered through the EO, including carrying costs at the short-term borrowing rate.

   The EO cannot go below zero. The EO (before adjustments reflecting TD EM&V including NTG) cannot go above approximately $12.0 million.

Rate Case EE Annualization

Upon filing a rate case, the cumulative, annualized, normalized kWh and kW savings through the test period will be included in the unit sales and sales revenues used in setting rates the test year to reflect energy and demand savings in the billing determinants and sales revenues used in setting the revenue requirements and tariffed rates in the case. Upon the adjustment for kWh and kW savings in a rate case, the collection of TD will be re-based.

- Test period weather-normalized kWh usage for each customer class by billing month will be adjusted by:

  Adding back the monthly kWh energy savings by customer class incurred during the test period from all active KEEIA programs, excluding HERs program which have a one-year measure life, determined using the same methodology as described in the DSIM Rider, Tariff Schedule 18, except that calendar month load shape percentages by program by month will be converted to reflect billing month load shape percentages by program by computing a weighted average of the current and succeeding month percentages.

- The adjusted test period sales from above will be annualized for customers and additionally be adjusted further by:

  Subtracting the cumulative annual kWh energy savings from the first month of the test period through the end of the test period by customer class from all active KEEIA programs, excluding HERs, determined using the same methodology as described in the DSIM Rider, Tariff Schedule 18 except that calendar month load shape percentages by program by month are converted to reflect billing month load shape percentages by program by computing a weighted average of the current and succeeding month percentages.

- Test period kW demand for each customer class will be adjusted by:

  Adding back the monthly kW demand savings by customer class incurred during the test period from all active KEEIA programs, excluding HERs and DRI programs, determined using the same methodology as described for kWh savings in the DSIM Rider, Tariff Schedule 18 and then:

> Subtracting the cumulative annual kW demand savings from the first month of the test period through the test period by customer class from all active KEEIA programs, excluding HERs and DRI programs, determined using the same methodology as described for kWh savings in the DSIM Rider, Tariff Schedule 18.

TD will continue to be calculated and recovered until such time as a rate case is filed subsequent to the end of KEEIA Cycle 1 with a test period ending at or after the end of Cycle 1.

Impact on Customers

For estimates of the impact on customer bills and rates, see Appendix H.

Impact on Financials / Credit Ratings

Table 4-4 following presents the projected impacts of the proposed programs costs and DSIM recoveries, including incentive components such as TD and EO, over the period 2017 – 2022 on projected Company earnings. This analysis assumes 100 percent achievement of kWh and kW savings, program cost budgets and EO.

Table 4-1 KEEIA Cycle 1 Plan Impacts on Company Earnings **Confidential**

	NPV*	2017	2018	2019	2020	2021	2022
Operating Revenues							
Lost Margins	[redacted]						
Program Cost							
Throughput Disincentive							
Performance Incentive							
Total Operating Revenues							
Operating Expenses							
Program Costs							
Total Operating Expenses							
Operating Income							
Interest Charges							
Income (Loss) Before Income Taxes							
Income Taxes							
Net Income (Loss)							

**Net Present Value (NPV) – The NPV at the weighted average cost of capital (WACC) of 6.3938%*

Although the EO is proposed to be collected over two years (presumably in 2021 and 2022), accounting standards require the recognition of the revenues in Company earnings in the year in which it is anticipated to be objectively determined (assumed to be 2020 in this projection). Lost margins and TD recovered assumes an initial rate case filed March 1, 2018, effective November 1, 2018 using a test year ending September 30, 2017 followed by a subsequent rate case filed March 1, 2021, effective November 1, 2021 using a test year ending September 30, 2020.

Table 4-5 below reflects the projected impacts of the KEEIA Cycle 1 Plan with incentive components, including TD and EO, on certain of the Company's key credit metrics: Debt/Total Capital, Funds from Operations (FFO)/Debt and FFO/Interest. The Company's current five-year forecast covers the years 2016-2020. The 2020 baseline metrics are used for 2021 in the following analysis solely for the purpose of showing the impact of the KEEIA Cycle 1 Plan.

Table 4-2 KEEIA Cycle 1 Plan with Incentive Components Impact on Key Credit Metrics **Confidential**

	Metric	2017	2018	2019	2020	2021
Baseline Credit Metrics	Debt / Total Capitalization	[redacted]				
	FFO / Debt					
	FFO / Interest					
KEEIA 2017-19 Plan Impacts	Debt / Total Capitalization					
	FFO / Debt					
	FFO / Interest					
Credit Metrics w/ KEEIA 2017-19 Plan	Debt / Total Capitalization					
	FFO / Debt					
	FFO / Interest					

The results of this analysis demonstrates that the overall impacts of the KEEIA Cycle 1 with DSIM, including incentive components, are small but generally positive and supportive of credit quality. The analysis above supports the conclusion that the DSIM as proposed aligns with Company incentives.

Table 4-6 below reflects the projected impacts of the KEEIA Cycle 1 Plan without incentive components, including TD and EO, on certain of the Company's key credit metrics.

Table 4-3 KEEIA Cycle 1 Plan without Incentive Components Impact on Key Credit Metrics **Confidential**

	Metric	2017	2018	2019	2020	2021
Baseline Credit Metrics	Debt / Total Capitalization	[redacted]				
	FFO / Debt					
	FFO / Interest					
KEEIA 2017-19 Plan Impacts	Debt / Total Capitalization					
	FFO / Debt					
	FFO / Interest					
Credit Metrics w/ KEEIA 2017-19 Plan	Debt / Total Capitalization					
	FFO / Debt					
	FFO / Interest					

If the TD and earnings components of the DSIM are not included, each of the Company's key credit metrics is negatively impacted. This analysis demonstrates that the inclusion of these components of the DSIM is essential to align the DSIM with the Company's financial incentives.

H. TRM and Simplifying EM&V process

TRM Format

The Company's proposed TRM format is a consolidated and interactive table containing all the key variables and assumptions necessary to characterize the measures for implementation, tracking, and evaluation purposes. The TRM document is available in Appendix D. Each measure characterization is populated with the following parameters, based on the Company's default planning values:

- Measure Name;
- Program;
- Market Segment;
- End Use;

- Unit Definition;
- Incremental Measure Cost ($/unit);
- Electric Energy Savings (Annual kWh/unit);
- Nameplate Demand Savings (kW/unit) (if applicable);
- Peak Coincidence Factor (if applicable);
- Coincident Peak Demand Savings (kW/unit);
- Annual Operating Hours (if applicable);
- Measure Life (years);
- Measure Efficiency Value and Definition;
- Baseline Efficiency Value and Definition;
- Description of Electric Energy Savings Algorithm (if applicable);
- Incentive Amount ($) and Description (initial incentive amount used for planning);
- Data Source(s).

Based on a Microsoft Excel file with interactive formulas to calculate savings, the formulas can be inspected and interrogated to observe how the default planning values are constructed and calculated. The TRM does not include programs or measures that are abstract, unique, or customized, which would not lend themselves to such a standardized format. These excluded programs include: block bidding, SEM, business EE rebate - custom, HER, and DRI. The savings for these programs are calculated using engineering calculations and later verified through the EM&V process.

Improvements in Transparency for Implementation and Evaluation

The first incarnation of the TRM, in Microsoft Excel table format, provides a transparent and intuitive central resource for implementers, trade allies, customers, regulators, planners, and evaluators to access the relevant measure characteristics and calculations. This allows easier access to the measure values so that projects can be planned, savings and incentives can be estimated, and processing and evaluation can be expedited.

Measure values are defined on "per unit" basis whenever possible in an attempt to utilize the most intuitive unit definition for each measure. For example, lighting equipment measures are most frequently specified in terms of "per bulb," while an efficient cooling system is specified in terms of "per ton of cooling capacity" to enable customers to estimate the savings, incentives, and costs of their own unique projects.

An eventual evolution of the TRM would be to post it in table form online and add interactive features. A portal could be constructed to host change-tracking/version control abilities, allowing measures to be updated as new evaluation data becomes available throughout the program implementation; all the while archiving and storing old values in a history for reference and documentation.

Sources for the TRM include the Company's potential study[11], recent EM&V studies from MEEIA Cycle 1 for GMO, and secondary sources.

[11] See Appendix L to this Report, *Demand-Side Resource Potential Study Report* and *Demand-Side Resource Potential Study Report – Demand Response*, Navigant Consulting, Inc., released Aug. 2013.

SECTION 5

Supporting Detail for New Path

The Company continues to strive to learn from customer feedback and EM&V results in how best to develop and offer programs. Below are a few examples of work done in the marketplace to better understand what customers and stakeholders would like from DSM programs.

A. Customer Feedback / EM&V Results

The following are some ways that the Company incorporated feedback in the development of its programs.

- EM&V documentation of customer feedback – Navigant was the Company's evaluator for MEEIA Cycle 1 and has been selected as the Company's evaluator for MEEIA Cycle 2. Navigant continues to provide valuable feedback in the EM&V process through what it hears from trade allies and participants in our programs. The feedback in the EM&V includes direct customer testimonials and insights to awareness, satisfaction and opportunities to improve the programs. Further, as discussed earlier, the Company plans to utilize MEEIA Cycle 2 implementers and tracking mechanism for KEEIA Cycle 1. These consistencies create synergies and continuity regarding customer feedback, which in turn allows the Company to incorporate customer feedback and meet the needs of the stakeholders.
- In addition, the Company has obtained feedback on programs offered from customers in Kansas through the online advisory panel.
- Large customer interaction – The Company has seven professionals dedicated to interacting daily with our largest 250 C&I customers regarding their energy use, including how they can be more efficient. These interactions are captured and provided to program managers to better understand the customers' motivations to take efficiency actions.
- Large customer survey – The Company conducts an annual survey of its largest 250 customers through E-Source, an electric utility consultant, to engage and learn from our C&I customers regarding many topics including EE and DR.
- Online customer advisory panel – The Company has an online panel that is set up as an ongoing mechanism to provide high speed results that attempt to be representative of the Company's residential customer base. The results of the panel are utilized to give insight into reactions to current programs or "hypothetical" situations to determine how people would behave or take action.
- Trade ally forums – The Company offers forums with its residential and commercial trade allies who interact with the Company's customers through the Company's programs. At the forums, the Company gains insight and feedback from this critical sector that has a major influence over energy efficient behavior in our territories.
- Multi-family working groups – Over the last two years, the Company has participated in national and local multi-family sector EE working groups to better understand the stakeholders, influences and needs of this some-time difficult to reach market segment. The ACEEE has provided good insight into program design and Blue Hills Community Services, a local not-for-profit community development corporation that is a developer and partner in urban neighborhoods, has convened a good cross-sectional group to understand all the stakeholders and how to overcome barriers to help this sector.

Key Conclusions

Below are a few key conclusions that we have determined based on the above customer feedback:

- Multi-family is an underserved sector where there is much support to gain traction in promoting and influencing EE to building owners and tenants.
- Residential customers continue to confirm that they generally still think of money savings rather than energy savings as a primary motivator in their EE actions. There will continue to be opportunities to cross-promote programs as overall awareness has room to grow.
- Residential customers are generally satisfied with programs but are not as sure or satisfied with the energy savings received by participating.
- Business customers and trade allies like straight-forward, easy to understand and complete rebate structures as opposed to highly technical and involved calculations for incentives.

B. Cost Allocation of Income-Eligible and Pilot Programs

As discussed in Section 4, while the exact nature of the future pilot programs (designated under Research & Pilot) is undetermined, the Company will split the costs of the programs among residential and non-residential customers as appropriate to reflect how the budgeted funds are utilized to explore programs that hit each market segment.

Additionally, all dollars spent on income-eligible programs (including TD) are split among residential and non-residential customer class types for recovery.

C. Tracking of Benefits – Deemed Measure Lives and Benefits

In the creation of the 2017-2019 KEEIA Cycle 1 plan, the Company used DSMore version 8.0.00 to calculate the NPV of the avoided costs (avoided energy and demand savings) for each measure on a per unit basis for each program year. For tracking and reporting purposes during the course of the program cycle, the Company will use this per unit savings to calculate the monthly benefits based on actual monthly program activity.

This method allows the Company to streamline the monthly benefits calculations and does not require running DSMore each month, which is a very time-consuming process. For example, the avoided energy and demand savings from a DSMore model run for a standard measure with 5,000 units equals a DSMore model run for one unit multiplied by 5,000. This is the case because no other inputs are being changed except participation quantity. For custom projects, it will be calculated on a per kWh basis for avoided energy costs and per kW basis for avoided demand costs. The relationship between kWh/kW and avoided energy/demand costs is also linear since no other inputs are changed. Thus, it is only necessary to run the DSMore model once for each program year, rather than every month, to determine the monthly Shared Benefits.

D. Reporting

Annual Report

Consistent with the requirements of the KEEIA statute, the Company will provide an annual report to the Commission on or before May 31, 2018, May 31, 2019 and May 31, 2020 describing the results of the KEEIA Cycle 1 DSM programs for the previous calendar year. Each report will include:

(1) program expenditures, including incentive payments;

(2) peak demand and energy savings impacts and the techniques used to estimate such impacts;

(3) avoided costs and the techniques used to estimate such costs;

(4) the estimated cost-effectiveness of the demand-side programs;

(5) the net economic benefits of the demand-side programs; and

(6) a comparison of the commission-authorized program budget to actual costs.

In addition to this reporting requirement under the KEEIA statute, the Company will also apprise stakeholders of portfolio progress during the Advisory Group meetings.

SECTION 6

Collaborative Process to Approval

A. Technical Conference Schedule

The Company proposes a set of technical conferences to cover an array of topics that will likely be of interest to Staff and other stakeholders in the approval process. The Company is flexible on topics, the total number of discussions, and exact dates of the technical conferences, but the Company is prepared to have weekly discussions via conference call/webinar and/or in person when appropriate to improve the overall understanding of our filing. The Company is available to begin the proposed Technical Conferences as early as Wednesday, April 20, 2016 with weekly meetings following.

Table 6-1 Proposed Technical Conference Schedule

KEEIA Cycle 1 Proposed Technical Conference Schedule	
	Dates/Subjects can be flexible based on stakeholder interest
Week 1	**Technical Conference #1**
	Overview - Exec Summary of Filing • Portfolio Targets • DSIM Rider
	Program Details - Residential Programs • Lighting • Income-Eligible Programs
Week 2	**Technical Conference #2**
	Program Details - Business Programs • Demand Response programs - (DRI and Thermostat) • Energy Efficiency programs
	Marketing Strategy
Week 3	**Technical Conference #3**
	TRM Details – Sources • Baselines and Deemed Savings
	Avoided Cost Assumptions
Week 4	**Technical Conference #4**
	Recovery Mechanism • Transition from EE Rider to DSIM Rider • TD, Program Costs, and EO • Financial Accounting TD

Week 5	**Technical Conference #5**
	Recovery Mechanism (Continued)
	• Rate Assumptions
Week 6	**Technical Conference #6**
	Additional Topics / Time
	• Stakeholder Interest

B. Stakeholder Access to Information

The Company will also provide to Commission-approved intervenors both public and confidential work papers associated with the proposed KEEIA Cycle 1 filing in supplementary attachments to support the detail of this filing in accordance with a Protective Order, including the filing of non-disclosures by the intervenors. Work papers will include, but not be limited to:

- Navigant 2013 Potential Study (Appendix L);
- Program design tool analysis spreadsheets;
- DSMore batch tool and template file;
- Financial analysis impact spreadsheet; and
- Impact on customer rate analysis.

C. Key Factors and Company Positions for Approval

Business Risk Impact

The utility incentive related to the DSIM is intended to put the utility's earnings ability on a level playing field with generation supply resources. The incentive is not intended to be a windfall profit to the utility, but instead a stabilizing factor that will allow for growth in DSM applications that will benefit all stakeholders. The earnings analysis provided in Table 4-3 demonstrates that the incentive mechanism as proposed by the Company essentially keeps the Company whole.

If the current DSIM recovery mechanism is modified to preclude current recognition of TD revenues by making it subject to retroactive determination, or if the EO does not put the utility's earnings ability on a level playing field with generation supply resources, this would exacerbate regulatory lag and discourage potential investors, leading to a discount on the Company's stock price and an increase in the cost of equity capital. In addition, the rating agencies consider many quantitative and qualitative factors when reviewing a company's credit ratings. If the DSIM recovery mechanism does not balance the risk of both customers and the Company, the agencies may perceive this as a regulatory environment that is less than supportive to the utility. In Moody's Investors Service rating methodology, as much as half of the weighting is based on the qualitative analysis of the company's regulatory framework and ability to recover costs and earn returns. Their view of relative credit supportiveness considers the prevalence of automatic cost recovery provisions and reduced regulatory lag. Standard & Poor's rating methodology also relies on qualitative analysis of the company's regulatory environment that includes an assessment of the company's ability to recover all operating and capital cost in full and the timeliness of cost recovery to avoid cash flow volatility.

Utility Incentives Alignment and Policy Context

(1) The stated goal of the KEEIA is to promote the implementation of cost-effective demand-side programs in Kansas;[1]

(2) The stated policy of the KEEIA is to value demand-side program investments equal to traditional investments in supply and delivery infrastructure as much as practicable and allow recovery of the reasonable and prudent costs associated with delivering Commission-approved demand-side programs[2] and, in support of those goals, the KEEIA states that the Commission shall:

   (a) Provide timely cost recovery for electric public utilities;

   (b) Ensure that financial incentives for an electric public utility are aligned with helping such utility's customers use energy more efficiently and in a manner that sustains or enhances such customers' incentives to use energy more efficiently; and

   (c) Provide timely earnings opportunities for public utilities associated with cost-effective, measurable and verifiable demand-side program savings.[3]

The Company's requested DSIM includes a request for recovery of program costs on a real-time basis, TD, and an EO based on EM&V results. The recovery of TD proposed by the Company will help mitigate the negative financial impacts that are currently present for utility investment in DR and EE programs. The TD represents the financial disincentive imposed on the utility for each kWh saved as a result of successful implementation of EE and helps ensure that the Company is kept whole and not financially harmed or dis-incentivized from promoting EE.

However, absent a DSIM that addresses and mitigates the financial TD that exists, the Company will be unable to increase the level of funding for these programs. In addition, if the TD is subject to retrospective recalculation the Company will not be able to currently recognize the TD revenues which would result in a negative impact on Company earnings until the final amount of TD is determined. As a result, it is essential that the TD be based on deemed savings in order to be objectively determined in the period in which it is calculated.

In this filing, the Company has demonstrated these programs meet the cost-effectiveness test and these programs have been shown to be less costly to customers than the alternative of no programs and unmitigated peak demand and energy usage. The untapped potential for the Company's demand-side programs exists because it is never easy to get customers to pay more today to save an even greater amount later. This is true even under the best economic conditions and has always been the major impediment to sustainable, aggressive, cost-effective, DR and EE program implementation.

D. Achievable Time Schedule

The Company's existing pilot programs expire on December 31, 2016. The timing of this filing provides for an achievable timeline under the KEEIA statute in order to allow for the proposed new programs to begin on January 1, 2017.

[1] K.S.A. 66-1283.

[2] Id.

[3] Id.

SECTION 7

KEEIA Cycle 1 2017-2019 Report – Witness Listing

Following is a reference matrix identifying the witness(es) for each Section, subsection, table, figure and appendix of the Report. Witness profiles are provided in Appendix F, *Witness Details*.

KEEIA Cycle 1 2017-2019 Report – Witness Listing				
Report Section		**Section Heading / Sub-heading**	**Page #**	**Witness**
1		**Executive Summary**		
	A	***Filing Background***		Turner/Winslow
	B	***Highlights of Plan***		Winslow
		Overall Savings and Budget		Winslow
Table	1-1	Program Details		Winslow
Figure	1-1	Annual Estimated Program Budget by Program ($ thousands)		Winslow
Figure	1-2	Cumulative Energy Savings by Program (MWh)		Winslow
Figure	1-3	Cumulative Summer Peak Demand Savings by Program (MW)		Winslow
Table	1-2	Portfolio Cost-Effectiveness Summary		Nelson
	C	***Development of KEEIA Cycle 1 Plan***		Winslow/ Foltz/Nelson
		Program Offerings Based on Customer and Resource Needs		Winslow
		KEEIA Cycle 1 Framework		Winslow
		Program Portfolio		Winslow
		Cost Recovery Mechanism		Foltz
		TRM		Nelson
		Advisory Group		Winslow
		EM&V		Winslow
		Tracking and Reporting		Foltz
	D	***Collaborative Process to Approval***		See Below
		Schedule		Turner
		Alignment of Statute / Stakeholders / Utility		Ives
2		**Benefits of DSM Programs**		Winslow
	A	***Customer Benefits and Participation***		Winslow
Figure	2-1	Forecasted Annual KEEIA Cycle 1 Participation		Winslow

KEEIA Cycle 1 2017-2019 Report – Witness Listing				
Report Section		**Section Heading / Sub-heading**	**Page #**	**Witness**
Figure	2-2	Forecasted Three-Year Cumulative KEEIA Cycle 1 Participation		Winslow
Table	2-1	Forecasted KEEIA Cycle 1 Participation by Program		Winslow
		Customer Education		Winslow
		Promotion of DSM as Win-Win		Winslow
Figure	2-3	Example of Marketing Funnel		Winslow
	B	***Local Economic Benefits – Jobs and Investment***		Winslow
		Trade Allies, Implementers, Economic Activity		Winslow
Table	2-2	Implementer Local FTEs Supporting MEEIA Cycle 2		Winslow
	C	***Cost-Effectiveness – Systematic Quantification of Benefits***		Nelson
		Customer Benefits (Participants and Non-Participants)		Nelson
		DSM as a Long-Term Resource in a Balanced Portfolio		Nelson
	D	**Environmental Benefits Now and Future Possible Avoidance**		Nelson
3		**DSM Experience to Date and Proposed Portfolio**		Winslow
	A	***Successful Delivery of Programs***		Winslow/Turner
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KEEIA Cycle 1 2017-2019 Report – Witness Listing				
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		▪ DSIM Tariff – Rate Schedule 18		Foltz/Turner
		▪ Revised Tariffs – Rate Schedules 6 – 80, except 18		Turner
		Appendix F – Witness Details		All witnesses
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KEEIA Cycle 1 2017-2019 Report – Witness Listing				
Report Section		**Section Heading / Sub-heading**	**Page #**	**Witness**
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APPENDIX | **A**

KCP&L-KS Detailed Program Descriptions

This appendix provides detail on key elements of each program in the portfolio.

Residential Programs

KCP&L's Residential DSM programs serve residential customers, encouraging investment in energy awareness and energy efficient measures such as lighting, HVAC equipment and weatherization.

Home Lighting Rebate

Goal	Increase the penetration of efficient lighting in customer homes by incentivizing the purchase of energy efficient® qualified LEDs.
Target Market	Residential customers as well as lighting manufacturers and local retailers.
Description	The Home Lighting Rebate Program incentivizes the purchase and installation of efficient lighting utilizing an upstream strategy to provide customers incentives on qualifying LED light bulbs at participating retailers. Customers receive an instant incentive at the point-of-purchase. The incentives vary depending upon the type of light bulb, manufacturer and associated retail cost.
Implementation Strategy	KCP&L will engage a third-party implementer to efficiently obtain the energy savings goals while adhering to the budget. The implementer will: • Establish relationships with lighting manufacturers and retailers throughout KCP&L's service territory. • Provide in-store promotional materials and retail sales staff training. • Track program performance, including tracking sales data, reviewing sales data for accuracy and payment to retailers. • Periodically report progress toward program goals and opportunities for improvement. KCP&L will work with the implementer to market the program to customers and educate retailer sales staff. Marketing efforts to increase customer awareness may include, but not be limited to: • Bill inserts; • Newspaper advertisements; • Internet placement; and • Point-of-Purchase materials (hang tags, posters). The Home Lighting Rebate Program will be cross-marketed with KCP&L's other Residential DSM Programs and used to increase awareness of KCP&L DSM rebates.
Risk Management	Upstream programs simplify the participation process for residential customers, eliminating the need to complete and submit a rebate application. However, upstream programs typically have higher free ridership and leakage outside of the service territory. A number of steps will be taken to reduce free ridership and leakage while increasing spillover, including: • KCP&L will work with the implementer to select retailers located well within KCP&L's service territory to reduce leakage outside of the service territory. • The Home Lighting Rebate Program will be cross-marketed with KCP&L's other Residential DSM Programs (*e.g.,* bill inserts will promote multiple programs). • Incentives will be modified as needed to respond to the market price of qualifying light

bulbs, with a goal of the incentive being no higher than 50% of the incremental cost.
- KCP&L will work with the implementer and third party evaluator to understand any market transformation elements that arise from this upstream program.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions using the change process identified in the tariffs.

Measure	Unit	Average Incentive per Unit
LED	per Bulb	$4.00

Estimated Participation

The analysis assumed that a customer would purchase/receive six light bulbs, on average.

Estimated Incremental Customer Participation

Measure	PY1	PY2	PY3
LED	12,500	30,000	30,000

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings.

Projected Net Savings per Measure

Measure	Unit	Net kWh Savings per Unit	Net kW Savings per Unit
LED	per Bulb	32	0.00312

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
2,378	5,820	5,820	0.24	0.59	0.59

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery			
Administration			
Education & Marketing			
Evaluation			
Total			

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Home Energy Report

Goal	Reduce consumption via socially- and information-driven behavioral change and raise general awareness of energy efficiency and KCP&L's DSM programs.
Target Market	Residential single family homes.
Description	The Home Energy Report Program provides individualized energy use information to residential customers while simultaneously offering recommendations on how to save energy and money by making small changes to energy consuming behaviors. Energy reports are sent periodically to customer households to give them self-awareness and a peer comparison of their energy usage. Customers are also provided access to an online tool to track energy consumption and offer tips to reduce usage. Social competitiveness increases behavior to reduce energy consumption.
Implementation Strategy	KCP&L will select an implementer that specializes in developing and issuing residential energy reports. The implementer will utilize experimental design to select report recipients and a control group, design the reports and develop customized energy reduction tips with input from KCP&L. The program will cross-promote and market the KCP&L DSM portfolio.
Risk Management	Potential issues/risks to be aware of include: • The program may undergo a meaningful change in customer responsiveness and evaluation paradigms in the coming years. • Research is being conducted on the persistence of savings after the program has ended. The program has been assumed to have a one-year measure life and therefore has a relatively high-cost of energy savings on a lifetime or levelized cost basis. • Customer attrition may reduce the potential achievable program savings. The implementer may account for customer attrition by adding new customers each year during designated periods. The program provides a significant opportunity to promote KCP&L's Residential DSM programs via the customer reports and the online tool, thereby resulting in increased program spillover. However, the spillover impact will need to be carefully determined through an impact evaluation.
Measures & Incentives	Customers receive personalized energy reports, but there is no monetary incentive.
Estimated Participation	**Estimated Number of Participating Households** (see table below)
Projected Energy & Demand Savings Target	A NTG ratio of 1.0 was applied to the energy and demand savings. The average savings per household is a planning estimate, the implementer will aim to achieve the total net savings provided in the table. **Projected Net Incremental Program Savings** (see table below)

Estimated Number of Participating Households

PY1	PY2	PY3
65,000	65,000	65,000

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
6,506	11,410	13,526	1.30	2.26	2.71

Estimated Program Budget

Customers do not receive a monetary incentive. The delivery budget includes the implementer administration and start-up costs as well as the education and marketing

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Online Home Energy Audit

Goals

Encourage energy education and conservation, as well as further engagement in the broader portfolio of DSM programs.

Target Market

Residential customers.

Description

The program provides residential customers access to a free online tool to analyze the energy efficiency of their home, educational materials regarding energy efficiency and conservation, and information on KCP&L DSM Programs.

The program goals include:

- Increase awareness of household energy consumption.
- Educate residential customers about the benefits of energy efficiency and the opportunities to reduce energy consumption.
- Increase awareness of and participation in other KCP&L DSM programs.

Implementation Strategy

KCP&L will engage a third-party contractor to develop and maintain the online tool(s).

Risk Management

The Online Home Energy Audit Program is an educational program that informs customers of household energy consumption and methods to reduce energy usage. KCP&L will strategize ways to highlight the audit tool on the KCP&L website and increase customer engagement.

Measures & Incentives

There are no monetary incentives.

Estimated Participation

Program participation was not estimated for this program.

Projected Energy & Demand Savings Target

Program savings were not estimated for this program because it is deemed an educational program.

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery			
Administration			
Education & Marketing			
Evaluation			
Total			

Cost-Effectiveness

N/A

Whole House Efficiency

Goal	Encourage whole-house improvements by promoting home energy audits and comprehensive retrofit services.
Target Market	Residential customers that own/rent a residence or are building a new residence as well as HVAC contractors for trade ally participation.
Description	The Whole House Efficiency Program consists of three options: **Option 1: Home Energy Audit.** The customer receives an in-home energy audit and direct installation of low-cost measures. The audit will identify potential efficiency improvements. The low-cost measures to be installed include: faucet aerator, low-flow showerhead, advanced power strip, water heater tank wrap, hot water pipe insulation and LEDs. **Option 2: Weatherization Measures.** Customers that have completed Option 1 are eligible to receive incentives for the purchase and installation of air sealing, insulation and ENERGY STAR® windows. **Option 3: HVAC Equipment.** Customers are eligible to receive incentives for qualifying HVAC equipment installed by a participating contractor. Customers are not required to have participated in Option 1 or 2. Qualifying measures include heat pump water heaters, Electronically Commutated Motor ECM furnace fans, heat pump ductless mini splits, central air conditioners and heat pumps. Early retirement incentives are provided to customers with central air conditioners and/or heat pumps in operable condition and at least five years of age. Customers that install multiple items will be provided a bonus incentive per the requirements listed in the chart. (see table below) Residential customers that rent a residence must receive the written approval of the homeowner/landlord to participate in the program. The program goals include: • Demonstrate persistent energy savings. • Encourage energy saving behavior and whole house improvements. • Help residential customers reduce their electricity bills. • Educate customers about the benefits of installing high efficiency HVAC equipment. • Develop partnerships with HVAC contractors to bring efficient systems to market.
Implementation Strategy	KCP&L will engage a third-party implementer to efficiently obtain the savings goals while adhering to the budget. The implementer will: • Hire/sub-contract local staff to perform home audits and direct measure installation. • Engage customers and schedule home audit appointments. • Provide customer service support. • Establish relationships with local HVAC contractors to work with the program installing energy efficient HVAC equipment and infiltration measures. • Process rebate applications, including review and verification of applications and payment of customer rebates. • Track program performance, including customer and HVAC contractor participation as well as quality assurance/quality control (QA/QC). • Periodically report progress toward program goals and opportunities for improvement. KCP&L will work with the implementer to market the program to residential customers and HVAC contractors utilizing the following approaches:

Requirements	Bonus Incentive
Air Sealing and ENERGY STAR® Windows	$300
Option 2 + CAC/HP	$100
Option 2 + Early Retirement CAC/HP	$150
Option 2 + HP Replace Electric Resistance	$200

- Direct outreach to customers, including bill inserts, newspaper advertisements, email blasts, direct mail, bill messaging, and community events;
- Engage contractors to promote awareness of and use rebates to help sell qualifying equipment; and
- Cross-market with KCP&L's other Residential DSM Programs.

Risk Management

It is important that the measures are properly installed and customer satisfaction is high. Therefore, it is crucial to engage experienced contractors. To enroll in the program, it is recommended that contractors provide KCP&L with (1) proof of insurance on an annual basis, and (2) at least two customer references. KCP&L and/or the implementer will conduct QA/QC of a random group of completed projects by project type and contractor. The QA/QC process will include verification of the equipment installed and customer satisfaction with the contractor and the program.

A number of steps will be taken to reduce free ridership and increase spillover, including:

- Incentives will be modified as needed to respond to the market price of qualifying measures, with a goal of the incentive being no higher than 50% of the incremental cost.
- KCP&L will work with the implementer to properly set the rebate levels to ensure customers have adequate buy-in to the program.
- Cross-market the program with KCP&L's other Residential DSM Programs.
- Encourage customers to participate in all three options.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions using the change process identified in the tariffs. Incentives may be modified to account for new installation versus retrofit.

Customers receive the home energy audit and direct measure installation either free or for a minimal cost.

Option 2 Incentive per Unit

Measure	Unit	Incentive per Unit
Air Sealing	per sq. ft.	$0.08-$0.10, up to $300
Ceiling Insulation, R-38	per sq. ft.	$0.30-$0.35, up to $500
Wall Insulation, R-5	per sq. ft.	$0.65-$0.70, up to $150
ENERGY STAR® Windows	per window	$75, up to $750

Option 3 Incentive per Unit

Measure	Unit	Replace/ New	Early Retirement	Replace Electric Resistance Heat
Heat Pump Water Heater	per Unit	$500-550	n/a	n/a
ECM Furnace Fan	per Unit	$150-200	n/a	n/a
Heat Pump Ductless Mini-Split	per Unit	$300-350	n/a	n/a
SEER ≥15 Central Air Conditioner	per Unit	$125-175	$250-300	n/a
SEER ≥16 Central Air Conditioner	per Unit	$200-250	$400-450	n/a
SEER ≥15, HSPF ≥8.5 Heat Pump	per Unit	$150-200	$300-350	$800-850
SEER ≥16, HSPF ≥8.5 Heat Pump	per Unit	$300-350	$600-650	$1,000-1,050
SEER ≥17, HSPF ≥8.6 Heat Pump	per Unit	$500-550	$900-950	$1,200-1,250

Bonus Incentive per Customer

Requirements	Bonus Incentive

Air Sealing and ENERGY STAR® Windows	$300-350
Option 2 + CAC/HP	$100-150
Option 2 + Early Retirement CAC/HP	$150-200
Option 2 + HP Replace Electric Resistance	$200-250

Estimated Participation

The analysis assumed the square feet of a customer home in order to calculate estimate number of participants

Estimated Incremental Customer Participation

Measure	PY1	PY2	PY3
Home Audit & Direct Install	1,200	1,800	2,200
Air Sealing	490	734	898
Ceiling Insulation, R-38	184	275	337
Wall Insulation, R-5	24	37	45
ENERGY STAR® Windows	60	90	110
Heat Pump Water Heater	40	60	60
ECM Furnace Fan	12	18	18
Heat Pump Ductless Mini-Split	40	65	65
SEER ≥15 Central Air Conditioner	70	125	150
SEER ≥15 Central Air Conditioner, Early Retirement	15	28	35
SEER ≥16 Central Air Conditioner	35	55	70
SEER ≥16 Central Air Conditioner, Early Retirement	7	12	15
SEER ≥15, HSPF ≥8.5 Heat Pump	25	40	55
SEER ≥15, HSPF ≥8.5 HP, Early Retirement	4	8	10
SEER ≥15, HSPF ≥8.5 HP, Replace Electric Resistance Heat	6	12	20
SEER ≥16, HSPF ≥8.5 Heat Pump	15	25	35
SEER ≥16, HSPF ≥8.5 HP, Early Retirement	2	4	5
SEER ≥16, HSPF ≥8.5 HP, Replace Electric Resistance Heat	3	6	8
SEER ≥17, HSPF ≥8.6 Heat Pump	4	7	9

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings. The average savings per customer for the Option 1 Home Audit is a planning estimate, actual customer savings will vary.

Projected Net Savings per Measure

Measure	Unit	Net kWh Savings per Unit	Net kW Savings per Unit
Home Audit & Direct Install	per Home	592	0.062
Air Sealing	per sq. ft.	0.23	0.0001
Ceiling Insulation, R-38	per sq. ft.	0.52	0.0003
Wall Insulation, R-5	per sq. ft.	0.72	0.0004
ENERGY STAR® Windows	per sq. ft.	2.05	0.0008
Heat Pump Water Heater	per unit	1,766	0.084
ECM Furnace Fan	per unit	608	0.340
Heat Pump Ductless Mini-Split	per ton	1,315	0.817
SEER ≥15 Central Air Conditioner	per ton	150	0.089
SEER ≥15 Central Air Conditioner, Early Retirement	per ton	486	0.234
SEER ≥16 Central Air Conditioner	per ton	210	0.089
SEER ≥16 Central Air Conditioner, Early Retirement	per ton	547	0.234
SEER ≥15, HSPF ≥8.5 Heat Pump	per ton	173	0.054
SEER ≥15, HSPF ≥8.5 HP, Early Retirement	per ton	2,222	0.891
SEER ≥15, HSPF ≥8.5 HP, Replace Electric Resistance Heat	per ton	4,720	1.765

SEER ≥16, HSPF ≥8.5 Heat Pump	per ton	234	0.054
SEER ≥16, HSPF ≥8.5 HP, Early Retirement	per ton	2,283	0.891
SEER ≥16, HSPF ≥8.5 HP, Replace Electric Resistance Heat	per ton	4,780	1.765
SEER ≥17, HSPF ≥8.6 Heat Pump	per ton	321	0.093

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
1,557	2,474	3,063	0.42	0.69	0.86

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery			
Administration			
Education & Marketing			
Evaluation			
Total			

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Income-Eligible Multi-Family

Goal	Deliver long-term energy savings and bill reductions to income-eligible customers in multi-family housing and multi-family common area energy savings.
Target Market	Income-eligible residential homeowners and renters that are below 200% of the Federal poverty level and reside in multi-family housing as well as multi-family buildings with income-eligible residents.
Description	The program includes two tiers: **Tier 1. Multi-Family Kits.** Direct installation of low-cost measures for income-eligible homeowners and renters in multi-family housing, at no cost to the participant. The measures installed include: faucet aerator, low-flow showerhead, advanced power strip, hot water pipe insulation and LEDs. **Tier 2. Multi-Family Common Areas.** Installation of lighting measures in multi-family common areas, at no cost to the participant, and custom measures rebated at $0.12 per kWh saved. Additionally, KCP&L will distribute efficient CFL light bulbs at no cost to local food banks (LED bulbs will be offered in 2019).
Implementation Strategy	KCP&L will engage a third-party implementer to: • Identify and establish relationships with multi-family building owners that have a number of income-eligible residents. • Engage customers and schedule appointments. • Establish relationships with local food banks that provide services to KCP&L customers. • Track program performance. • Periodically report progress toward program goals and opportunities for improvement. KCP&L will work with the implementer to market the program to income-eligible customers and multi-family building owners utilizing the following approaches: • Direct outreach to customers, including bill inserts, direct mail, bill messaging, community events and community organizations. • Engage building owners to promote awareness of and use of the program. The implementer framework will include providing owners of multi-family buildings with a single point of contact or Coordinator for in-unit and common area/building system measures. The Coordinator's duties could include: • Determining eligibility and ensuring eligible customers are aware of the available incentives from all utilities. • Assisting in the application process for the Company's residential and business improvements. In addition, where other utilities are participating, assisting with those applications. • Providing a seamless point of contact for navigating the various incentive offers provided by the Company and other utilities serving the customer (*e.g.,* water, gas, etc.). • Maintaining a relationship with the existing business trade ally network and providing information and guidance to assist them with the bid process for installation work. • Understanding and maintaining a network of assistance agencies and making referrals for financing and repairs, seeking to remove barriers to participation. • Providing case studies and education, and working with business development teams to ensure proper outreach is occurring. • Coordinating marketing materials to provide an easy to understand process for participation. • Maintaining working relationships with and providing outreach and education to stakeholders such as lenders, Kansas social service agencies, and other identified parties. The program targets an underserved market that may not participate in other DSM programs

due a lack of funds or awareness. The program will encourage building managers and owners to continue improving building energy efficiency via the KCP&L's Business DSM Programs.

Risk Management

The program focuses on providing energy efficiency services to income-eligible residents to ensure reduced consumption. There is little risk associated with this product.

Measures & Incentives

The multi-family unit kits and common area lighting measures are installed free of charge. Custom common area incentives are $0.12 per kWh saved. KCP&L will distribute CFLs (LEDs in 2019) to local food banks at no cost to the customer.

Estimated Participation

The analysis assumed that a customer would purchase/receive six light bulbs, on average.

Estimated Incremental Participation

	PY1	PY2	PY3
Multi-family Units	50	100	150
Common Areas	10	20	30
CFL/LEDs	12,500	10,000	7,500

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings. The average savings per dwelling/building are planning estimates, actual savings will vary.

Projected Net Savings per Unit

Measure	Unit	Net kWh Savings per Unit	Net kW Savings per Unit
Multi-family Units	per Dwelling	476	0.044
Common Areas	per Building	5,088	0.914
CFLs	per Bulb	28	0.0029
LEDs	per Bulb	32	0.0033

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
2,197	1,848	1,682	0.232	0.200	0.182

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Income-Eligible Weatherization

Goal	Deliver long-term energy savings and bill reductions to income-eligible customers.
Target Market	Income-eligible residential homeowners and renters that are below 200% of the Federal poverty level.
Description	The program includes two tiers: **Tier 1. Kits.** Direct installation of low-cost measures for income-eligible homeowners and renters, at no cost to the participant. The measures installed include: faucet aerator, low-flow showerhead, advanced power strip, hot water pipe insulation, hot water heater tank wrap and LEDs. **Tier 2. Weatherization.** Installation of ceiling, duct and/or wall insulation, at no cost to the participant. Customers work with local community action agency to participate.
Implementation Strategy	KCP&L will engage a third-party implementer to: • Engage customers and schedule appointments. • Install measures. • Track program performance. • Periodically report progress toward program goals. KCP&L will work with the implementer to market the program to income-eligible customers utilizing bill inserts, direct mail, bill messaging, community events and community organizations. The program targets an underserved market that may not participate in other DSM programs due a lack of funds.
Risk Management	The program focuses on providing energy efficiency services to income-eligible residents to ensure reduced consumption. There is little risk associated with this product.
Measures & Incentives	All measures are installed free of charge. There are no monetary incentives.
Estimated Participation	**Estimated Incremental Customer Participation** (see table below)
Projected Energy & Demand Savings Target	A NTG ratio of 1.0 was applied to the energy and demand savings. The average savings per customer is a planning estimate, actual savings will vary. (see tables below)

Estimated Incremental Customer Participation

PY1	PY2	PY3
25	25	25

Projected Net Savings per Unit

Measure	Unit	Net kWh Savings per Unit	Net kW Savings per Unit
Kits	per Home	842	0.0877
Ceiling Insulation	per sq. ft.	0.52	0.0003
Duct Insulation	per Home	210	0.1178
Wall Insulation	per sq. ft.	0.72	0.0004

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
28	28	28	0.01	0.01	0.01

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Residential Programmable Thermostat

Goal	Decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours.
Target Market	Individually metered residential customers. Target primarily single family homeowners, expanding into multi-family as the single family market opportunities begin to saturate.
Description	The Residential Programmable Thermostat Program reduces peak demand by controlling participant cooling equipment during periods of system peak demand and when there may be delivery constraints within certain load zones. This is done by way of a remotely communicating, programmable thermostat. During a program event, the program operations center sends a radio frequency signal (for existing thermostats or Wi-Fi signal for new installations) to the thermostat to adjust its set-point by two to four degrees Fahrenheit such that the system will consume less energy and run less frequently throughout the maximum four-hour event duration. One method of participation will be for customers to receive the thermostat and professional installation (a $350 value) for free upon qualification and enrollment in the program. Alternatively, customers could sign up and upon qualification receive a free thermostat that can be self-installed and verified once connected to homeowner's Wi-Fi.
Implementation Strategy	KCP&L will engage a third-party implementer to: • Hire/sub-contract local staff to install the programmable thermostats. • Engage customers, schedule installation appointments and process customer incentives. • Provide customer service support. • Track program performance and event data. • Periodically report progress toward program goals and opportunities for improvement. Events will typically occur between June 1 and September 30, Monday to Friday. Event duration is a maximum of four hours per day. Customers may opt of any curtailment event. The program will be marketed through direct contact with consumers using bill inserts, newsletters, website, broadcast and print media, and direct mail. There is not a direct relationship with KCP&L's other DSM Programs; however, the program will be cross-marketed with KCP&L's Residential DSM Programs and Whole House Efficiency participants that purchase a new HVAC system will be made aware of the program.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO (regional transmission organization), thereby reducing the utility system peak, required capacity, and also the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Having the thermostats available as a resource year-round is potentially of value to system operations in the event of plant maintenance or other grid events. Curtailment in participating homes with electric heat could provide additional risk management capabilities in the future in the case of an extreme event in off season or winter months. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants.
Measures & Incentives	Customers receive a free communicating, programmable thermostat with installation (a $350 value) for joining the program. The customer receives a $25 incentive per year they participate in the program (beginning the second year). Incentives were set for planning

purposes and may be modified to reflect market conditions using the change process identified in the tariffs.

Estimated Participation

Estimated Incremental Customer Participation

PY1	PY2	PY3
5,333	5,333	5,334

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings.

Projected Net Savings per Thermostat

Unit	Net kWh Savings per Unit	Net kW Savings per Unit
per Thermostat	462	1.26

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
2,464	2,464	2,464	6.72	6.72	6.72

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery			
Administration			
Education & Marketing			
Evaluation			
Total			

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Business Programs

KCP&L's Business DSM programs serve commercial and industrial customers, encouraging investment in energy management and energy efficient measures such as lighting, HVAC equipment and motors.

Business Energy Efficiency Rebate - Standard

Goal	Encourage purchase and installation of energy efficient equipment.
Target Market	All commercial and industrial customers as well as trade allies.
Description	The Business Energy Efficiency Rebate – Standard is designed to help commercial and industrial customers save energy through a broad range of energy efficiency options that address all major end uses and processes. The program will offer standard rebates as well as mid-stream incentives. The measures incentivized, including lighting, HVAC equipment and motors, are proven technologies that are readily available with known performance characteristics. • Standard Rebates: Participants select energy efficient equipment from a pre-qualified list. Rebates are issued to participants upon completion of the project and submission of the rebate application. • Mid-Stream Incentives: trade allies receive incentives for increasing the sale of qualifying measures. Measures that are incentivized mid-stream will not be offered as a standard rebate. Standard participant rebates per program year are limited to the annual cap outlined in the tariff and on KCP&L's website and applications.
Implementation Strategy	KCP&L will engage a third-party implementer to: • Process customer applications, verify eligibility and process customer rebates. • Conduct QA/QC to verify equipment installation. • Provide customer service support. • Track program performance. • Periodically report progress toward program goals and opportunities for improvement. Key pillars of the marketing strategy will include trade allies and direct customer marketing, including direct mail, newspaper advertisements, email blasts, bill inserts and HVAC trade publications. Additional marketing tactics will include: • Education: Train and educate trade allies on the programs and how to effectively sell the program to customers. • Incentives: Provide incentives to trade allies that successfully increase the sale of qualifying measures to customers within the KCP&L-KS service territory. • Trade Associations: Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KCP&L will coordinate with specific associations to highlight suitable program offerings. • Highlight successfully completed projects: KCP&L will select projects to display the process and benefits of the program. This type of marketing will spur the customer's competitors to improve building performance and increase business process efficiency. The program will be cross-marketed with KCP&L's Business DSM Programs, particularly the Business Energy Efficiency Rebate – Custom Program.
Risk Management	The key barriers are return on investment, decision timing and customer internal funding and approval processes. Another barrier is ensuring that enough vendors are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements. Measure savings are expected to be updated annually. Potential changes to measure savings,

costs, and other key assumptions could affect the measure's ability to pass cost-effectiveness tests. Therefore, the mix of measures that can be offered could change from year to year to reflect changes made to the original measure attributes.

Incentives will be modified as needed to respond to market prices, with a goal of the incentive being no higher than 50% of the incremental cost. Proper incentives can reduce free ridership while still encouraging customers to participate in the program.

Measures & Incentives

The measures and incentives were set for planning purposes and may be modified to reflect market conditions using the change process identified in the tariffs. Additional measures included in the Company TRM and incentive range documents may also be offered.

Measure	Unit	Incentive per Unit
Air Source AC	per ton	$50
Air Source HP <135 kBtuh	per ton	$60
ECM Motors Walk-In Coolers & Freezers	per unit	$30
ENERGY STAR® Beverage Machine	per unit	$75
Heat Pump Water Heater	per unit	$500
Low Flow Faucet Aerator	per unit	$2.50
Packed Terminal AC/HP	per ton	$5.00
Pipe Wrap/Insulation	per unit	$15
Pumps/Fan, VSD (HVAC only)	per HP	$220
Reach In Refrigerator/Freezer	per unit	$100
Strip Curtains	per unit	$125
Advanced Rooftop Unit Controls	per unit	$100
Compressed Air - Engineered Nozzle	per unit	$20
Compressed Air - No Loss Condensate Drain/Valve	per unit	$200
High Volume Low Speed Fans	per unit	$1,000
Variable Speed Drive Compressor	per unit	$60
Variable Speed ECM Pump	per unit	$200-900
Pre-Rinse Spray Valves	per unit	$40
25W - 4 ft. fluorescent T8 lamp	per unit	$1.25
28W - 4 ft. fluorescent T8 lamp	per unit	$0.50
Directional LED Bulb	per unit	$15-25
Exterior LED replacing HID	per unit	$150-300
High Bay Fluorescent Fixture (HP T8 >4ft)	per unit	$115
High Bay Fluorescent Fixture w/ HE Electronic Ballast	per unit	$45-75
LED 1X4 Retrofit Kit or Troffer/Linear Ambient	per unit	$75
LED 2X2 Retrofit Kit or Troffer/Linear Ambient	per unit	$65
LED 2X4 Retrofit Kit or Troffer/Linear Ambient	per unit	$70
LED Downlight/Retrofit Kit	per unit	$15-45
LED Exit Sign	per unit	$12
LED High & Low-Bay Fixture	per unit	$75
LED High Bay	per unit	$215-363
LED Linear Replacement Lamp	per unit	$10
LED Low Bay	per unit	$153-165
LED Refrigerated/Freezer Case Lights	per unit	$100
Lighting Optimization	per unit	$10
Low Wattage T8 Lamp	per unit	$1.00
Omnidirectional LED Bulb	per unit	$10-15
Parking Garage 4'1L T5, T5HP, or T8	per unit	$40-60
Parking Garage LED	per unit	$150-250

Screw In - CFLs	per unit	$1.00

Estimated Participation

Estimated Incremental Participation

Measure	PY1	PY2	PY3
Air Sourced Air Conditioner <65 kBtuh	5	5	5
Air Sourced Air Conditioner 65<135 kBtuh	14	15	16
Air Sourced Air Conditioner 135<240 kBtuh	10	11	12
Air Sourced Air Conditioner >240 kBtuh	2	2	2
Air Source Heat Pump <65 kBtuh	6	6	6
Air Source Heat Pump 65<135 kBtuh	5	5	5
ECM Motors Walk-In Coolers & Freezers	40	42	44
ENERGY STAR® Beverage Machine	79	83	87
Heat Pump Water Heater	9	9	9
Low Flow Faucet Aerator	10	11	12
Packed Terminal AC/HP	11	12	13
Pipe Wrap/Insulation	130	137	144
Pumps/Fan, VSD (HVAC only)	27	28	29
Strip Curtains	116	122	128
Advanced Rooftop Unit Controls	8	8	8
Directional LED Bulb	80	84	88
Exterior LED replacing HID	12	12	12
High Bay Fluorescent Fixture (HP T8 >4ft)	10	11	12
High Bay Fluorescent Fixture w/ HE Electronic Ballast	90	95	100
LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	4	4	4
LED 1X4 Troffer/Linear Ambient replacing T8, T12 or T5/T5HO	4	4	4
LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	8	8	8
LED 2X2 Troffer/Linear Ambient replacing T8, T12 or T5/T5HO	8	8	8
LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	20	21	22
LED 2X4 Troffer/Linear Ambient replacing T8, T12 or T5/T5HO	20	21	22
LED Downlight/Retrofit Kit	24	24	24
LED Exit Sign	60	63	66
LED High & Low-Bay Fixture	60	63	66
LED Refrigerated/Freezer Case Lights (4, 5, and 6-foot)	36	38	40
Lighting Optimization	80	84	88
Omnidirectional LED Bulb	80	84	88

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings.

Projected Net Savings per Unit

Measure	Unit	Net kWh	Net kW
Air Sourced Air Conditioner <65 kBtuh	per ton	82	0.07
Air Sourced Air Conditioner 65<135 kBtuh	per ton	57	0.05
Air Sourced Air Conditioner 135<240 kBtuh	per ton	81	0.07
Air Sourced Air Conditioner >240 kBtuh	per ton	71	0.06
Air Source Heat Pump <65 kBtuh	per ton	158	0.19
Air Source Heat Pump 65<135 kBtuh	per ton	91	0.12
ECM Motors Walk-In Coolers & Freezers	per unit	401	0.04
ENERGY STAR® Beverage Machine	per unit	1,752	0.12
Heat Pump Water Heater	per unit	2,004	0.29
Low Flow Faucet Aerator	per unit	131	0.20
Packed Terminal AC/HP	per ton	30	0.01
Pipe Wrap/Insulation	per unit	224	0.28
Pumps/Fan, VSD (HVAC only)	per HP	485	0.14
High Efficiency Reach-In Refrigerator/Freezer	per unit	3,026	0.13
Strip Curtains	per unit	1,698	0.19
Advanced RTU Controls, 2000-4000 annual occupancy	per ton	420	0.15
Advanced RTU Controls, >4000 annual occupancy	per ton	700	0.15
Compressed Air - Engineered Nozzle 1/4"	per unit	1,087	0.51
Compressed Air - Engineered Nozzle 1/8"	per unit	393	0.16
Compressed Air - No Loss Condensate Drain/Valve	per unit	1,970	0.30
High Volume Low Speed Fans (20ft Diameter)	per unit	6,577	2.40
High Volume Low Speed Fans (22ft Diameter)	per unit	8,543	3.10
High Volume Low Speed Fans (24ft Diameter)	per unit	10,018	3.70
VSD Compressor - 1 shift weekdays	per HP	329	0.16
VSD Compressor - 2 shift weekdays	per HP	658	0.16
VSD Compressor - 3 shift weekdays	per HP	987	0.16
VSD Compressor - 3 shift weekdays plus weekends	per HP	1,385	0.16
Variable Speed ECM Pump, <100 Watts Max, DHW Recirculation	per unit	1,312	0.23
Variable Speed ECM Pump, 100 – 500 Watts Max, DHW Recirculation	per unit	6,555	1.14
Variable Speed ECM Pump, >500 Watts Max, DHW Recirculation	per unit	26,221	4.56
Variable Speed ECM Pump, <100 Watts Max, Circulation	per unit	359	-
Variable Speed ECM Pump, 100 – 500 Watts Max, Circulation	per unit	1,794	-
Variable Speed ECM Pump, >500 Watts Max, Circulation	per unit	7,174	-
Pre-Rinse Spray Valves	per unit	2,671	0.32
25W - 4 ft. fluorescent T8 lamp	per unit	36	0.01
28W - 4 ft. fluorescent T8 lamp	per unit	18	0.00
Directional LED Bulb (<15W)	per unit	144	0.03
Directional LED Bulb (≥15W)	per unit	231	0.05
Exterior LED replacing <175W HID	per unit	490	-
Exterior LED replacing 175-250W HID	per unit	602	-
Exterior LED replacing 251-400W HID	per unit	1,191	-
Exterior LED replacing >400W HID	per unit	2,662	-
High Bay Fluorescent Fixture (HP T8 >4ft)	per unit	1,084	0.22

High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4ft)	per unit	701	0.14
High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4ft)	per unit	405	0.08
LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	per unit	200	0.05
LED 1X4 Troffer/Linear Ambient replacing T8, T12 or T5/T5HO	per unit	210	0.05
LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	per unit	195	0.04
LED 2X2 Troffer/Linear Ambient replacing T8, T12 or T5/T5HO	per unit	205	0.05
LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	per unit	258	0.06
LED 2X4 Troffer/Linear Ambient replacing T8, T12 or T5/T5HO	per unit	258	0.06
LED Downlight or Retrofit Kit ≤ 13W	per unit	195	0.04
LED Downlight or Retrofit Kit 14 to 21W	per unit	322	0.07
LED Downlight or Retrofit Kit ≥ 22W	per unit	512	0.11
LED Exit Sign	per unit	79	0.01
LED High & Low-Bay Fixture	per unit	587	0.12
LED Linear Lamp Replace a 4' T8, T12, or T5 lamp	per unit	54	0.01
LED Linear Lamp replacing a 2-ft T8, T12 or T5 lamp	per unit	35	0.01
LED Refrigerated Case Lights (4, 5, and 6-foot)	per unit	595	0.14
LED Freezer Case Lights (4, 5, and 6-foot)	per unit	641	0.15
LED High Bay 111-175W	per unit	1,712	0.31
LED High Bay 176-350W	per unit	4,483	0.81
LED Low Bay 30-70W	per unit	807	0.15
LED Low/High Bay 71-110W	per unit	1,096	0.20
Lighting Optimization - Remove 4ft Lamp from T8 System	per unit	122	0.02
Lighting Optimization - Remove 8ft Lamp from T8 System	per unit	253	0.05
Low Wattage T8 Lamp	per unit	26	0.01
Omnidirectional LED Bulb (<10W)	per unit	84	0.02
Omnidirectional LED Bulb (≥10W)	per unit	130	0.03
Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	per unit	613	0.07
Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	per unit	981	0.11
Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	per unit	902	0.10
Parking Garage LED replacing ≤ 100W HID	per unit	613	0.07
Parking Garage LED replacing 101W-175W HID	per unit	981	0.11
Parking Garage LED replacing >175W HID	per unit	902	0.10
Screw In - CFLs	per unit	175	0.01

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
7,624	8,018	8,412	1.68	1.77	1.86

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery			
Administration			
Education & Marketing			
Evaluation			
Total			

Cost-Effectiveness	**Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.**

Business Energy Efficiency Rebate - Custom

Goal	Encourage purchase and installation of energy efficient equipment by providing incentives to lower the cost of purchasing efficient equipment for commercial and industrial facilities.
Target Market	All commercial and industrial customers.
Description	The program is designed to help commercial and industrial customers save energy through a broad range of energy efficiency options that address all major end uses and processes. Equipment that does not qualify for a standard rebate as described in the Standard Rebate measures will be eligible to apply for a custom rebate. Applications must be pre-approved by KCP&L before equipment is purchased and installed and must have a Total Resource Cost (TRC) Test benefit-cost ratio of at least 1.0. Incentives, up to 50% of the project cost, were included as: • \$0.10 per first-year-kWh saved for all incentives Participant rebates per program year are limited to the annual cap outlined in the tariff on the Company website and applications. Multiple rebate applications for different measures may be submitted. Rebates will be issued upon completion of the project. Customers may apply to use funds for Building Operator Certification training. KCP&L and the implementer will work with customers interested in combined heat and power (CHP) projects to determine project costs, cost-effectiveness, tax credits, and financing options. For purposes of the analysis, the incentive payment for CHP projects is determined to be \$300 per kW of installed electric generation capacity and the annual cap criteria will be reviewed and determined on a case-by-case basis and based upon available program funding.
Implementation Strategy	KCP&L will engage a third-party implementer to: • Process customer applications, verify eligibility, review pre-approval applications, and process customer rebates. • Conduct QA/QC to verify equipment installation. Randomly inspect 10% of projects and all projects over a threshold determined by KCP&L (*e.g.*, \$10,000). • Provide customer service support. • Track program performance. • Periodically report progress toward program goals and opportunities for improvement. Key pillars of the marketing strategy will include trade allies and direct customer marketing, including direct mail, newspaper advertisements, email blasts, bill inserts and HVAC trade publications. Additional marketing tactics will include: • Education: Train and educate trade allies on the programs and how to effectively sell the program to customers. • Trade Associations: Businesses rely on trade associations to represent industry's best interests in lobbying, growth, and identification of business opportunities. KCP&L will coordinate with specific associations to highlight suitable program offerings. • Highlight successfully completed projects: KCP&L will select projects to display the process and benefits of the program. This type of marketing will spur the customer's competitors to improve building performance and increase business process efficiency. The program will be cross-marketed with KCP&L's Business DSM Programs, particularly the Business Energy Efficiency Rebate – Standard Program.
Risk Management	The key barriers are return on investment, decision timing and customer internal funding and approval processes. Another barrier is ensuring that enough vendors are properly educated to allow them to actively engage customers by explaining the myriad benefits of efficiency improvements.

Measures & Incentives

Incentives were set for planning purposes and may be modified to reflect market conditions using the change process identified in the tariffs. Incentives, up to 50% of the project cost and up to a maximum annual cap, are:

- $0.12-0.19 per kWh saved for all incentives

Estimated Participation

Estimated Incremental Participating Businesses

PY1	PY2	PY3
250	600	800

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings. The average savings per customer is a planning estimate, actual savings will vary.

Projected Net Savings per Customer

Net kWh Savings per Customer	Net kW Savings per Customer
4,679	1.297

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
1,170	2,807	2,339	0.32	0.78	0.65

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Strategic Energy Management

Goal	Provide energy education, technical assistance, and company-wide coaching to large commercial and industrial customers to drive behavioral change and transformation of company culture with respect to energy use and management.
Target Market	Customers with high energy use and operational sophistication. The best candidates are likely to have the following attributes: • Large manufacturing companies or commercial facilities with >300 kW peak demand. • Companies and institutional customers with multiple sites (*i.e.*, operations/offices in another state or country). • Customers with commitment to sustainability and environmental stewardship. • Customers in regulated industries. • Companies that have well established management systems like quality/safety or those using continuous improvement practices. • Companies in a stable or rapid growth mode.
Description	The Strategic Energy Management (SEM) Program is a systematic approach to delivering persistent energy savings to organizations by integrating energy management into regular business practices. The program involves appointment of an energy liaison(s) and a team within participating organizations who regularly correspond with program representatives. The program includes two program tracks that use different delivery mechanisms: *One-on-One Consultative Strategic Energy Management (Consultative SEM)* provides the customer with access to an energy expert who works intensively with the customer to integrate energy management into the organization's business practices by helping the customer set up an energy management process and implement improvements. The participant receives frequent and personalized attention throughout the implementation period. Touch points and milestones are agreed upon between the two parties. *Strategic Energy Management Cohort (SEM Cohort)* places companies into groups that work alongside each other for one year or longer, coming together in periodic workshops, approximately quarterly, and working on their own between the sessions. The group setting enhances participant action as they strive to perform in front of their peers. Structured groups are composed of 5 to 12 participants that are often located in the same geographical area, sharing best practices and learning together. The group is typically filled with participants from non-competing industries; however, if mutual agreement is established, competitors may participate in the same group. A methodology is developed early in the engagement to forecast each participant's baseline energy consumption from which savings goals are created and measured. To isolate energy savings attributable to SEM efforts, any savings from equipment measures installed under other programs in the portfolio can be netted out of these savings. SEM has been shown to produce larger and longer lasting energy savings when compared to other energy management offerings. Few customers, however, have the internal resources to pursue and sustain these initiatives on their own, without the support of a utility program.
Implementation Strategy	The design relies on a Program Administrator and Energy Management Providers. *Program Administrator*: KCP&L staff and a third-party implementer to deliver the program and manage administrative functions, such as marketing, customer recruitment, and results tracking. *Energy Management Providers*: Firms and personnel with specific knowledge and expertise who work with customers to achieve savings. The Energy Management Provider must have a combination of the following: • Experience in customer consulting and change management.

- Experience with continuous improvement methodologies.
- Experience engaging customer personnel at all levels, particularly executives.
- Experience using and deploying management systems such as quality, environmental impact, and safety.
- Technical expertise for understanding production process and operations to identify energy savings opportunities.
- Established track record deploying utility-based SEM programs, driving energy savings along with customer change and customer satisfaction.

Program delivery will be integrated with other Business DSM programs. Customers that have already completed or are currently participating in the Business Energy Efficiency Rebate Programs can achieve additional efficiency gains. If capital measures are identified during the course of participation in SEM, they can be submitted for incentives under the appropriate Business Energy Efficiency Rebate Program.

The Program Administrator recruits customers through one-on-one contacts. To achieve goals, the program will likely need to target two to three times the participation goal. The recruitment process will build an SEM pipeline, wherein potential participants can be monitored as their priorities and business situations change over time. One-on-one recruiting builds familiarity and trust, providing the basis for successful engagements.

Recruit Customers. Recruiting requires a two-prong approach at both the facility management level and executive level. KCP&L should leverage relationships with large customers and peer relationships that KCP&L executives have with customer executives.

Screen Customers. Potential participants will be screened on the size of their connected load and on factors including history of implementing energy efficiency projects, experience with other continuous improvement programs, general responsiveness of plant personnel, etc. Screening will take place through discussions with account managers and preliminary conversations with prospective participants.

Gain Customer Commitment. As part of the screening process, participating customers will commit to an on-site executive-level sponsor, dedicated program budget, access to key human resources, inclusion of an energy continuous improvement statement within existing corporate goals, and a training program for new and existing personnel.

An Energy Management Provider will be assigned to each participant and have primary responsibility for implementing the program and working with the participant. The Energy Management Provider will have three roles:

Project Manager. Coordinate customer communication and meetings, develop reports.

Organizational Facilitator(s). Conduct initial Energy Management Assessment, provide ongoing customer coaching, maintain customer satisfaction, and provide input to energy maps and savings models. Identify and cultivate an energy champion or team leader.

Savings Modeler. Develop energy maps and savings models. Provide technical assistance to participating customers to understand current energy use, identify opportunities to reduce energy use, and to set energy-use reduction goals.

The key marketing message should be that KCP&L is supporting customers to more strategically manage energy and to invest in their future by building an organizational foundation for energy management, providing consultative resources and incentives. Marketing will rely heavily upon presentations and letters, supported by brochures, case studies and success stories. It is important for the marketing materials to:

- Provide a basic understanding of the concept of SEM and the program.
- Outline the compelling business case (benefits and costs) of participation.
- Connect the SEM offering to the existing DSM portfolio.

Risk Management

The most challenging aspect of a SEM program is maintaining long-term customer commitment because it directly affects savings persistence. To ensure commitment, the customer must clearly understand the following:

- The level of staff time, management review, and other resources they are committing.
- The services, such as consulting and training, they will receive.
- The benefits, such as a more systematic and proactive approach to managing energy.

Successful efforts involve setting rigorous expectations through ongoing meetings with the participant, Energy Management Providers, Program Administrator and KCP&L staff.

Participating Customer and Program Administrator. To ensure the customer maintains momentum and arrives at an agreed upon success point, a stage-gate approach is recommended. This includes clearly defined stages based on progress indicators, such as the existence of an energy goal, consistent meetings of an energy team, and the engagement of employees in energy awareness.

Program Administrator, Energy Management Provider(s) and KCP&L. A periodic review meeting on a quarterly basis brings together KCP&L staff, the Program Administrator, and the Energy Management Provider(s) to discuss each participant with respect to successes, challenges, and overall progress. If it is determined that a customer's progress is lagging, they will agree to next steps, including increased engagement scope and discussions with the customer to ensure that they understand program support may be withdrawn if they do not improve performance.

Working with customers' energy and production data is vital to the tracking of progress in this program. The data are frequently proprietary and competition-sensitive, so steps must be taken to establish a secure mechanism and procedure for sharing and storage of data.

Measures & Incentives

Behavioral and operational energy savings, as measured relative to the participant's personal baseline consumption, are paid incentives of $0.02 per first-year-kWh saved. These levels were set for planning purposes and may be modified to reflect market conditions through the change process identified in the tariff.

Separately, capital measures that are adopted due to participation in the SEM program, and which are eligible for incentives under other programs such as the Business Energy Efficiency Rebate – Standard and Custom – initiatives, are routed through those programs and receive the applicable incentives as if they were regular projects. These savings are netted out of the SEM savings and recorded under the Standard or Custom programs. In this way, SEM also becomes a lead generator for other programs and further drives portfolio success.

Estimated Participation

Estimated Incremental Participating Businesses

PY1	PY2	PY3
8	8	8

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings. The average savings per customer is a planning estimate, actual program savings will vary widely.

Projected Net Savings per Customer

Net kWh Savings per Participating Business	Net kW Savings per Participating Business
139,728	36.709

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
1,118	1,118	1,118	0.29	0.29	0.29

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery			
Administration			
Education & Marketing			
Evaluation			
Total			

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Block Bidding

Goal	Encourage high-volume energy savings projects from customers and third-party suppliers working on behalf of customers at lower cost than traditional programs. This program provides an opportunity to organize and procure non-conventional projects that may not be eligible or appropriately incentivized to participate in other programs.
Target Market	Any commercial, industrial or municipal customer as well as third-party suppliers, such as energy service companies, trade allies and performance contractors.
Description	The Block Bidding Program seeks to purchase blocks of electric energy and demand savings by issuing a Request For Proposal (RFP) to eligible customers and third-party suppliers. The RFP details the proposal requirements as well as the electric energy and demand savings that must be achieved. Customers and/or third parties submit proposals to deliver the requested block of cost-effective electric energy and demand savings. The electric energy and demand savings may be achieved in a variety of ways; for example, one customer facility installing energy efficiency equipment or a bundle of projects across multiple sites and/or customers. Bidder proposals are reviewed to: • Verify customer eligibility. • Ensure completeness and accuracy of proposed electric energy and demand savings. • Screen the proposed measures for cost-effectiveness. All projects must have a Total Resource Cost (TRC) Test benefit-cost ratio of greater than 1.0. Qualifying and cost-effective bidder proposals are ranked based upon the proposed cost per kWh saved ($/kWh). Program funds are awarded to bidders starting with the lowest $/kWh saved until the funding is depleted. KCP&L enters into contracts with the bidders that receive program funding. All projects must receive pre- and post-implementation inspections to verify the existing and upgraded equipment. The acquired savings may differ from the expected savings stated in the contract based upon actual performance and the post-implementation inspection.
Implementation Strategy	KCP&L staff will administer the Block Bidding Program with assistance from a third-party implementer. Implementer activities include: • Assist with outreach and education to potential bidders. • Review bidder proposals and recommend the bids to be funded. • Perform pre- and post-implementation inspections. • Provide customer service support. • Track program performance. • Periodically report progress toward program goals and opportunities for improvement. Marketing will be targeted to third-party suppliers and customers. Tactics will include: • Training sessions to educate third-party suppliers and customers on the program, proposal requirements and any associated paperwork requirements. • Direct outreach via KCP&L key account representatives, news releases, announcements, telephone calls and email. • Highlight successfully completed projects to display the benefits of the program. • Third-party suppliers will promote the program directly to eligible customers.
Risk Management	The most challenging aspect is engaging customers and the ability of customers to achieve the required blocks of electric energy and demand savings. The implementer and KCP&L staff must work closely to ensure potential bidders understand the program requirements and work to correct any issues or concerns that arise in bidder proposals. Customers must be made aware of the ability to bundle projects and/or work with a third-party supplier to achieve the required blocks of electric energy and demand savings. The implementer and

KCP&L staff must work closely with the contracted bidders to ensure projects are being completed in a timely fashion and issues are addressed in a timely fashion.

Measures & Incentives

Incentives of $0.06 per first-year-kWh saved were assumed for planning purposes, but the actual incentive payments will be a result of the individual project bids received during the RFP process. Program management can choose the threshold cost below which they are willing to pay based on the condition of budgets and energy and peak demand savings goals at the time the bids are received.

Estimated Participation

Estimated Incremental RFPs by Territory

PY1	PY2	PY3
1	1	1

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings.

Projected Net Savings per RFP

Net kWh Savings per RFP	Net kW Savings per RFP
2,514,850	436

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
2,515	2,515	2,515	0.44	0.44	0.44

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Online Business Energy Audit

Goal

Encourage energy education and conservation, as well as further engagement in the broader portfolio of DSM programs.

Target Market

Non-residential customers.

Description

The program provides customers access to a free online tool to analyze the energy efficiency of their businesses, educational materials regarding energy efficiency and conservation, and information on KCP&L DSM Programs.

The program goals include:

- Increase awareness of business and building energy consumption.
- Educate commercial customers about the benefits of energy efficiency and the opportunities to reduce energy consumption.
- Increase awareness of and participation in other KCP&L DSM programs.

Implementation Strategy

KCP&L will engage a third-party contractor to develop and maintain the online tool(s).

Risk Management

The Online Business Energy Audit Program is an educational program that informs customers of business energy consumption and methods to reduce energy usage. KCP&L will strategize ways to highlight the audit tool on the KCP&L website and increase customer engagement.

Measures & Incentives

There are no monetary incentives.

Estimated Participation

Program participation was not estimated for this program.

Projected Energy & Demand Savings Target

Program savings were not estimated for this program since it is deemed an educational program.

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

N/A

Small Business Direct Install

Goal	Provide targeted, highly cost-effective lighting measures to small and medium business customers in a quickly deployable program delivery mechanism.
Target Market	Small and medium business customers with an average electric demand of less than 100 kW per year. This program is not intended for a single customer owning multiple sites of the same business such as a national convenience store chain.
Description	The program offers customers a lighting energy assessment that includes information on potential energy savings and anticipated payback as well as incentives that cover up to 70% percent of the equipment and installation costs. Eligible measures include, but are not limited to, occupancy sensors, LED exit signs, and fluorescent lamps. The program works best if the assessment and any applicable equipment and measure installations can be completed in a short window of time, *e.g.,* within 1 to 2 weeks. KCP&L will select an implementer that will recruit, train, manage and authorize trade allies to provide the lighting audit, information on lighting incentives and execute project installation. The authorized trade ally will contract directly with the customer for project installation. Incentives will be assigned directly to the authorized trade ally, so that the value of utility incentives is reduced directly from the project cost. The program is part of a long-term strategy to raise awareness of energy savings opportunities among business customers and to help them take action using incentives offered by KCP&L.
Implementation Strategy	The implementation strategy will incorporate the following components: • ***Walk-Through Audits.*** Authorized trade allies complete a walk-through examination of the business using standard audit software, identifying specific energy saving lighting opportunities. The trade ally will review the anticipated costs and savings of the measures, along with information on financial resources available to help defray costs. Customers will be provided with a report, check list of recommendations from the audit and a proposal to execute the installation of recommendations. • ***Direct Installation of Measures.*** Upon customer approval of a job scope, the authorized trade ally will install pertinent lighting measures identified during the audit within a program determined window of time. • ***Customer Education.*** Customers will be educated on energy efficient equipment and KCP&L's full suite of Business DSM programs. Particular attention will be paid to the areas identified in the audit. KCP&L will hire an implementer to: • Manage qualified, local trade allies to conduct lighting energy audits and install efficient lighting equipment. Provide training, ongoing as needed. • Ensure that trade allies are familiar with all KCP&L DSM programs available to customers. • Assist with program marketing and outreach. • Provide customer service support. • Track program performance, including audit requests, audit activities and customer actions. • Periodically report progress toward program goals and opportunities for improvement. • Perform QA/QC of proposed and installed projects. The marketing and outreach strategies will include direct customer marketing such as bill inserts, newsletters, email, and on-bill messaging. The trade allies will market the program directly to customers. KCP&L will highlight successfully completed projects to display the benefits of the program. This program targets a very specific market that may have limited access to capital. However, the program will encourage customers to participate in other KCP&L Business DSM Programs.
Risk	Small business customers are typically a hard-to-reach market without the time available to

Management

become educated on energy efficient equipment and the money available to upgrade to efficient equipment.

One potential risk is a limited supply of qualified trade allies with the skills to conduct audits and market energy efficiency improvements. A solution is the development of a local network of qualified professionals to provide audit and installation services and to promote the program to customers. The implementer will:

- Offer technical training to trade allies, including classroom and field sessions.
- Offer sales and business process training to help trade allies succeed in selling and delivering energy efficiency services.

Measures & Incentives

Incentives were set for planning purposes and may be modified to reflect market conditions using the change process identified in the tariffs. Incentives cover up to 70% percent of the equipment and installation costs.

Estimated Participation

Estimated Incremental Participating Businesses

PY1	PY2	PY3
50	85	100

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the energy and demand savings.

Projected Net Savings per Customer

Net kWh Savings per Customer			Net kW Savings per Customer		
PY1	PY2	PY3	PY1	PY2	PY3
8,538	8,543	8,579	1.43	1.43	1.43

Projected Net Incremental Program Savings

Net MWh Savings			Net MW Savings		
PY1	PY2	PY3	PY1	PY2	PY3
427	726	858	0.07	0.12	0.14

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]		
Delivery	[redacted]		
Administration	[redacted]		
Education & Marketing	[redacted]		
Evaluation	[redacted]		
Total	[redacted]		

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

Demand Response Incentive

Goal	Decrease peak demand usage to provide system and grid relief during particularly high-load, high-congestion peak hours.
Target Market	Large commercial and industrial customers with load curtailment capability of at least 25 kW.
Description	The Demand Response Incentive Program provides firm contractual arrangements with customers for periodic curtailments at times of system peak demand. Customers enter into a contract for a one-, three- or five-year term and receive a payment/bill credit based upon the curtailable load, the contract term and number of consecutive years under contract. Participants receive notification of an event at least four hours prior to the start time.
Implementation Strategy	Curtailment events may occur between June 1 through September 30, Monday through Friday, between the hours of 12 pm and 10 pm (holidays excluded). Event duration is typically three to six hours per day for a maximum of 15 events per year. KCP&L key account executives will be vital to coordinating with the largest customers and gaining their participation and collaboration. The program will also be marketed through direct customer outreach as well as newsletters and direct mail. The program will promote KCP&L's Business DSM Programs to participating customers.
Risk Management	The primary benefit of demand response programs is to mitigate the risks and costs associated with system peak loads. From a planning perspective, using demand response resources in the most valuable way would imply that system planners would include the peak impacts in the load forecast nominated to the RTO, thereby reducing the utility system peak, required capacity, and also the reserve requirements. This also implies that events would primarily be called when the day-ahead forecast projects a load in excess of that nominated peak, rather than using another event trigger mechanism, such as energy market prices above a certain threshold or weather above a certain temperature. Providing the opportunity for customers to opt-out or override a limited number of events provides choice and control to the customer, minimizing the risk of attrition and lost participants.
Measures & Incentives	Customers receive a fixed, capacity-reserve payment in terms of $/kW, based on the number of curtailable kW, the contract term, and number of consecutive years under contract. The fixed payment is supplemented by a performance payment on a $/kWh basis, calculated from the customer's actual load curtailment relative to their baseline load, as calculated by program management.

Estimated Participation

Estimated Incremental Customer Participation

PY1	PY2	PY3
11	46	53

Projected Energy & Demand Savings Target

A NTG ratio of 1.0 was applied to the demand savings. There are no energy savings associated with the program.

Projected Net Savings per Customer

Net kW Savings per Customer
1.0

Projected Net Incremental Program Savings

Net MW Savings		
PY1	PY2	PY3
3.00	13.00	15.00

Estimated Program Budget

Start-up costs are included in Delivery.

Estimated Annual Budget **Confidential**

	PY1	PY2	PY3
Incentives	[redacted]	[redacted]	[redacted]
Delivery	[redacted]	[redacted]	[redacted]
Administration	[redacted]	[redacted]	[redacted]
Education & Marketing	[redacted]	[redacted]	[redacted]
Evaluation	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Cost-Effectiveness

Total Program Cycle Cost-Effectiveness - See Report Section 3D, Table 3-7.

APPENDIX B
CONTAINS CONFIDENTIAL INFORMATION NOT AVAILABLE TO THE PUBLIC
ORIGINAL FILED UNDER SEAL

APPENDIX | C

EM&V Plan and Timeline

The Company strives to provide useful, impactful and cost-effective programs. Ongoing analysis of program performance through Evaluation, Measurement & Verification (EM&V) is an important aspect to that end. The main objective of an EM&V process is to assess the performance of a DSM program, to measure the energy or demand savings and verify if the program is generating the expected level of savings. An EM&V study can inform recommendations for improvements in program performance. The Company proposes to utilize the EM&V contractor selected for MEEIA Cycle 2 for EM&V for KEEIA Cycle 1. The Company underwent a rigorous selection process and proposes to realize the benefits of using the same EM&V contractor for all three KCP&L jurisdictions because the program portfolios for each jurisdiction are similar. KCP&L also proposes that the Commission then independently audit, either through an EM&V auditor or directly by KCC Staff (Auditor), the EM&V study results.

Approximately, but not more than, five percent (5%) of the three-year KEEIA program portfolio budget will be spent for EM&V. In Appendix G, *Variance Requests*, the Company proposes to work with the Advisory Group[1] to develop an evaluation plan to determine how best to allocate and utilize the EM&V budget. The planned Advisory Group would include KCC Staff, CURB and other potential stakeholders such as environmental groups. The evaluation plan will address three main areas: process evaluation, impact evaluation and cost-effectiveness.

EM&V reports will be completed twice during the three-year KEEIA program cycle, or every 18 months. The overall EM&V timeline and process described below and in Tables C-1 and C-2 will be used for EM&V reporting. The process includes a Draft EM&V Report, a Final Draft EM&V Report and a Final EM&V Report, with Advisory Group review.

Draft EM&V Report: One hundred twenty (120) days after the end of the first 18 months following the effective date of the programs, the EM&V contractor will circulate a draft EM&V report to KCC Staff and other Advisory Group participants.

Sixty (60) days after circulation of the Draft EM&V Report, KCC Staff and each Advisory Group participant will provide any comments and recommendations for report changes to the EM&V contractor and to KCC Staff and all other Advisory Group participants. There is a benefit to providing comments as early as possible, as providing comments and recommendations earlier to the EM&V contractor will allow more time for the incorporation of comments and changes into the Final Draft EM&V Report.

Final Draft EM&V Report: Thirty (30) days after the deadline for comments and recommendations for report changes, a Final Draft EM&V Report will be provided by the EM&V contractor to KCC Staff and all other Advisory Group participants. Prior to issuing the Final Draft EM&V Report, the EM&V contractor will host at least one meeting with KCC Staff and the other Advisory Group participants to discuss the comments and recommendations for report changes. The EM&V contractor will determine what comments and/or changes are incorporated into the Final Draft EM&V Report.

[1] The makeup and responsibilities of this Advisory Group are described in Section 1 to this Report. This Advisory Group is not the same as the advisory group referenced in Docket No. 10-GIME-013-GIE, *Order Adopting Energy Efficiency Program EM&V RFP and Procedures*, p. 26, ¶ 62, which provides for an industry-wide group to generally address the topic of EM&V.

Any Advisory Group participant that has any concerns with the Final Draft EM&V Report will provide the Company, KCC Staff and all other Advisory Group participants, and the EM&V contractor written comments within twenty (20) days from issuance of the Final Draft EM&V Report.

Final EM&V Report: Within fifteen (15) days following the expiration of the comment period on the Final Draft EM&V Report, the EM&V contractor will issue a Final EM&V Report to the Company, KCC Staff and all other Advisory Group participants. Such Final EM&V Report will be filed with the Commission.

The impact evaluation energy and demand savings (kWh and kW) findings of the Final EM&V Report will govern, as it may be modified following audit by KCC Staff or its Auditor and Commission's resolution of issues in the Order related to the impact evaluation portion of the Final EM&V Report, for purposes of calculating achievements towards targeted net energy and demand savings Earnings Opportunity (EO).

Table C-1 EM&V Timeline (Mid-Cycle Example)

# of Days	Projected Date	Description
	01/01/2017	EM&V Analysis Starts
	06/30/2018	First 18-month Program Period for KEEIA Cycle 1 Ends
120	10/28/2018	**Draft EM&V Report** Completed and Circulated
60	12/27/2018	Advisory Group Comments on Draft EM&V Report Due
30	01/26/2019	**Final Draft EM&V Report** Due
20	02/15/2019	Advisory Group Comments to **Final Draft EM&V Report** are due to the Company, KCC Staff and all other Advisory Group participants, and EM&V contractor
15	03/02/2019	**Final EM&V Report** Due
245	04/01/2019	EM&V Results are final

EM&V Use in the Earnings Opportunity Calculation

EM&V will be used for the calculation of the EO for purposes of determining the net (kWh and kW) savings attributable to the programs during the three-year KEEIA Cycle 1. For more details on the mechanics of the EO calculation refer to Section 4G.

Every 18 months the EM&V contractor will review the gross program impacts and provide recommendations regarding the adjustment of gross energy and demand savings. This review will help the Company improve the design and delivery of the demand-side programs. At the end of the KEEIA Cycle 1 three-year period, the EM&V contractor will determine the net energy and demand savings which the Company will use to calculate the EO.

Also, for purposes of calculating the EO, net kWh and kW savings attributable to the programs will exclude any shift in baseline conditions not foreseen at the time of approval of the programs. The EM&V contractor will review participant and non-participant spillover that have or are expected to take place as a result of the influence of the Company's KEEIA Cycle 1 programs during the program period and include those in the net kWh/kW savings calculations. These programs need not explicitly target market transformation.

Table C-2 Evaluation, Measurement & Verification Update Status of Inputs to Establish Earnings Opportunity

Earnings Opportunity Inputs Status			
Category	When is it updated?	Who updates?	Description
Net kWh/kW Savings	Gross evaluated savings calculated after each 18-month period of the three years of KEEIA Cycle 1. Net-to-Gross savings calculated after the three-year program KEEIA Cycle 1 (excludes baseline shifts not known at time of approval)	Initially developed by EM&V contractor subject to feedback from Advisory Group and approval from Commission	Energy and demand savings per measure. Net-to-Gross ratio = 1 – free ridership ratio + participant spillover ratio + non-participant spillover ratio Net Savings = NTG Ratio * Verified Gross Savings
Deemed Measure Life	Not updated during three-year program KEEIA Cycle 1, fixed at the values at the time of approval.	Not Applicable	Expected useful life of demand-side savings measure
Avoided Costs	Not updated during three-year program KEEIA Cycle 1, fixed at the values at the time of approval.	Not Applicable	See Section 4D
Discount Rate	Not updated during three-year program KEEIA Cycle 1, fixed at the values at the time of approval.	Not applicable	Discount rate used to calculate the real dollars
Earnings Opportunity Award	After the three-year program KEEIA Cycle 1 post EM&V	Company including data (Net kWh/kW savings) provided from EM&V contractor	See Section 4G above

Technical Resource Manual for KCP&L-KS

Published 4/5/2016

Valid for Program Implementation Dates:		**Early 2016**		**to**		**36 months following**				
Search using Drop-down Filters in Headers						Column Label:	H	I	J	K
Count: 136						Column Equation:		*see column R*	= H / L	
Measure Description							*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)	0001		per lamp	$1.70	28.2901	0.030	9.5%
Home Lighting Rebate	All	Lighting	Screw In - LEDs	0002		per lamp	$15.00	30.9532	0.033	9.5%
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle	0003		per unit	$49.00	139.0000		
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle	0004		per unit	$93.00	1,201.0000		
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle	0005		per unit	$93.00	1,190.0000		
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle	0006		per unit	$49.00	121.0000		
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs	0007	Tier 1	per lamp	$1.70	28.2901	0.030	10%
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs	0008	Tier 1	per lamp	$15.00	30.9532	0.033	10%
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator	0009	Tier 1	per unit	$2.80	65.4500		2%
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated	0010	Tier 1	per unit	$9.00	74.0357	0.008	
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead	0011	Tier 1	per unit	$15.00	272.9500		3%
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap	0012	Tier 1	per unit	$18.00	131.2958	0.015	
Whole House Efficiency	Single Family	Electronics	Smart Power Strip	0013	Tier 1	per unit	$15.00	73.7300		80%
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	0014	Tier 2	per sq ft (floor area)	$0.12	0.2300		
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	0015	Tier 2	per sq ft (ceiling area)	$0.76	0.5200		
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	0016	Tier 2	per sq ft (wall area)	$1.32	0.7200		
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	0017	Tier 2	per sq ft (window area)	$1.50	2.0500		
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	0018	Tier 3	per unit	$1,000.00	1,766.0000	0.697	12%
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan	0019	Tier 3	per unit	$353.76	608.1000		68%
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split	0020	Tier 3	per unit	$715.90	1,314.5143		
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	0021	Tier 3	per ton	$184.25	149.5400		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	0022	Tier 3	per ton	$607.09	486.0050		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)	0023	Tier 3	per ton	$422.84	149.5400		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	0024	Tier 3	per ton	$276.38	210.2906		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	0025	Tier 3	per ton	$699.22	546.7556		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)	0026	Tier 3	per ton	$422.84	210.2906		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17	0027	Tier 3	per ton	$368.51	263.8941		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement	0028	Tier 3	per ton	$791.34	600.3591		68%
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)	0029	Tier 3	per ton	$422.84	263.8941		68%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	0030	Tier 3	per ton	$152.30	173.1924		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	0031	Tier 3	per ton	$796.86	2,220.0717		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)	0032	Tier 3	per ton	$644.56	173.1924		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	0033	Tier 3	per ton	$796.86	4,719.5584		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	0034	Tier 3	per ton	$304.61	233.9430		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	0035	Tier 3	per ton	$949.17	2,282.8214		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)	0036	Tier 3	per ton	$644.56	233.9430		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	0037	Tier 3	per ton	$949.17	4,780.3091		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	0038	Tier 3	per ton	$456.91	320.5254		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement	0039	Tier 3	per ton	$1,101.47	2,369.4004		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)	0040	Tier 3	per ton	$644.56	320.5254		72%
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat	0041	Tier 3	per ton	$1,101.47	4,866.8920		72%
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs	0042	Kits	per lamp	$1.70	28.2901	0.030	10%

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Measure Description				*ies*				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)	0.0029	938	5	CFL (watts)	14
Home Lighting Rebate	All	Lighting	Screw In - LEDs	0.0031	938	20	LED (watts)	11.3
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle	0.0350		4	Unit removed	
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle	0.1910		8	Unit removed	
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle	0.1900		8	Unit removed	
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle	0.1140		4	Unit removed	
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs	0.0029	938	5	CFL (watts)	14
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs	0.0031	938	20	LED (watts)	11.3
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator	0.0101		9	Low Flow (GPM)	0.94
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated	0.0085	8,760	15	5 linear feet of insulation	
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead	0.0244		10	Low Flow (GPM)	2.5
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap	0.0150	8,760	5	Water Heater Blanket/Tank Wrap	
Whole House Efficiency	Single Family	Electronics	Smart Power Strip	0.0052		5	Smart strip	
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	0.0001		15	Efficient ACH	3.00
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	0.0003		25	Final R-value	38
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	0.0004		25	Final R-value	5
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	0.0008		25	Efficient U-factor	0.30
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	0.0837	2,533	13	Efficient EF	2.00
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan	0.3403		10	ECM Fan	
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split	0.8170		18	HP Ductless Mini Split	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	0.0890		18	SEER	15
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	0.2342		6	SEER	15
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)	0.0890		12	SEER	15
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	0.0890		18	SEER	16
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	0.2342		6	SEER	16
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)	0.0890		12	SEER	16
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17	0.1141		18	SEER	17
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement	0.2593		6	SEER	17
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)	0.1141		12	SEER	17
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	0.0542		18	SEER	15
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	0.8911		6	SEER	15
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)	0.0542		12	SEER	15
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	1.7652		6	SEER	15
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	0.0542		18	SEER	16
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	0.8911		6	SEER	16
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)	0.0542		12	SEER	16
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	1.7652		6	SEER	16
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	0.0926		18	SEER	17
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement	0.9295		6	SEER	17
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)	0.0926		12	SEER	17
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat	1.8036		12	SEER	17
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs	0.0029	938	5	CFL (watts)	14

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)	EISA tier 1 compliant Halogen (watts)	43	=(R8-P8)/1000*M8*AD8
Home Lighting Rebate	All	Lighting	Screw In - LEDs	EISA tier 1 compliant Halogen (watts)	43	=(R9-P9)/1000*M9*AD9
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle	Unit operational		deemed
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle	Unit operational		deemed
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle	Unit operational		deemed
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle	Unit operational		deemed
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs	EISA tier 1 compliant Halogen (watts)	43	=(R14-P14)/1000*M14*AD14
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs	EISA tier 1 compliant Halogen (watts)	43	=(R15-P15)/1000*M15*AD15
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator	Standard (GPM)	1.39	=(R16-P16)*AD16*(AF16*365.25)*AH16
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated	none		deemed
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead	Standard (GPM)	4	=(R18-P18)*AD18*(AF18*365.25)*AH18
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap	No Blanket		deemed
Whole House Efficiency	Single Family	Electronics	Smart Power Strip	Standard outlet strip		deemed
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	Baseline ACH	6.00	=(R21-P21)*(AB21*AD21 + AC21*AF21)
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	Previous R-value	5	=(1/R22-1/P22)*(AB22*AD22 + AC22*AF22)
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	Previous R-value	2	=(1/R23-1/P23)*(AB23*AD23 + AC23*AF23)
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	Baseline U-factor	0.90	=(R24-P24)*(AB24*AD24 + AC24*AF24)
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	Baseline EF	0.95	=((1/R25-1/P25)*AF25*AD25*365.25)
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan	Std Fan		deemed
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split	Electric heat & Room A/C		deemed
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	SEER	13	=(1/R28-1/P28)*AB28*AD28/AF28
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	SEER	10	=(1/R29-1/P29)*AB29*AD29/AF29
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)	SEER	13	=(1/R30-1/P30)*AB30*AD30/AF30
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	SEER	13	=(1/R31-1/P31)*AB31*AD31/AF31
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	SEER	10	=(1/R32-1/P32)*AB32*AD32/AF32
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)	SEER	13	=(1/R33-1/P33)*AB33*AD33/AF33
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17	SEER	13	=(1/R34-1/P34)*AB34*AD34/AF34
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement	SEER	10	=(1/R35-1/P35)*AB35*AD35/AF35
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)	SEER	13	=(1/R36-1/P36)*AB36*AD36/AF36
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	SEER	14	=((1/R37-1/P37)*AB37 + AH37*AC37)*AD37/AF37
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	SEER	9.12	=((1/R38-1/P38)*AB38 + AH38*AC38)*AD38/AF38
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)	SEER	14	=((1/R39-1/P39)*AB39 + AH39*AC39)*AD39/AF39
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	SEER	10	=((1/R40-1/P40)*AB40 + AH40*AC40)*AD40/AF40
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	SEER	14	=((1/R41-1/P41)*AB41 + AH41*AC41)*AD41/AF41
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	SEER	9.12	=((1/R42-1/P42)*AB42 + AH42*AC42)*AD42/AF42
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)	SEER	14	=((1/R43-1/P43)*AB43 + AH43*AC43)*AD43/AF43
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	SEER	10	=((1/R44-1/P44)*AB44 + AH44*AC44)*AD44/AF44
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	SEER	14	=((1/R45-1/P45)*AB45 + AH45*AC45)*AD45/AF45
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement	SEER	9.12	=((1/R46-1/P46)*AB46 + AH46*AC46)*AD46/AF46
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)	SEER	14	=((1/R47-1/P47)*AB47 + AH47*AC47)*AD47/AF47
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat	SEER	10	=((1/R48-1/P48)*AB48 + AH48*AC48)*AD48/AF48
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs	EISA tier 1 compliant Halogen (watts)	43	=(R49-P49)/1000*M49*AD49

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Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)		Distributed free to customers at food banks	100%	28.29
Home Lighting Rebate	All	Lighting	Screw In - LEDs	$4.00	per unit	100%	30.95
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle	$0.00	n/a	100%	139.00
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle	$50.00	per unit	100%	1201.00
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle	$50.00	per unit	100%	1190.00
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle	$0.00	n/a	100%	121.00
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs		Free to customer	100%	28.29
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs		Free to customer	100%	30.95
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator		Free to customer	100%	65.45
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated		Free to customer	100%	74.04
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead		Free to customer	100%	272.95
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap		Free to customer	100%	131.30
Whole House Efficiency	Single Family	Electronics	Smart Power Strip		Free to customer	100%	73.73
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	$0.08	Tiered, see Program Information	100%	0.23
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	$0.30	Tiered, see Program Information	100%	0.52
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	$0.65	Tiered, see Program Information	100%	0.72
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	$0.25	Tiered, see Program Information	100%	2.05
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	$500.00	Tiered, see Program Information	100%	1766.00
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan	$150.00	Tiered, see Program Information	100%	608.10
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split	$300.00	Tiered, see Program Information	100%	1314.51
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	$125.00	Tiered, see Program Information	100%	149.54
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	$250.00	Tiered, see Program Information	100%	486.01
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)		Tiered, see Program Information	100%	149.54
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	$200.00	Tiered, see Program Information	100%	210.29
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	$400.00	Tiered, see Program Information	100%	546.76
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)		Tiered, see Program Information	100%	210.29
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17		Tiered, see Program Information	100%	263.89
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement		Tiered, see Program Information	100%	600.36
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)		Tiered, see Program Information	100%	263.89
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	$150.00	Tiered, see Program Information	100%	173.19
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	$300.00	Tiered, see Program Information	100%	2220.07
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)		Tiered, see Program Information	100%	173.19
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	$800.00	Tiered, see Program Information	100%	4719.56
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	$300.00	Tiered, see Program Information	100%	233.94
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	$600.00	Tiered, see Program Information	100%	2282.82
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)		Tiered, see Program Information	100%	233.94
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	$1,000.00	Tiered, see Program Information	100%	4780.31
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	$500.00	Tiered, see Program Information	100%	320.53
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement		Tiered, see Program Information	100%	2369.40
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)		Tiered, see Program Information	100%	320.53
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat		Tiered, see Program Information	100%	4866.89
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs		100% covered by program	100%	28.29

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			Measure Description						*Sup*
Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Home Lighting Rebate	All	Lighting	Screw In - LEDs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle	Navigant 2013 GMO EM&V Report	7/29/2015			
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle	Navigant 2013 GMO EM&V Report	7/29/2015			
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle	Navigant 2013 GMO EM&V Report	7/29/2015			
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle	Navigant 2013 GMO EM&V Report	7/29/2015			
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Whole House Efficiency	Single Family	Electronics	Smart Power Strip	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00001
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00046
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00037
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00052
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	AEG KCP&L Program Plan 2016-2018	7/29/2015			50
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04

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			Measure Description	*porting Information* AE	AF	AG	AH
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)	Waste Heat Factor			
Home Lighting Rebate	All	Lighting	Screw In - LEDs	Waste Heat Factor			
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle				
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle				
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle				
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle				
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs	Waste Heat Factor			
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs	Waste Heat Factor			
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator	kWh per gallon hot water	3	Minutes per person per day	1.44
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated				
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead	kWh per gallon hot water	3.75	Minutes per person per day	1.44
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap				
Whole House Efficiency	Single Family	Electronics	Smart Power Strip				
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	Cooling Coefficient	0.00001	Heating Coefficient	
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	Cooling Coefficient	0.00046	Heating Coefficient	
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	Cooling Coefficient	0.00037	Heating Coefficient	
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	Cooling Coefficient	0.00052	Heating Coefficient	
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	gallons used per day	0.175	Water Heating Coefficient	
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan				
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split				
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)	Btu/hr	1,091	Coefficient	
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	Btu/hr	1,091	Coefficient	0.001796471
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	Btu/hr	1,091	Coefficient	0.027586522
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)	Btu/hr	1,091	Coefficient	0.001796471
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	Btu/hr	1,091	Coefficient	0.073296351
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	Btu/hr	1,091	Coefficient	0.001796471
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	Btu/hr	1,091	Coefficient	0.027621132
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)	Btu/hr	1,091	Coefficient	0.001796471
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	Btu/hr	1,091	Coefficient	0.073296351
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	Btu/hr	1,091	Coefficient	0.002367442
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement	Btu/hr	1,091	Coefficient	0.028192044
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)	Btu/hr	1,091	Coefficient	0.002367442
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat	Btu/hr	1,091	Coefficient	0.073867331
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs	Waste Heat Factor			

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Income-Eligible Multi-Family	All	Lighting	Screw In - CFLs (Food Bank Distribution)	
Home Lighting Rebate	All	Lighting	Screw In - LEDs	
Home Appliance Recycling Rebate	All	Appliances	Dehumidifier Recycle	
Home Appliance Recycling Rebate	All	Appliances	Freezer - Recycle	
Home Appliance Recycling Rebate	All	Appliances	Refrigerator - Recycle	
Home Appliance Recycling Rebate	All	Appliances	Room A/C Recycle	
Whole House Efficiency	Single Family	Lighting	Screw In - CFLs	
Whole House Efficiency	Single Family	Lighting	Screw In - LEDs	
Whole House Efficiency	Single Family	Hot Water	Low Flow Faucet Aerator	Persons per household
Whole House Efficiency	Single Family	Hot Water	Pipe Insulated	
Whole House Efficiency	Single Family	Hot Water	Low Flow Showerhead	Persons per household
Whole House Efficiency	Single Family	Hot Water	Water Heater Tank Wrap	
Whole House Efficiency	Single Family	Electronics	Smart Power Strip	
Whole House Efficiency	Single Family	HVAC - Shell	Air Sealing	
Whole House Efficiency	Single Family	HVAC - Shell	Increased Ceiling Insulation	
Whole House Efficiency	Single Family	HVAC - Shell	Increased Wall Insulation	
Whole House Efficiency	Single Family	HVAC - Shell	ENERGY STAR® Windows	
Whole House Efficiency	Single Family	Hot Water	Heat Pump Water Heater	
Whole House Efficiency	Single Family	HVAC	Efficient ECM Fan	
Whole House Efficiency	Single Family	HVAC	Heat Pump Ductless Mini Split	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 15 - Early Retirement (future)	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 16 - Early Retirement (future)	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement	
Whole House Efficiency	Single Family	HVAC	Air Conditioner SEER 17 - Early Retirement (future)	
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Early Retirement (future)	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 15 - Replace Electric Resistance Heat	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Early Retirement (future)	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 16 - Replace Electric Resistance Heat	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Early Retirement (future)	HSPF improvement factor
Whole House Efficiency	Single Family	HVAC	Heat Pump SEER 17 - Replace Electric Resistance Heat	HSPF improvement factor
Income-Eligible Weatherization	Single Family	Lighting	Screw In - CFLs	

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Measure Description							*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs	0043	Kits	per lamp	$15.00	30.9532	0.033	10%
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator	0044	Kits	per unit	$2.80	65.4500		2%
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated	0045	Kits	per unit	$9.00	74.0357	0.008	
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead	0046	Kits	per unit	$15.00	272.9500		3%
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap	0047	Kits	per unit	$18.00	131.2958	0.015	
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip	0048	Kits	per unit	$15.00	73.7300		80%
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation	0049	Weatherization	per sq ft (ceiling area)	$0.76	0.5200		
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation	0050	Weatherization	per home	$720.00	210.4900		
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation	0051	Weatherization	per sq ft (wall area)	$1.32	0.7200		
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	0052	Kits	per lamp	$1.70	28.2901	0.030	10%
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	0053	Kits	per lamp	$15.00	30.9532	0.033	10%
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator	0054	Kits	per unit	$2.80	42.2900		1%
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated	0055	Kits	per unit	$2.80	74.0357	0.008	
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead	0056	Kits	per unit	$15.00	235.9900		3%
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap	0057	Kits	per unit	$18.00	131.2958	0.015	
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip	0058	Kits	per unit	$15.00	73.7300		80%
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign	0059	Common Area	per unit	$30.00	78.8400	0.009	100%
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	0060	Common Area	per fixture	$100.00	701.0069	0.216	66%
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp	0061	Common Area	per lamp	$2.00	26.1245	0.008	66%
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)	0062	Common Area	per lamp	$35.00	210.8290	0.043	0%
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	0063	Common Area	per lamp	$3.33	204.6418	0.063	10%
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	0064	Common Area	per lamp	$25.08	217.7040	0.067	10%
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	0065		per unit	$350.00	462.0000		
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	0066		per unit	$350.00	462.0000		
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	0067		per sensor	$66.00	692.6340	0.213	66%
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	0068		per lamp	$30.00	78.8400	0.009	100%
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	0069		per fixture	$100.00	701.0069	0.216	66%
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	0070		per lamp	$50.00	230.7662	0.071	66%
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	0072		per lamp	$12.00	121.9142	0.038	66%
Business Standard	All	Hot Water	Heat Pump Water Heater	0074		per unit	$1,000.00	1,993.0800		12%
Business Standard	All	Hot Water	Low Flow Faucet Aerator	0075		per unit	$8.35	131.0300		1%
Business Standard	All	Hot Water	Pipe Wrap/Insulation	0076		per unit	$47.17	224.0000	0.026	
Business Standard	All	Hot Water	Pre-Rinse Spray Valves	0077		per unit	$100.00	2,670.7000		
Business Standard	All	Pools	High Efficiency Pool Pump	0078		per unit	$273.32	1,301.2478		100%
Business Standard	All	Pools	Pool Pump VSD	0079		per unit	$579.00	2,461.4482		100%
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine	0081		per unit	$140.00	1,752.0000		
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	0082		per unit	$262.85	3,025.8700		
Business Standard	All	Refrigeration	Strip Curtains	0083		per unit	$286.16	1,698.0000		100%
Business Standard	All	Refrigeration	LED Refrigerator Case Light	0084		per unit	$133.00	373.5410	0.060	90%

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Measure Description				*ies*				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs	0.0031	938	20	LED (watts)	11.3
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator	0.0101		9	Low Flow (GPM)	0.94
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated	0.0085	8,760	15	5 linear feet of insulation	
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead	0.0244		10	Low Flow (GPM)	2.5
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap	0.0150	8,760	5	Water Heater Blanket/Tank Wrap	
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip	0.0052		5	Smart strip	
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation	0.0003		25	Final R-value	38
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation	0.1178		20	CFM50	4500
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation	0.0004		25	Final R-value	5
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	0.0029	938	5	CFL (watts)	14
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	0.0031	938	20	LED (watts)	11.3
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator	0.0053		9	Low Flow (GPM)	0.94
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated	0.0085	8,760	15	5 linear feet of insulation	
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead	0.0173		10	Low Flow (GPM)	2.5
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap	0.0150	8,760	5	Water Heater Blanket/Tank Wrap	
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip	0.0052		5	Smart strip	
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign	0.0090	8,760	16	LED (watts)	2.0
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	0.1424	3,088	15	High Bay - T5 >4 lamp	295.0
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp	0.0053	3,088	10	Low Wattage T8 (watts)	22
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)	0.0000	4,903	10	LED (watts)	8.7
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	0.0060	3,088	5	CFL (watts)	25
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	0.0064	3,088	25	LED (watts)	22.0
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	1.2600		10	PCT	
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	1.2600		10	PCT	
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	0.1407	3,088	8	Photocell Occupancy Sensor	587
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	0.0090	8,760	16	LED (watts)	2.0
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	0.1424	3,088	15	High Bay T5 (>4 lamps, wattage)	295.0
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	0.0469	3,088	11	LED (watts)	22.0
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	0.0248	3,088	11	Remove T8	0
Business Standard	All	Hot Water	Heat Pump Water Heater	0.2976	2,533	10	Efficient EF	2.00
Business Standard	All	Hot Water	Low Flow Faucet Aerator	0.1957		9	Low Flow (GPM)	0.94
Business Standard	All	Hot Water	Pipe Wrap/Insulation	0.2780	8,760	6	5 linear feet of insulation	
Business Standard	All	Hot Water	Pre-Rinse Spray Valves	0.0000		5	Low Flow (GPM)	1.06
Business Standard	All	Pools	High Efficiency Pool Pump	0.1485		10	High Efficiency	
Business Standard	All	Pools	Pool Pump VSD	0.2810		10	VSD	
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine	0.1161	8,760	14	Efficient Operating Watts	200
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	0.1294		12	High Efficiency kWh/day	2.76
Business Standard	All	Refrigeration	Strip Curtains	0.1950		6	Strip Curtain	
Business Standard	All	Refrigeration	LED Refrigerator Case Light	0.0542	6,205	10	LED Display Lighting (watts)	38

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs	EISA tier 1 compliant Halogen (watts)	43	=(R50-P50)/1000*M50*AD50
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator	Standard (GPM)	1.39	=(R51-P51)*AD51*(AF51*365.25)*AH51
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated	none		deemed
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead	Standard (GPM)	4	=(R53-P53)*AD53*(AF53*365.25)*AH53
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap	No Blanket		deemed
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip	Standard outlet strip		deemed
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation	Previous R-value	5	=(1/R56-1/P56)*(AB56*AD56 + AC56*AF56)
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation	CFM50	4800	=(R57-P57)*(AB57*AD57 + AC57*AF57)
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation	Previous R-value	2	=(1/R58-1/P58)*(AB58*AD58 + AC58*AF58)
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	EISA tier 1 compliant Halogen (watts)	43	=(R59-P59)/1000*M59*AD59
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	EISA tier 1 compliant Halogen (watts)	43	=(R60-P60)/1000*M60*AD60
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator	Standard (GPM)	1.39	=(R61-P61)*AD61*(AF61*365.25)*AH61
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated	none		deemed
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead	Standard (GPM)	4	=(R63-P63)*AD63*(AF63*365.25)*AH63
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap	No Blanket		deemed
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip	Standard outlet strip		deemed
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign	Fluorescent (watts)	11.0	=(R66-P66)/1000*M66*AD66
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	Metal Halide (watts)	456.0	=(R67-P67)/1000*M67*AD67
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp	Standard T8 (watts)	28	=(R68-P68)/1000*M68*AD68
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)	Metal Halide (watts)	51.7	=(R69-P69)/1000*M69*AD69
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	EISA tier 1 compliant Halogen (watts)	72	=(R70-P70)/1000*M70*AD70
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	EISA tier 1 compliant Halogen (watts)	72	=(R71-P71)/1000*M71*AD71
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	No PCT		#N/A
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	No PCT		#N/A
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	No Control		=P74/1000*AH74*M74*AD74
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	Fluorescent (watts)	11.0	=(R75-P75)/1000*M75*AD75
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	Metal Halide (watts)	456.0	=(R76-P76)/1000*M76*AD76
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	Incandescent (watts)	75.0	=(R77-P77)/1000*M77*AD77
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	T8 4 ft (watts)	28	=(R78-P78)/1000*M78*AD78
Business Standard	All	Hot Water	Heat Pump Water Heater	Baseline EF	0.95	=((1/R79-1/P79)*AF79*AD79*365.25)
Business Standard	All	Hot Water	Low Flow Faucet Aerator	Standard (GPM)	1.39	=(R80-P80)*AD80*(AF80*365.25)
Business Standard	All	Hot Water	Pipe Wrap/Insulation	none		deemed
Business Standard	All	Hot Water	Pre-Rinse Spray Valves	Standard (GPM)	1.9	=(R82-P82)*AD82*(AF82*365.25)
Business Standard	All	Pools	High Efficiency Pool Pump	Standard Pool Pump		deemed
Business Standard	All	Pools	Pool Pump VSD	Standard Pool Pump		deemed
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine	Watts Base	400	=(R85-P85)/1000*M85
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	Standard kWh/day	3.54	=(R86-P86)*365.25*AD86
Business Standard	All	Refrigeration	Strip Curtains	none		deemed
Business Standard	All	Refrigeration	LED Refrigerator Case Light	Base Refrigeration - Standard (watts)	81	=(R88-P88)/1000*M88*(1+AD88)

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Search using Drop-down Filters in Headers

T V W X

Count: 136

Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs		100% covered by program	100%	30.95
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator		100% covered by program	100%	65.45
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated		100% covered by program	100%	74.04
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead		100% covered by program	100%	272.95
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap		100% covered by program	100%	131.30
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip		100% covered by program	100%	73.73
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation		100% covered by program	100%	0.52
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation		100% covered by program	100%	210.49
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation		100% covered by program	100%	0.72
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs		100% covered by program	100%	28.29
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs		100% covered by program	100%	30.95
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator		100% covered by program	100%	42.29
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated		100% covered by program	100%	74.04
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead		100% covered by program	100%	235.99
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap		100% covered by program	100%	131.30
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip		100% covered by program	100%	73.73
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign		100% covered by program	100%	78.84
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)		100% covered by program	100%	701.01
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp		100% covered by program	100%	26.12
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)		100% covered by program	100%	210.83
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs		100% covered by program	100%	204.64
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs		100% covered by program	100%	217.70
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat		100% covered by program, $25/yr after 1st yr	100%	462.00
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat		100% covered by program, $25/yr after 1st yr	100%	462.00
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	$69.00	per unit	100%	692.63
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	$32.00	per unit	100%	78.84
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	$105.00	per unit	100%	701.01
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	$53.00	per unit	100%	230.77
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	$13.00	per unit	100%	121.91
Business Standard	All	Hot Water	Heat Pump Water Heater	$500.00	per unit	100%	1993.08
Business Standard	All	Hot Water	Low Flow Faucet Aerator	$2.50	per unit	100%	131.03
Business Standard	All	Hot Water	Pipe Wrap/Insulation	$15.00	per unit	100%	224.00
Business Standard	All	Hot Water	Pre-Rinse Spray Valves		per unit	100%	2670.70
Business Standard	All	Pools	High Efficiency Pool Pump		per unit	100%	1301.25
Business Standard	All	Pools	Pool Pump VSD		per unit	100%	2461.45
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine	$75.00	per unit	100%	1752.00
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	$100.00	per unit	100%	3025.87
Business Standard	All	Refrigeration	Strip Curtains	$125.00	per unit	100%	1698.00
Business Standard	All	Refrigeration	LED Refrigerator Case Light	$40.00	per unit	100%	373.54

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Link to CDD Link to HDD

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Count: 136

Measure Description								*Sup*
				Z	AA	AB	AC	AD
Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00046
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00011
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	0.00037
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.04
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.00
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.00
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	Meta Analysis of PCT programs in midwest	11/4/2015			
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	Meta Analysis of PCT programs in midwest	11/4/2015			
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.00
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Hot Water	Heat Pump Water Heater	AEG KCP&L Program Plan 2016-2018	7/29/2015			55
Business Standard	All	Hot Water	Low Flow Faucet Aerator	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Business Standard	All	Hot Water	Pipe Wrap/Insulation	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Business Standard	All	Hot Water	Pre-Rinse Spray Valves	AEG KCP&L Program Plan 2016-2018	7/29/2015			0.0919
Business Standard	All	Pools	High Efficiency Pool Pump	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Business Standard	All	Pools	Pool Pump VSD	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	AEG KCP&L Program Plan 2016-2018	7/29/2015			10.62
Business Standard	All	Refrigeration	Strip Curtains	AEG KCP&L Program Plan 2016-2018	7/29/2015			60.5
Business Standard	All	Refrigeration	LED Refrigerator Case Light	AEG KCP&L Program Plan 2016-2018	7/29/2015			40%

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Search using Drop-down Filters in Headers

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				AE	AF	AG	AH
			Measure Description	*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs	Waste Heat Factor			
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator	kWh per gallon hot water	3	Minutes per person per day	1.44
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated				
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead	kWh per gallon hot water	3.75	Minutes per person per day	1.44
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap				
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip				
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation	Cooling Coefficient	0.00046	Heating Coefficient	
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation	Cooling Coefficient	0.00011	Heating Coefficient	
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation	Cooling Coefficient	0.00037	Heating Coefficient	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	Waste Heat Factor			
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	Waste Heat Factor			
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator	kWh per gallon hot water	2.24	Minutes per person per day	1.25
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated				
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead	kWh per gallon hot water	3.75	Minutes per person per day	1.25
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap				
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip				
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign	Waste Heat Factor	1.00	Waste Heat Factor	
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp	Waste Heat Factor	1.34	Waste Heat Factor	
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)	Waste Heat Factor	1.00	Waste Heat Factor	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	Waste Heat Factor	1.34	Waste Heat Factor	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	Waste Heat Factor	1.34	Waste Heat Factor	
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat				
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat				
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	Waste Heat Factor	1.34	Waste Heat Factor	27%
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	Waste Heat Factor	1.00	Waste Heat Factor	
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Hot Water	Heat Pump Water Heater	gallons used per day	0.180	Water Heating Coefficient	
Business Standard	All	Hot Water	Low Flow Faucet Aerator	kWh per gallon hot water	8.67	gallons per day	
Business Standard	All	Hot Water	Pipe Wrap/Insulation				
Business Standard	All	Hot Water	Pre-Rinse Spray Valves	kWh per gallon hot water	94.72	gallons per day	
Business Standard	All	Pools	High Efficiency Pool Pump				
Business Standard	All	Pools	Pool Pump VSD				
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine				
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	Refrigerated Volume (cu ft)			
Business Standard	All	Refrigeration	Strip Curtains	sqft			
Business Standard	All	Refrigeration	LED Refrigerator Case Light	Savings Factor			

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Income-Eligible Weatherization	Single Family	Lighting	Screw In - LEDs	
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Faucet Aerator	Persons per household
Income-Eligible Weatherization	Single Family	Hot Water	Pipe Insulated	
Income-Eligible Weatherization	Single Family	Hot Water	Low Flow Showerhead	Persons per household
Income-Eligible Weatherization	Single Family	Hot Water	Water Heater Tank Wrap	
Income-Eligible Weatherization	Single Family	Electronics	Smart Power Strip	
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Ceiling Insulation	
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Duct Insulation	
Income-Eligible Weatherization	Single Family	HVAC - Shell	Increased Wall Insulation	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Faucet Aerator	Persons per household
Income-Eligible Multi-Family	Multi-Family	Hot Water	Pipe Insulated	
Income-Eligible Multi-Family	Multi-Family	Hot Water	Low Flow Showerhead	Persons per household
Income-Eligible Multi-Family	Multi-Family	Hot Water	Water Heater Tank Wrap	
Income-Eligible Multi-Family	Multi-Family	Electronics	Smart Power Strip	
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Exit Sign	
Income-Eligible Multi-Family	Multi-Family	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	
Income-Eligible Multi-Family	Multi-Family	Lighting	Low Wattage T8 Lamp	
Income-Eligible Multi-Family	Multi-Family	Lighting	LED Flood Light (<15W)	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - CFLs	
Income-Eligible Multi-Family	Multi-Family	Lighting	Screw In - LEDs	
Residential Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	
Business Programmable Thermostat	All	HVAC	Advanced Programmable Communicating Thermostat	
Small Business Direct Install	Small C&I	Lighting	Photocell Occupancy Sensor	ESF
Small Business Direct Install	Small C&I	Lighting	LED Exit Sign	
Small Business Direct Install	Small C&I	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	
Small Business Direct Install	Small C&I	Lighting	Directional LED Bulb (≥15W)	
Small Business Direct Install	Small C&I	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	
Business Standard	All	Hot Water	Heat Pump Water Heater	
Business Standard	All	Hot Water	Low Flow Faucet Aerator	
Business Standard	All	Hot Water	Pipe Wrap/Insulation	
Business Standard	All	Hot Water	Pre-Rinse Spray Valves	
Business Standard	All	Pools	High Efficiency Pool Pump	
Business Standard	All	Pools	Pool Pump VSD	
Business Standard	All	Refrigeration	ENERGY STAR® Beverage Machine	
Business Standard	All	Refrigeration	High Efficiency Reach-In Refrigerator/Freezer	
Business Standard	All	Refrigeration	Strip Curtains	
Business Standard	All	Refrigeration	LED Refrigerator Case Light	

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						Column Label:	H	I	J	K
						Column Equation:		*see column R*	= H / L	
			Measure Description							*Gross Measure Valu*
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers	0085		per unit	$50.00	401.0000		100%
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	0086		per ton	$12.26	30.0701		91%
Business Standard	All	HVAC	Programmable Thermostat Controls	0087		per ton	$5.90	126.0527		
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	0088		per ton	$120.00	157.6937		91%
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	0089		per ton	$100.00	91.3304	0.112	91%
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	0090		per ton	$120.00	81.5600	0.082	91%
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	0091		per ton	$100.00	56.6389	0.057	81%
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	0092		per ton	$100.00	80.7362	0.081	81%
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	0093		per ton	$100.00	70.6853	0.071	81%
Business Standard	All	Lighting	Directional LED Bulb (<15W)	0096		per lamp	$40.00	143.6846	0.044	66%
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	0097		per lamp	$50.00	230.7662	0.071	66%
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	0098		per fixture	$200.00	1,084.1659	0.334	66%
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	0099		per fixture	$225.00	648.7579	0.200	66%
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	0100		per fixture	$100.00	701.0069	0.216	66%
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	0101		per fixture	$100.00	404.9294	0.125	66%
Business Standard	All	Lighting	LED Exit Sign	0102		per lamp	$30.00	78.8400	0.009	100%
Business Standard	All	Lighting	LED Flood Light (<15W)	0103		per lamp	$35.00	210.8290	0.043	0%
Business Standard	All	Lighting	LED Flood Light (≥15W)	0104		per lamp	$45.00	236.3246	0.048	0%
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	0106		per fixture	$36.17	116.6893	0.036	66%
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	0107		per fixture	$22.55	70.1007	0.022	66%
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	0108		per fixture	$55.50	149.7804	0.046	66%
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	0109		per lamp	$12.00	121.9142	0.038	66%
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	0110		per lamp	$16.00	252.5366	0.078	66%
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	0112		per lamp	$28.75	84.4692	0.026	66%
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	0113		per lamp	$38.75	130.1870	0.040	66%
Business Standard	All	Lighting	Photocell Occupancy Sensor	0114		per sensor	$66.00	692.6340	0.213	66%
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	0115		per sensor	$42.00	457.1784	0.141	66%
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)	0116		per Fan	$4,150.00	6,577.0000		
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)	0117		per Fan	$4,180.00	8,543.0000		
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)	0118		per Fan	$4,225.00	10,018.0000		
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"	0119		per unit	$57.00	1,086.6380		
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"	0120		per unit	$42.00	393.4380		
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve	0121		per unit	$700.00	1,969.6500		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays	0122		per HP	$140.37	329.0000		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays	0123		per HP	$140.37	658.0000		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays	0124		per HP	$140.37	987.0000		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends	0125		per HP	$140.37	1,385.3000		
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy	0137		per ton	$400.00	420.0000		
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy	0138		per ton	$400.00	700.0000		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation	0139		per Pump	$690.79	1,312.0900		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation	0140		per Pump	$1,324.75	6,555.3600		

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Valid for Program Implementation Dates: **Early 2016** **to**

Search using Drop-down Filters in Headers

Count: 136

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Measure Description				*ies*				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers	0.0420		15	ECM Motor	
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	0.0118		15	EER	12
Business Standard	All	HVAC	Programmable Thermostat Controls	0.0000		8	Programmable Tstat	
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	0.1941	816	15	SEER	14
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	0.1241	816	15	SEER	14
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	0.0659	1,000	15	EER	14
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	0.0458	1,000	15	EER	11.7
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	0.0653	1,000	15	EER	11.7
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	0.0571	1,000	15	EER	10.5
Business Standard	All	Lighting	Directional LED Bulb (<15W)	0.0292	3,088	11	LED (watts)	12.0
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	0.0469	3,088	11	LED (watts)	22.0
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	0.2202	3,088	15	High Bay T8 (>4 lamps, wattage)	206.0
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	0.1318	3,088	15	High Bay T8 (≤4 lamps, wattage)	146.0
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	0.1424	3,088	15	High Bay T5 (>4 lamps, wattage)	295.0
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	0.0822	3,088	15	High Bay T5 (≤4 lamps, wattage)	117.0
Business Standard	All	Lighting	LED Exit Sign	0.0090	8,760	16	LED (watts)	2.0
Business Standard	All	Lighting	LED Flood Light (<15W)	0.0000	4,903	10	LED (watts)	8.7
Business Standard	All	Lighting	LED Flood Light (≥15W)	0.0000	4,903	10	LED (watts)	16.20
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	0.0237	3,088	11	Linear style LED (watts)	32
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	0.0142	3,088	11	Linear style LED (watts)	45
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	0.0304	3,088	11	Linear style LED (watts)	54
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	0.0248	3,088	11	Remove T8	0
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	0.0513	3,088	11	Remove T8	0
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	0.0172	3,088	8	LED (watts)	10
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	0.0264	3,088	8	LED (watts)	23
Business Standard	All	Lighting	Photocell Occupancy Sensor	0.1407	3,088	8	Photocell Occupancy Sensor	587
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	0.0929	3,088	8	Wall-Mount Occupancy Sensor	350
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)	2.4000		10		
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)	3.1000		10		
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)	3.7000		10		
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"	0.5110		15		
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"	0.1630		15		
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve	0.3000		15		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays	0.1582		10		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays	0.1582		10		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays	0.1582		10		
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends	0.1582		10		
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy	0.1500		15		
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy	0.1500		15		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation	0.2280		15		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation	1.1390		15		

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers	Standard Motor		deemed
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	EER	10.2	=((1/R90-1/P90)*AB90 + AH90*AC90)*AD90/AF90
Business Standard	All	HVAC	Programmable Thermostat Controls	No Tstat		
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	SEER	13	=((1/R92-1/P92)*AB92 + AH92*AC92)*AD92/AF92
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	SEER	13	=((1/R93-1/P93)*AB93 + AH93*AC93)*AD93/AF93
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	EER	13	=(1/R94-1/P94)*AB94*AD94/AF94
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	EER	11.2	=(1/R95-1/P95)*AB95*AD95/AF95
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	EER	11	=(1/R96-1/P96)*AB96*AD96/AF96
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	EER	10	=(1/R97-1/P97)*AB97*AD97/AF97
Business Standard	All	Lighting	Directional LED Bulb (<15W)	Incandescent (watts)	45.0	=(R98-P98)/1000*M98*AD98
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	Incandescent (watts)	75.0	=(R99-P99)/1000*M99*AD99
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	Metal Halide (watts)	455.0	=(R100-P100)/1000*M100*AD100
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	Metal Halide (watts)	295.0	=(R101-P101)/1000*M101*AD101
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	Metal Halide (watts)	456.0	=(R102-P102)/1000*M102*AD102
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	Metal Halide (watts)	210.0	=(R103-P103)/1000*M103*AD103
Business Standard	All	Lighting	LED Exit Sign	Fluorescent (watts)	11.0	=(R104-P104)/1000*M104*AD104
Business Standard	All	Lighting	LED Flood Light (<15W)	Metal Halide (watts)	51.7	=(R105-P105)/1000*M105*AD105
Business Standard	All	Lighting	LED Flood Light (≥15W)	Metal Halide (watts)	64.40	=(R106-P106)/1000*M106*AD106
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	Standard T8 (watts)	59	=(R107-P107)/1000*M107*AD107
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	T8 U-tube (watts)	61	=(R108-P108)/1000*M108*AD108
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	Standard T8 (watts)	88	=(R109-P109)/1000*M109*AD109
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	T8 4 ft (watts)	28	=(R110-P110)/1000*M110*AD110
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	T8 8 ft (watts)	58	=(R111-P111)/1000*M111*AD111
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	EISA tier 1 compliant Halogen (watts)	29	=(R112-P112)/1000*M112*AD112
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	EISA tier 1 compliant Halogen (watts)	53	=(R113-P113)/1000*M113*AD113
Business Standard	All	Lighting	Photocell Occupancy Sensor	No Control		=P114/1000*AH114*M114*AD114
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	No Control		=P115/1000*AH115*M115*AD115
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)			
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)			
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)			
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"			
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"			
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve			
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays			
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays			
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays			
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends			
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy			
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy			
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation			
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation			

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Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers	$30.00	per unit	100%	401.00
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	$5.00	per unit	100%	30.07
Business Standard	All	HVAC	Programmable Thermostat Controls	$2.00	per unit	100%	126.05
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	$60.00	per unit	100%	157.69
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	$60.00	per unit	100%	91.33
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	$50.00	per unit	100%	81.56
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	$50.00	per unit	100%	56.64
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	$50.00	per unit	100%	80.74
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	$50.00	per unit	100%	70.69
Business Standard	All	Lighting	Directional LED Bulb (<15W)	$15.00	per unit	100%	143.68
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	$25.00	per unit	100%	230.77
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	$115.00	per unit	100%	1084.17
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	$75.00	per unit	100%	648.76
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	$75.00	per unit	100%	701.01
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	$45.00	per unit	100%	404.93
Business Standard	All	Lighting	LED Exit Sign	$12.00	per unit	100%	78.84
Business Standard	All	Lighting	LED Flood Light (<15W)	$15.00	per unit	100%	210.83
Business Standard	All	Lighting	LED Flood Light (≥15W)	$15.00	per unit	100%	236.32
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	$15.00	per unit	100%	116.69
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	$10.00	per unit	100%	70.10
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	$20.00	per unit	100%	149.78
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	$10.00	per unit	100%	121.91
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	$10.00	per unit	100%	252.54
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	$10.00	per unit	100%	84.47
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	$15.00	per unit	100%	130.19
Business Standard	All	Lighting	Photocell Occupancy Sensor	$35.00	per unit	100%	692.63
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	$20.00	per unit	100%	457.18
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)	$1,000		100%	6,577.00
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)	$1,000		100%	8,543.00
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)	$1,000		100%	10,018.00
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"	$20		100%	1,086.64
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"	$20		100%	393.44
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve	$200		100%	1,969.65
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays	$60		100%	329.00
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays	$60		100%	658.00
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays	$60		100%	987.00
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends	$60		100%	1,385.30
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy	$150		100%	420.00
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy	$225		100%	700.00
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation	$100		100%	1,312.09
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation	$200		100%	6,555.36

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Link to CDD Link to HDD

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Measure Description				*Sup*				
Z					AA	AB	AC	AD
Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	HVAC	Programmable Thermostat Controls	AEG KCP&L Program Plan 2016-2018	7/29/2015			
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	AEG KCP&L Program Plan 2016-2018	7/29/2015	1325	5249	12,000
Business Standard	All	Lighting	Directional LED Bulb (<15W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	LED Exit Sign	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.00
Business Standard	All	Lighting	LED Flood Light (<15W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.00
Business Standard	All	Lighting	LED Flood Light (≥15W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.00
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Photocell Occupancy Sensor	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	AEG KCP&L Program Plan 2016-2018	7/29/2015			1.41
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)	IL TRM				
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)	IL TRM				
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)	IL TRM				
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"	IL TRM				
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"	IL TRM				
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve	IL TRM				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays	IL TRM				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays	IL TRM				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays	IL TRM				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends	IL TRM				
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy	BPA				
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy	BPA				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation	Focus On Energy (WI), Grundfos				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation	Focus On Energy (WI), Grundfos				

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			Measure Description	*porting Information*			
				AE	AF	AG	AH
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers				
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	Btu/hr	11,536	Coefficient	0.001794835
Business Standard	All	HVAC	Programmable Thermostat Controls				
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	Btu/hr	2,194	Coefficient	0.00410683
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	Btu/hr	2,194	Coefficient	0.001794835
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	Btu/hr	1,071	Coefficient	
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	Btu/hr	1,071	Coefficient	
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	Btu/hr	1,071	Coefficient	
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	Btu/hr	1,071	Coefficient	
Business Standard	All	Lighting	Directional LED Bulb (<15W)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED Exit Sign	Waste Heat Factor	1.00	Waste Heat Factor	
Business Standard	All	Lighting	LED Flood Light (<15W)	Waste Heat Factor	1.00	Waste Heat Factor	
Business Standard	All	Lighting	LED Flood Light (≥15W)	Waste Heat Factor	1.00	Waste Heat Factor	
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	Photocell Occupancy Sensor	Waste Heat Factor	1.34	Waste Heat Factor	27%
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	Waste Heat Factor	1.34	Waste Heat Factor	30%
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)				
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)				
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)				
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"				
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"				
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays				
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends				
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy				
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation				

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Valid for Program Implementation Dates: **Early 2016** **to**

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Count: 136

Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Business Standard	All	Refrigeration	ECM Motors Walk-In Coolers & Freezers	
Business Standard	All	HVAC	High Efficiency PTAC/PTHP	HSPF improvement factor
Business Standard	All	HVAC	Programmable Thermostat Controls	
Business Standard	All	HVAC	Air Source Heat Pump <65 kBtuh	HSPF improvement factor
Business Standard	All	HVAC	Air Source Heat Pump 65<135 kBtuh	HSPF improvement factor
Business Standard	All	HVAC	Air Sourced Air Conditioner <65 kBtuh	
Business Standard	All	HVAC	Air Sourced Air Conditioner 65<135 kBtuh	
Business Standard	All	HVAC	Air Sourced Air Conditioner 135<240 kBtuh	
Business Standard	All	HVAC	Air Sourced Air Conditioner >240 kBtuh	
Business Standard	All	Lighting	Directional LED Bulb (<15W)	
Business Standard	All	Lighting	Directional LED Bulb (≥15W)	
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	
Business Standard	All	Lighting	High Bay Fluorescent Fixture (HP T8 ≤4 lamps)	
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 >4 lamps)	
Business Standard	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	
Business Standard	All	Lighting	LED Exit Sign	
Business Standard	All	Lighting	LED Flood Light (<15W)	
Business Standard	All	Lighting	LED Flood Light (≥15W)	
Business Standard	All	Lighting	LED Recessed Fixture (1 ft x 4 ft)	
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 2 ft)	
Business Standard	All	Lighting	LED Recessed Fixture (2 ft x 4 ft)	
Business Standard	All	Lighting	Lighting Optimization - Remove 4ft Lamp from T8 System	
Business Standard	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	
Business Standard	All	Lighting	Omnidirectional LED Bulb (<10W)	
Business Standard	All	Lighting	Omnidirectional LED Bulb (≥10W)	
Business Standard	All	Lighting	Photocell Occupancy Sensor	ESF
Business Standard	All	Lighting	Wall-Mount Occupancy Sensor	ESF
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (20ft Diameter)	
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (22ft Diameter)	
Business Standard	All	Pumps/Fans	High Volume Low Speed Fans (24ft Diameter)	
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/4"	
Business Standard	All	Pumps/Fans	Compressed Air - Engineered Nozzle 1/8"	
Business Standard	All	Pumps/Fans	Compressed Air - No Loss Condensate Drain/Valve	
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 1 shift weekdays	
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 2 shift weekdays	
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays	
Business Standard	All	Pumps/Fans	Variable Speed Drive Compressor - 3 shift weekdays plus weekends	
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, 2000-4000 annual hours occupancy	
Business Standard	All	HVAC	Advanced Rooftop Unit Controls, > 4000 annual hours occupancy	
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Domestic Hot Water Recirculation	
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Domestic Hot Water Recirculation	

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						Column Label:	H	I	J	K
						Column Equation:		*see column R*	= H / L	
Measure Description							*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation	0141		per Pump	$1,844.58	26,221.4400		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation	0142		per Pump	$690.79	359.0300		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation	0143		per Pump	$1,324.75	1,793.5800		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation	0144		per Pump	$1,844.58	7,174.3300		
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	0146	Annual Operating Hours, Measure Life and CF source: IL TRM	per fixture	$136.00	902.2800	0.10	100%
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	0147	Annual Operating Hours, Measure Life and CF source: IL TRM	per fixture	$105.00	981.1200	0.11	100%
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	0148	Annual Operating Hours, Measure Life and CF source: IL TRM	per fixture	$74.00	613.2000	0.07	100%
Business Standard	All	Lighting	Exterior LED replacing >400W HID	0149	Annual Operating Hours and CF source: IN TRM, Measure Life source: IL TRM	per fixture	$4,300.00	2,661.7000	0.62	0%
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	0150	Annual Operating Hours and CF source: IN TRM, Measure Life source: IL TRM	per fixture	$4,300.00	1,191.1000	0.28	0%
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	0151	Annual Operating Hours and CF source: IN TRM, Measure Life source: IL TRM	per fixture	$4,300.00	602.0000	0.14	0%
Business Standard	All	Lighting	Exterior LED replacing <175W HID	0152	Annual Operating Hours and CF source: IN TRM, Measure Life source: IL TRM	per fixture	$8,760.00	490.2000	0.11	0%

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Program	Segment	End Use	Measure Name	Coincident Peak Demand Savings (kW/unit)	Annual Operating Hours	Measure Life (Years)	Measure Definition	Measure Efficiency Value
Measure Description				*es*				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation	4.5560		15		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation	0.0000		15		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation	0.0000		15		
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation	0.0000		15		
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	0.1030	8,760	6	4-ft 3L to 4L 4' T5, T5HO or T8	155
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	0.1120	8,760	6	4-ft 2L to 3L 4' T5, T5HO or T8	84
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	0.0700	8,760	6	4-ft 1L to 2L 4' T5, T5HO or T8	54
Business Standard	All	Lighting	Exterior LED replacing >400W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	412
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	167
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	82
Business Standard	All	Lighting	Exterior LED replacing <175W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	37

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation			
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation			
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation			
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation			
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	200W - 250W HID Fixture	258	=(R134-P134)*(AD134)*M134/1000
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	125W - 175W HID Fixture	196	=(R135-P135)*(AD135)*M135/1000
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	≤ 100 W HID Fixture	124	=(R136-P136)*(AD136)*M136/1000
Business Standard	All	Lighting	Exterior LED replacing >400W HID	> 400 W HID Fixture	1031	=(R137-P137)*(AD137)*M137/1000
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	320 W Pulse Start and 400W MH/HPS Fixture	444	=(R138-P138)*(AD138)*M138/1000
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	175 W HID - 250 W HID Fixture	222	=(R139-P139)*(AD139)*M139/1000
Business Standard	All	Lighting	Exterior LED replacing <175W HID	< 175 W HID Fixture	151	=(R140-P140)*(AD140)*M140/1000

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Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation	$400		100%	26,221.44
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation	$100		100%	359.03
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation	$200		100%	1,793.58
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation	$400		100%	7,174.33
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	$65	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	902
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	$50	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	981
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	$35	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	613
Business Standard	All	Lighting	Exterior LED replacing >400W HID	$250	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	2,662
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	$125	Min of 50% Incremental Cost or $0.10/kWh with some rounding; Altered this one upward manually	100%	1,191
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	$75	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	602
Business Standard	All	Lighting	Exterior LED replacing <175W HID	$50	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	490

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Link to CDD Link to HDD

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Measure Description				Sup				
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Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation	Focus On Energy (WI),				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation	Focus On Energy (WI),				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation	Focus On Energy (WI),				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation	Focus On Energy (WI),				
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	IN TRM	11/4/2015			1.00
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	IN TRM				1.00
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	IN TRM				1.00
Business Standard	All	Lighting	Exterior LED replacing >400W HID	IN TRM				1.00
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	IN TRM				1.00
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	IN TRM				1.00
Business Standard	All	Lighting	Exterior LED replacing <175W HID	IN TRM				1.00

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				AE	AF	AG	AH
Measure Description				*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation				
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation				
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Exterior LED replacing >400W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Exterior LED replacing <175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Domestic Hot Water Recirculation	
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, <100 Watts Max Input, Heating Water Circulation	
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, 100 – 500 Watts Max Input, Heating Water Circulation	
Business Standard	All	Pumps/Fans	Variable Speed ECM Pump, >500 Watts Max Input, Heating Water Circulation	
Business Standard	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	
Business Standard	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	
Business Standard	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	
Business Standard	All	Lighting	Exterior LED replacing >400W HID	
Business Standard	All	Lighting	Exterior LED replacing 251-400W HID	
Business Standard	All	Lighting	Exterior LED replacing 175-250W HID	
Business Standard	All	Lighting	Exterior LED replacing <175W HID	

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						Column Label:	H	I	J	K
						Column Equation:		*see column R*	= H / L	
Measure Description							*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	0153	Annual Operating Hours source, Measure Life and CF source: IL TRM	per fixture	$520.00	902.2800	0.10	100%
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	0154	Annual Operating Hours source, Measure Life and CF source: IL TRM	per fixture	$380.00	981.1200	0.11	100%
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	0155	Annual Operating Hours source, Measure Life and CF source: IL TRM	per fixture	$320.00	613.2000	0.07	100%
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	0166	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per lamp	$24.00	54.4896	0.02	75%
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	0167	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per lamp	$22.00	34.6752	0.01	75%
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0168	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$155.00	199.7730	0.06	75%

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Measure Description				ies				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	0.1030	8,760	6	LED Parking Garage Lighting Fixtures	155
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	0.1120	8,760	6	LED Parking Garage Lighting Fixtures	84
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	0.0700	8,760	6	LED Parking Garage Lighting Fixtures	54
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	0.0124	4,128	12	4-ft LED Linear Replacement Lamps	18
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	0.0079	4,128	12	2-ft LED Linear Replacement Lamps	10
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0.0454	4,128	12	LED 1X4 Retrofit Kits	37

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	200W - 250W HID Fixture	258	=(R141-P141)*(AD141)*M141/1000
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	125W - 175W HID Fixture	196	=(R142-P142)*(AD142)*M142/1000
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	≤ 100 W HID Fixture	124	=(R143-P143)*(AD143)*M143/1000
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	32W 4-ft T8 with Electronic NBF Ballast	29	=(R144-P144)*(AD144)*M144/1000
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	17W 2-ft T8 with Electronic NBF Ballast	17	=(R145-P145)*(AD145)*M145/1000
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	1x4 T8, T12 or T5 Fluorescents	77	=(R146-P146)*(AD146)*M146/1000

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Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	$120	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	902
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	$100	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	981
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	$60	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	613
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	$5	Approximately $0.15/kWh; Keeping equitable with Troffers	100%	54
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	$4	Approximately $0.15/kWh; Keeping equitable with Troffers	100%	35
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	$35	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	200

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Link to CDD Link to HDD

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Program	Segment	End Use	Measure Name	Data Source	Date of Data Revision	Cooling Degree Days (CDD)	Heating Degree Days (HDD)	Quantity1
Measure Description				*Sup*				
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	IN TRM	11/4/2015			1.00
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	IN TRM				1.00
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	IN TRM				1.00
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	Weighted Average using IN TRM				1.20
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	Weighted Average using IN TRM				1.20
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM				1.20

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				AE	AF	AG	AH
			Measure Description	*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Business Standard	All	Lighting	Parking Garage LED replacing >175W HID	
Business Standard	All	Lighting	Parking Garage LED replacing 101W-175W HID	
Business Standard	All	Lighting	Parking Garage LED replacing ≤ 100W HID	
Business Standard	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	
Business Standard	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	
Business Standard	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	

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							Column Label: H	I	J	K
							Column Equation:	see column R	= H / L	
Measure Description							*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0169	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$145.00	257.8703	0.08	75%
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	0170	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$130.00	194.8194	0.06	75%
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0171	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$180.00	209.6802	0.06	75%
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0172	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$170.00	257.8703	0.08	75%
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0173	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$155.00	204.7266	0.06	75%

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Measure Description				*ıes*				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0.0586	4,128	12	LED 2X4 Retrofit Kits	46
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	0.0442	4,128	12	LED 2X2 Retrofit Kits	38
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0.0476	4,128	12	LED 1X4 Troffer or Linear Ambient Fixtures	35
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0.0586	4,128	12	LED 2X2 Troffer or Linear Ambient Fixtures	46
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0.0465	4,128	12	LED 2X4 Troffer or Linear Ambient Fixtures	36

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	2x4 T8, T12 or T5 Fluorescents	98	=(R147-P147)*(AD147)*M147/1000
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	2x2 T8, T12 or T5 Fluorescents	77	=(R148-P148)*(AD148)*M148/1000
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	1X4 Troffer or Linear Ambient T8, T12 or T5/T5HO	77	=(R149-P149)*(AD149)*M149/1000
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	2X4 Troffer or Linear Ambient T8, T12 or T5/T5HO	98	=(R150-P150)*(AD150)*M150/1000
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	2X2 Troffer or Linear Ambient T8, T12 or T5/T5HO	77	=(R151-P151)*(AD151)*M151/1000

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Measure Description				Program Information			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	$40	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	258
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	$35	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	195
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	$40	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	210
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	$45	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	258
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	$40	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	205

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Count: 136

Measure Description				Sup				
Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
				Z	AA	AB	AC	AD
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM				1.20
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM				1.20
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM				1.20
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM				1.20
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM				1.20

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				AE	AF	AG	AH
			Measure Description	*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Business Standard	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	
Business Standard	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	
Business Standard	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	
Business Standard	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	
Business Standard	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	

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Measure Description							*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	0174	Annual Operating Hours source, Measure Life and CF source: IL TRM	per door	$230.00	594.9354	0.15	92%
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	0175	Annual Operating Hours source, Measure Life and CF source: IL TRM	per door	$230.00	641.3488	0.16	92%
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	0176	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$35.00	195.0768	0.06	70%
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	0177	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$68.00	321.8767	0.10	70%
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	0178	Annual Operating Hours: Weighted Average IN TRM, Measure Life: IL TRM, CF source: Weighted Average IN TRM	per fixture	$120.00	512.0766	0.16	70%
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	0179		per lamp	$18.00	277.2765	0.067	70%
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	0181		per fixture	$220.00	1,478.4696	0.322	78%
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	0183		per fixture	$200.00	677.6319	0.147	78%
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	0186		per lamp	$70.00	337.5878	0.078	75%
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	0187		per lamp	$12.00	211.5000	0.054	65%
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	0188		per lamp	$20.00	360.4595	0.087	70%

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Measure Description				ies				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	0.1387	6,205	8	LED Refrigerated (Medium Temp) Case Light Fixtures (4, 5, and 6-foot)	34
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	0.1450	6,205	8	LED Freezer (Low Temp) Case Light Fixtures (4, 5, and 6-foot)	34
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	0.0423	3,933	13	LED Downlight or Retrofit Kit ≤ 13W	11
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	0.0698	3,933	13	LED Downlight or Retrofit Kit 14 to 21W	18
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	0.1110	3,933	13	LED Downlight or Retrofit Kit ≥ 22W	28
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	0.0469	3,933	7	LED (watts)	10
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	0.2508	4,369	12	High Bay T8 (>4 lamps, wattage)	240
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	0.1150	4,369	12	High Bay T5 (≤4 lamps, wattage)	110
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	0.0583	4,128	12	Remove T8	0
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	0.0348	3,750	7	LED (watts)	8
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	0.0610	3,933	7	LED (watts)	13

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						*Algorithms*
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	Linear Fluorescent T12 and T8 Fixtures	102	=(R152-P152)/1000*M152*AD152
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	Linear Fluorescent T12 and T8 Fixtures	102	=(R153-P153)/1000*M153*AD153
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	Incandescent and Halogen Downlights < 1000 lumens	51	=(R154-P154)*(AD154)*M154/1000
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	Incandescent and Halogen Downlights 1000 to 2000 lumens	84	=(R155-P155)*(AD155)*M155/1000
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	Incandescent, HID and Halogen Downlights > 2000 lumens	133	=(R156-P156)*(AD156)*M156/1000
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	Incandescent (watts)	60	=(R157-P157)*(AD157)*M157/1000
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	Metal Halide (watts)	480	=(R158-P158)*(AD158)*M158/1000
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	Metal Halide (watts)	220	=(R159-P159)*(AD159)*M159/1000
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	T8 8 ft (watts)	58	=(R160-P160)/1000*M160*AD160
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	EISA tier 1 compliant Halogen (watts)	48	=(R161-P161)/1000*M161*AD161
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	EISA tier 1 compliant Halogen (watts)	78	=(R162-P162)/1000*M162*AD162

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Program	Segment	End Use	Measure Name	Incentive Amount ($)	Incentive Definition	Net to Gross Ratio (NTG)	Net Electric Energy Savings (Annual kWh/unit)
Measure Description				*Program Information*			
				T	V	W	X
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	$50	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	595
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	$60	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	641
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	$15	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	195
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	$30	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	322
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	$50	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	512
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	$15	per unit	100%	277.28
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	$140	per unit	100%	1,478.47
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	$85	per unit	100%	677.63
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	$30	per unit	100%	337.59
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	$10	per unit	100%	211.50
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	$15	per unit	100%	360.46

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Measure Description					*Sup*				
Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	IL TRM				1.41
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	IL TRM				1.52
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	Weighted Average using IN TRM				1.24
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	Weighted Average using IN TRM				1.24
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	Weighted Average using IN TRM				1.24
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41

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				AE	AF	AG	AH
			Measure Description	*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	Waste Heat Factor_Energy	1.41	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	Waste Heat Factor_Energy	1.52	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	Waste Heat Factor_Energy	1.51	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	Waste Heat Factor_Energy	1.51	Waste Heat Factor_Demand	
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	Waste Heat Factor_Energy	1.51	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	Waste Heat Factor	1.34	Waste Heat Factor	

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Business Standard	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	
Business Standard	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	
Business Standard	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	
Business Standard	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	
Small Business Direct Install	All	Lighting	Directional LED Bulb (<15W)	
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture (HP T8 >4 lamps)	
Small Business Direct Install	All	Lighting	High Bay Fluorescent Fixture w/ HE Electronic Ballast (T5 ≤4 lamps)	
Small Business Direct Install	All	Lighting	Lighting Optimization - Remove 8ft Lamp from T8 System	
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (<10W)	
Small Business Direct Install	All	Lighting	Omnidirectional LED Bulb (≥10W)	

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Measure Description								*Gross Measure Valu*			
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**		**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	0190		per sensor		$84.00	323.0366	0.074	95%
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	0191		per fixture		$136.00	902.2800	0.103	100%
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	0192		per fixture		$105.00	981.1200	0.112	100%
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	0193		per fixture		$74.00	613.2000	0.070	100%
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	0194		per fixture		$1,182.50	2,661.7000	0.619	0%
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	0195		per fixture		$535.00	1,191.1000	0.277	0%
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	0196		per fixture		$398.80	602.0000	0.140	0%
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	0197		per fixture		$299.75	490.2000	0.114	0%
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	0198		per fixture		$520.00	902.2800	0.103	100%
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	0199		per fixture		$380.00	981.1200	0.112	100%
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	0200		per fixture		$320.00	613.2000	0.070	100%
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	0201		per fixture		$24.00	54.4896	0.017	75%
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	0202		per fixture		$22.00	34.6752	0.011	75%
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0203		per fixture		$155.00	199.7730	0.060	75%
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0204		per fixture		$145.00	257.8703	0.078	75%
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	0205		per fixture		$130.00	194.8194	0.059	75%
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0206		per fixture		$180.00	209.6802	0.063	75%
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0207		per fixture		$170.00	257.8703	0.078	75%
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0208		per fixture		$155.00	204.7266	0.062	75%

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Measure Description *ues*

Program	Segment	End Use	Measure Name	Coincident Peak Demand Savings (kW/unit)	Annual Operating Hours	Measure Life (Years)	Measure Definition	Measure Efficiency Value
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	0.0707	4,128	8	Wall-Mount Occupancy Sensor	185
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	0.1030	8,760	6	4-ft 3L to 4L 4' T5, T5HO or T8	155
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	0.1120	8,760	6	4-ft 2L to 3L 4' T5, T5HO or T8	84
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	0.0700	8,760	6	4-ft 1L to 2L 4' T5, T5HO or T8	54
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	412
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	167
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	82
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	0.0000	4,300	12	LED Exterior Lighting Fixtures (Includes Street and Area, Decorative, Soffit and Canopy, Wall-mounted, and Landscape and Flood lighting)	37
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	0.1030	8,760	6	LED Parking Garage Lighting Fixtures	155
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	0.1120	8,760	6	LED Parking Garage Lighting Fixtures	84
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	0.0700	8,760	6	LED Parking Garage Lighting Fixtures	54
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	0.0124	4,128	12	4-ft LED Linear Replacement Lamps	18
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	0.0079	4,128	12	2-ft LED Linear Replacement Lamps	10
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0.0454	4,128	12	LED 1X4 Retrofit Kits	37
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	0.0586	4,128	12	LED 2X4 Retrofit Kits	46
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	0.0442	4,128	12	LED 2X2 Retrofit Kits	38
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0.0476	4,128	12	LED 1X4 Troffer or Linear Ambient Fixtures	35
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0.0586	4,128	12	LED 2X2 Troffer or Linear Ambient Fixtures	46
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	0.0465	4,128	12	LED 2X4 Troffer or Linear Ambient Fixtures	36

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ndicates default plan values that can be adjusted for unique installations.

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Measure Description						Algorithms
Program	**Segment**	**End Use**	**Measure Name**	**Baseline Definition**	**Baseline Efficiency Value**	**Electric Energy Savings Algorithm**
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	No Control		=P163/1000*AH163*M163*AD163
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	200W - 250W HID Fixture	258	=(R164-P164)*(AD164)*M164/1000
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	125W - 175W HID Fixture	196	=(R165-P165)*(AD165)*M165/1000
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	≤ 100 W HID Fixture	124	=(R166-P166)*(AD166)*M166/1000
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	> 400 W HID Fixture	1031	=(R167-P167)*(AD167)*M167/1000
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	320 W Pulse Start and 400W MH/HPS Fixture	444	=(R168-P168)*(AD168)*M168/1000
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	175 W HID - 250 W HID Fixture	222	=(R169-P169)*(AD169)*M169/1000
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	< 175 W HID Fixture	151	=(R170-P170)*(AD170)*M170/1000
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	200W - 250W HID Fixture	258	=(R171-P171)*(AD171)*M171/1000
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	125W - 175W HID Fixture	196	=(R172-P172)*(AD172)*M172/1000
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	≤ 100 W HID Fixture	124	=(R173-P173)*(AD173)*M173/1000
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	32W 4-ft T8 with Electronic NBF Ballast	29	=(R174-P174)*(AD174)*M174/1000
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	17W 2-ft T8 with Electronic NBF Ballast	17	=(R175-P175)*(AD175)*M175/1000
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	1x4 T8, T12 or T5 Fluorescents	77	=(R176-P176)*(AD176)*M176/1000
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	2x4 T8, T12 or T5 Fluorescents	98	=(R177-P177)*(AD177)*M177/1000
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	2x2 T8, T12 or T5 Fluorescents	77	=(R178-P178)*(AD178)*M178/1000
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	1X4 Troffer or Linear Ambient T8, T12 or T5/T5HO	77	=(R179-P179)*(AD179)*M179/1000
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	2X4 Troffer or Linear Ambient T8, T12 or T5/T5HO	98	=(R180-P180)*(AD180)*M180/1000
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	2X2 Troffer or Linear Ambient T8, T12 or T5/T5HO	77	=(R181-P181)*(AD181)*M181/1000

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Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	$20	per unit	100%	323.04
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	$95	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	902.28
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	$70	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	981.12
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	$50	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	613.20
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	$400	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	2,661.70
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	$175	Min of 50% Incremental Cost or $0.10/kWh with some rounding; Altered this one upward manually	100%	1,191.10
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	$90	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	602.00
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	$75	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	490.20
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	$140	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	902.28
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	$160	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	981.12
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	$100	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	613.20
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	$7.50	Approximately $0.15/kWh; Keeping equitable with Troffers	100%	54.49
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	$5.00	Approximately $0.15/kWh; Keeping equitable with Troffers	100%	34.68
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	$35	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	199.77
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	$40	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	257.87
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	$35	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	194.82
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	$40	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	209.68
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	$45	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	257.87
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	$40	Targeted a bit above 25% of IMC between $0.16-$0.20kWh	100%	204.73

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Program	Segment	End Use	Measure Name	Data Source	Date of Data Revision	Cooling Degree Days (CDD)	Heating Degree Days (HDD)	Quantity1
Measure Description				*Sup*				
				Z	AA	AB	AC	AD
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	IN TRM	11/4/2015			1.00
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	IN TRM	11/4/2015			1.00
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	IN TRM	1/0/1900			1.00
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM	1/0/1900			1.20
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Weighted Average using IN TRM	1/0/1900			1.20

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				AE	AF	AG	AH
			Measure Description	*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	Waste Heat Factor	1.34	Waste Heat Factor	30%
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	Waste Heat Factor_Energy	1.00	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	Waste Heat Factor_Energy	1.50	Waste Heat Factor_Demand	

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Small Business Direct Install	All	Lighting	Wall-Mount Occupancy Sensor	ESF
Small Business Direct Install	All	Lighting	Parking Garage 4'3L T5, T5HP, or T8 replacing >175W HID	
Small Business Direct Install	All	Lighting	Parking Garage 4'2L T5, T5HP, or T8 replacing 101W-175W HID	
Small Business Direct Install	All	Lighting	Parking Garage 4'1L T5, T5HP, or T8 replacing ≤100W HID	
Small Business Direct Install	All	Lighting	Exterior LED replacing >400W HID	
Small Business Direct Install	All	Lighting	Exterior LED replacing 251-400W HID	
Small Business Direct Install	All	Lighting	Exterior LED replacing 175-250W HID	
Small Business Direct Install	All	Lighting	Exterior LED replacing <175W HID	
Small Business Direct Install	All	Lighting	Parking Garage LED replacing >175W HID	
Small Business Direct Install	All	Lighting	Parking Garage LED replacing 101W-175W HID	
Small Business Direct Install	All	Lighting	Parking Garage LED replacing ≤ 100W HID	
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 4' T8, T12, or T5 lamp (Eligible for lighting optimization if applicable to project)	
Small Business Direct Install	All	Lighting	LED linear replacement lamp replacing a 2-ft T8, T12 or T5 lamp	
Small Business Direct Install	All	Lighting	LED 1X4 Retrofit Kit replacing T8, T12 or T5/T5HO	
Small Business Direct Install	All	Lighting	LED 2X4 Retrofit Kit replacing T8, T12 or T5/T5HO	
Small Business Direct Install	All	Lighting	LED 2X2 Retrofit Kit replacing T8, T12 or T5/T5HO	
Small Business Direct Install	All	Lighting	LED 1X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	
Small Business Direct Install	All	Lighting	LED 2X4 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	
Small Business Direct Install	All	Lighting	LED 2X2 Troffer or Linear Ambient replacing T8, T12 or T5/T5HO	

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Measure Description							Gross Measure Valu			
						Column Label:	H	I	J	K
						Column Equation:		see column R	= H / L	
Program	**Segment**	**End Use**	**Measure Name**	**Primary Key**	**Notes**	**Unit Definition**	**Incremental Measure Cost ($/Unit)**	**Electric Energy Savings (Annual kWh/unit)**	**Nameplate Demand Savings (kW/unit)**	**Peak Coincidence Factor**
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	0209		per fixture	$230.00	594.9354	0.096	92%
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	0210		per fixture	$230.00	641.3488	0.103	92%
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	0211		per fixture	$35.00	195.0768	0.060	70%
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	0212		per fixture	$68.00	321.8767	0.100	70%
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	0213		per fixture	$120.00	512.0766	0.159	70%
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	0214		per fixture	$305.00	806.6286	0.176	83%
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	0215		per fixture	$330.00	1,096.0297	0.239	83%
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	0216		per fixture	$430.00	1,711.7767	0.373	83%
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	0217		per fixture	$725.00	4,482.6382	0.976	83%
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	0218		per lamp	$1.00	17.9222	0.004	72%
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	0219		per lamp	$2.50	35.8443	0.009	72%
Business Standard	All	Lighting	LED Low Bay 30-70W	0220		per fixture	$305.00	806.6286	0.176	83%
Business Standard	All	Lighting	LED Low/High Bay 71-110W	0221		per fixture	$330.00	1,096.0297	0.239	83%
Business Standard	All	Lighting	LED High Bay 111-175W	0222		per fixture	$430.00	1,711.7767	0.373	83%
Business Standard	All	Lighting	LED High Bay 176-350W	0223		per fixture	$725.00	4,482.6382	0.976	83%
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	0224		per lamp	$1.00	17.9222	0.004	72%
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	0225		per lamp	$2.50	35.8443	0.009	72%

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Measure Description				*es*				
Program	**Segment**	**End Use**	**Measure Name**	**Coincident Peak Demand Savings (kW/unit)**	**Annual Operating Hours**	**Measure Life (Years)**	**Measure Definition**	**Measure Efficiency Value**
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	0.0882	6,205	8	LED Refrigerated (Medium Temp) Case Light Fixtures (4, 5, and 6-foot)	34
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	0.0951	6,205	8	LED Freezer (Low Temp) Case Light Fixtures (4, 5, and 6-foot)	34
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	0.0423	3,933	13	LED Downlight or Retrofit Kit ≤ 13W	11
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	0.0698	3,933	13	LED Downlight or Retrofit Kit 14 to 21W	18
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	0.1110	3,933	13	LED Downlight or Retrofit Kit ≥ 22W	28
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	0.1457	4,367	12	LED Low Bay (watts)	70
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	0.1980	4,367	12	LED High/Low Bay (watts)	110
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	0.3092	4,367	12	LED High Bay (watts)	175
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	0.8097	4,367	12	LED High Bay (watts)	350
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	0.0031	3,911	7	28W - 4 ft fluorescent T8 lamp	25
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	0.0063	3,911	7	25W - 4 ft fluorescent T8 lamp	22
Business Standard	All	Lighting	LED Low Bay 30-70W	0.1457	4,367	12	LED Low Bay (watts)	70
Business Standard	All	Lighting	LED Low/High Bay 71-110W	0.1980	4,367	12	LED High/Low Bay (watts)	110
Business Standard	All	Lighting	LED High Bay 111-175W	0.3092	4,367	12	LED High Bay (watts)	175
Business Standard	All	Lighting	LED High Bay 176-350W	0.8097	4,367	12	LED High Bay (watts)	350
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	0.0031	3,911	7	28W - 4 ft fluorescent T8 lamp	25
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	0.0063	3,911	7	25W - 4 ft fluorescent T8 lamp	22

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ndicates default plan values that can be adjusted for unique installations.

Program	Segment	End Use	Measure Name	Baseline Definition	Baseline Efficiency Value	Electric Energy Savings Algorithm
Measure Description						*Algorithms*
				Q	R	S
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	Linear Fluorescent T12 and T8 Fixtures	102	=(R182-P182)*(AD182)*M182/1000
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	Linear Fluorescent T12 and T8 Fixtures	102	=(R183-P183)*(AD183)*M183/1000
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	Incandescent and Halogen Downlights < 1000 lumens	51	=(R184-P184)*(AD184)*M184/1000
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	Incandescent and Halogen Downlights 1000 to 2000 lumens	84	=(R185-P185)*(AD185)*M185/1000
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	Incandescent, HID and Halogen Downlights > 2000 lumens	133	=(R186-P186)*(AD186)*M186/1000
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	Pulse Start Metal Halide (watts)	201	=(R187-P187)*(AD187)*M187/1000
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	Pulse Start Metal Halide (watts)	288	=(R188-P188)*(AD188)*M188/1000
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	Pulse Start Metal Halide (watts)	453	=(R189-P189)*(AD189)*M189/1000
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	Pulse Start Metal Halide (watts)	1078	=(R190-P190)*(AD190)*M190/1000
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	32W 4 ft fluorescent T8 lamp	28	=(R191-P191)*(AD191)*M191/1000
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	32W 4 ft fluorescent T8 lamp	28	=(R192-P192)*(AD192)*M192/1000
Business Standard	All	Lighting	LED Low Bay 30-70W	Pulse Start Metal Halide (watts)	201	=(R193-P193)*(AD193)*M193/1000
Business Standard	All	Lighting	LED Low/High Bay 71-110W	Pulse Start Metal Halide (watts)	288	=(R194-P194)*(AD194)*M194/1000
Business Standard	All	Lighting	LED High Bay 111-175W	Pulse Start Metal Halide (watts)	453	=(R195-P195)*(AD195)*M195/1000
Business Standard	All	Lighting	LED High Bay 176-350W	Pulse Start Metal Halide (watts)	1078	=(R196-P196)*(AD196)*M196/1000
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	32W 4 ft fluorescent T8 lamp	28	=(R197-P197)*(AD197)*M197/1000
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	32W 4 ft fluorescent T8 lamp	28	=(R198-P198)*(AD198)*M198/1000

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Measure Description				*Program Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Incentive Amount ($)**	**Incentive Definition**	**Net to Gross Ratio (NTG)**	**Net Electric Energy Savings (Annual kWh/unit)**
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	$50	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	594.94
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	$80	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	641.35
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	$24	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	195.08
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	$45	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	321.88
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	$70	Min of 50% Incremental Cost or $0.10/kWh with some rounding	100%	512.08
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	$155	per unit	100%	806.63
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	$175	per unit	100%	1,096.03
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	$275	per unit	100%	1,711.78
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	$500	per unit	100%	4,482.64
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	$0.75	per unit	100%	17.92
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	$2.00	per unit	100%	35.84
Business Standard	All	Lighting	LED Low Bay 30-70W	$152.50	per unit	100%	806.63
Business Standard	All	Lighting	LED Low/High Bay 71-110W	$165	per unit	100%	1,096.03
Business Standard	All	Lighting	LED High Bay 111-175W	$215	per unit	100%	1,711.78
Business Standard	All	Lighting	LED High Bay 176-350W	$360.00	per unit	100%	4,482.64
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	$0.50	per unit	100%	17.92
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	$1.25	per unit	100%	35.84

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Measure Description				Sup				
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Program	**Segment**	**End Use**	**Measure Name**	**Data Source**	**Date of Data Revision**	**Cooling Degree Days (CDD)**	**Heating Degree Days (HDD)**	**Quantity1**
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	IL TRM	1/0/1900			1.41
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	IL TRM	1/0/1900			1.52
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	Weighted Average using IN TRM	1/0/1900			1.24
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	Weighted Average using IN TRM	1/0/1900			1.24
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	Weighted Average using IN TRM	1/0/1900			1.24
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Business Standard	All	Lighting	LED Low Bay 30-70W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Business Standard	All	Lighting	LED Low/High Bay 71-110W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Business Standard	All	Lighting	LED High Bay 111-175W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Business Standard	All	Lighting	LED High Bay 176-350W	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	AEG KCP&L Program Plan 2016-2018	2/11/2016			1.41

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			Measure Description	*porting Information*			
Program	**Segment**	**End Use**	**Measure Name**	**Quantity1 Description**	**Quantity2**	**Quantity2 Description**	**Quantity3**
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	Waste Heat Factor_Energy	1.41	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	Waste Heat Factor_Energy	1.52	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	Waste Heat Factor_Energy	1.51	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	Waste Heat Factor_Energy	1.51	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	Waste Heat Factor_Energy	1.51	Waste Heat Factor_Demand	
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	Waste Heat Factor	1.34	Waste Heat Factor	
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED Low Bay 30-70W	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED Low/High Bay 71-110W	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED High Bay 111-175W	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	LED High Bay 176-350W	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	Waste Heat Factor	1.34	Waste Heat Factor	
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	Waste Heat Factor	1.34	Waste Heat Factor	

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Measure Description				
Program	**Segment**	**End Use**	**Measure Name**	**Quantity3 Description**
Small Business Direct Install	All	Lighting	LED Refrigerated Case Lights (4, 5, and 6-foot)	
Small Business Direct Install	All	Lighting	LED Freezer Case Lights (4, 5, and 6-foot)	
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≤ 13W	
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit 14 to 21W	
Small Business Direct Install	All	Lighting	LED Downlight or Retrofit Kit ≥ 22W	
Small Business Direct Install	All	Lighting	LED Low Bay 30-70W	
Small Business Direct Install	All	Lighting	LED Low/High Bay 71-110W	
Small Business Direct Install	All	Lighting	LED High Bay 111-175W	
Small Business Direct Install	All	Lighting	LED High Bay 176-350W	
Small Business Direct Install	All	Lighting	28W - 4 ft fluorescent T8 lamp	
Small Business Direct Install	All	Lighting	25W - 4 ft fluorescent T8 lamp	
Business Standard	All	Lighting	LED Low Bay 30-70W	
Business Standard	All	Lighting	LED Low/High Bay 71-110W	
Business Standard	All	Lighting	LED High Bay 111-175W	
Business Standard	All	Lighting	LED High Bay 176-350W	
Business Standard	All	Lighting	28W - 4 ft fluorescent T8 lamp	
Business Standard	All	Lighting	25W - 4 ft fluorescent T8 lamp	

APPENDIX | **E**

Tariffs

GENERAL RULES AND REGULATIONS APPLYING TO ELECTRIC SERVICE

12.01 BUSINESS DEMAND-SIDE MANAGEMENT

PURPOSE:

The Business Demand-Side Management (DSM) Programs (Business Programs) identified herein are designed to encourage business Customers to proactively use energy in such a way as to reduce the net consumption of electricity through (a) energy efficiency – measures that reduce the amount of energy required to achieve a given end use; and/or (b) demand response – measures that decrease peak demand or shift demand to off-peak periods of time.

These Business Programs are offered in accordance with the Kansas Energy Efficiency Investment Act (KEEIA), Kansas Statutes Annotated (K.S.A.) 66-1283.

AVAILABILITY:

Except as otherwise provided in the terms governing a particular program, these Business Programs are available to any commercial and industrial Customers in the Company's Kansas service area served under Rate Schedules SGS, SGA, MGS, MGA, LGS, or LGA.

Unless otherwise provided for in this Section 12.01 or in the schedules governing a particular program, Customers may participate in multiple Business Programs, but may receive only one Incentive per Measure.

The Company reserves the right to discontinue the entire KEEIA Cycle 1 portfolio of programs if the Company determines that implementation of such Programs is no longer reasonable due to changed factors or circumstances that have materially and negatively impacted the economic viability of such Programs, as determined by the Company. In the event the Company determines to discontinue the KEEIA Programs, the Company shall provide notice to the Commission no less than thirty days' prior to discontinuance.

TERM:

This Section 12.01 and the sections reflecting each specific Business Program shall be effective from January 1, 2017 through December 31, 2019, unless otherwise terminated by the Commission or under the provisions for discontinuance noted above.

If the Business Programs are terminated prior to the end of the Program Period, only Customer Incentives for qualifying Measures that have been preapproved or installed prior to the Program's termination will be provided to the Customer.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.01 BUSINESS DEMAND-SIDE MANAGEMENT (Continued)

DEFINITIONS:

Unless otherwise defined in the provisions governing a particular Program, terms used for the Business Programs in this Section 12 have the following meanings:

Applicant – A Customer who has submitted a Program application or has had a Program application submitted on their behalf by an agent or trade ally.

Demand Response – Measures that decrease peak demand or shift demand to off-peak periods of time.

Demand-Side Investment Mechanism (DSIM) Rider – A mechanism approved by the Commission in Docket No. 16-KCPE-446-TAR for recovery of costs, throughput disincentive and earnings opportunity associated with the Company's demand-side Programs.

Energy Efficiency – Measures that reduce the amount of energy required to achieve a given end use.

Customer Incentive (or Incentive) – Any consideration provided by the Company directly or through the Program Administrator, including buy-downs, mark-downs, rebates, bill credits, payment to third parties, direct installation, give-aways and education, which encourages the adoption of Program Measures.

Measure – An end-use, Energy Efficiency, and/or Demand Response Measure described for each Program in the Technical Resource Manual (TRM) attached as Appendix D to the Company's Application in Docket No. 16-KCPE-446-TAR.

Participant – End-use Customer and/or manufacturer, installer, or retailer providing qualifying products or services to end-use Customers.

Program Administrator – The entity selected by the Company to provide Program design, promotion, administration, implementation, and delivery of services.

Program Partner – A retailer, distributor or other service provider that the Company or the Program Administrator has approved to provide specific Program services through execution of a Company-approved service agreement.

Program Period – The period from January 1, 2017 through December 31, 2019, unless sooner terminated under the Term provision of this tariff. Programs may have slightly earlier deadlines for certain activities, as noted on the Company's website, www.kcpl.com.

Project – One or more Measures proposed by an Applicant in a single application.

Total Resource Cost (TRC) Test – A test of the cost-effectiveness of demand-side Programs that compares the avoided utility costs to the sum of all incremental costs of end-use Measures that are implemented due to the Program (including both Company and Participant contributions), plus utility costs to administer, deliver and evaluate each demand-side Program.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.01 BUSINESS DEMAND-SIDE MANAGEMENT (Continued)

BUSINESS PROGRAM DESCRIPTIONS:

Descriptions and terms for the Business Programs offered under this tariff are contained in Sections 12.02 through 12.08.

The reduction in energy consumption or shift in peak demand will be accomplished through the following Business Programs:

- Section 12.03 - Business Energy Rebates - Standard
- Section 12.04 - Business Energy Efficiency Rebates - Custom
- Section 12.05 - Strategic Energy Management
- Section 12.06 - Block Bidding
- Section 12.07 - Small Business Direct Install
- Section 12.08 - Demand Response Incentive

In addition, Customers also have access to the Online Business Energy Audit (Section 12.02).

Business Program details regarding the interaction between the Company or Program Administrators and Participants, such as Customer Incentives paid directly to Participants, available Measures, availability of each Business Program, eligibility, application and completion requirements may be adjusted through the change process as presented below. Details on each Business Program, including those listed above and other details such as process flows, application instructions, and application forms, will be provided on the Company website, www.kcpl.com.

CHANGE PROCESS:

The change process is applicable to practical changes in Programs that do not change the intent or general implementation of the Program including, but not limited to:

- Changes to the TRM;
- Changes to Program Measures;
- Changes to Program Measure Incentive Ranges; and
- Changes to Program Measure Incentive Amounts.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.01 BUSINESS DEMAND-SIDE MANAGEMENT (Continued)

CHANGE PROCESS (Continued):

Excluding changes to Program Measure Incentive amounts, the following steps will be taken in order to affect a change under this process:

1) The Company will provide the following information to the Commission Staff in order to begin the change process:
    - Description of change desired;
    - Analysis of impact of change on Program and portfolio including cost-effectiveness, goal achievement, etc.;
    - Timeline of desired change (not less than 20 business days from submittal of change request to Commission Staff); and
    - Communication plan (internal/external) for desired change.
2) Commission Staff will provide comments and recommendations on change requests within ten (10) business days of submittal. The Company will review comments and recommendations provided and incorporate them as appropriate at the Company's discretion.
3) The Company will provide a final change recommendation with the same components of Step 1 to the Commission Staff within 10 business days of receipt of comments. To the extent Commission Staff comments and/or recommendations were not included, the Company will provide an explanation.
4) The Company will implement the change by appropriate methods and communication channels including:
    - Notify and train Company's Customer Contact Center personnel, as appropriate.
    - Modify forms and promotional materials, as appropriate.
    - Update Program information on the Company's website, www.kcpl.com, as appropriate.
    - Inform trade allies, as appropriate.

For changes to Program Measure Incentive amounts where the incentive amount remains within the approved Incentive Range, the Company will:

1) Provide notification to the Commission Staff of the desired change not less than ten (10) business days before the change is to be effective;
2) Update the Company's website, www.kcpl.com, with appropriate new incentive level(s);
3) Notify appropriate internal and external personnel of the change (similar to the process in item 4 above).

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.01 BUSINESS DEMAND-SIDE MANAGEMENT (Continued)

ANNUAL ENERGY AND DEMAND SAVINGS TARGETS BY BUSINESS PROGRAM:

Note that targeted energy and demand savings may be shifted between Programs depending on market response, changes in technology, or similar factors; however, total targeted savings will not change. These targets are based on savings at Customer meters (excluding transmission and distribution line losses).

	Incremental Annual MWh Savings Targets at Customer Side of Meter			***Cumulative Annual Total by Program***
	2017	**2018**	**2019**	
Business Energy Efficiency Rebates - Standard	7,624	8,018	8,412	24,054
Business Energy Efficiency Rebates-Custom	1,170	2,807	2,339	6,317
Strategic Energy Management	1,118	1,118	1,118	3,353
Block Bidding	2,515	2,515	2,515	7,545
Small Business Direct Install	427	730	858	2,015
TOTAL	**12,854**	**15,188**	**15,242**	**43,283**

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.01 BUSINESS DEMAND-SIDE MANAGEMENT (Continued)

ANNUAL ENERGY AND DEMAND SAVINGS TARGETS BY BUSINESS PROGRAM: (Continued)

	Incremental Annual MW Demand Savings Targets at Customer Side of Meter			***Cumulative Annual Total by Program***
	2017	**2018**	**2019**	
Business Energy Efficiency Rebates - Standard	1.68	1.77	1.86	5.31
Business Energy Efficiency Rebates-Custom	0.32	0.78	0.65	1.75
Strategic Energy Management	0.29	0.29	0.29	0.87
Block Bidding	0.44	0.44	0.44	1.32
Small Business Direct Install	0.07	0.12	0.14	0.33
Demand Response Incentive	3	10	2	15
TOTAL	**5.80**	**13.40**	**5.38**	**24.58**

PROGRAM COSTS AND INCENTIVES:

Costs of and Incentives for the Business Programs reflected herein shall be identified in a charge titled "DSIM" appearing as a separate line item on Customers' bills and applied to Customers' bills as a per kilowatt-hour charge as specified in the Company's Rate Schedule 18, DSIM Rider. All Customers taking service under said rate schedule shall pay the charge regardless of whether or not a particular customer utilizes a demand-side Program available hereunder.

CHANGES IN MEASURES OR INCENTIVES:

The Company may offer the Measures contained in the Company's current DSM Business Programs approved by the Commission. Measures being offered and Incentives available to Customers will be listed on the Company's website, www.kcpl.com. The Measures and Incentives being offered are subject to change. Customers must consult www.kcpl.com for the list of currently available Measures and Incentives.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.02 ONLINE BUSINESS ENERGY AUDIT

PURPOSE:

This Business Program provides business Customers access, through www.kcpl.com, to analyze the energy efficiency of their businesses, educational materials regarding energy efficiency and conservation, and information on the Company's other demand-side management programs.

AVAILABILITY:

This Program is available during the Program Period, and is available to all commercial and industrial Customers served under the rate schedules identified in the Business Demand-Side Management section, Section 12.01.

PROGRAM PROVISIONS:

This Energy Efficiency Program is considered educational. Additional details are available at the Company website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.03 BUSINESS ENERGY EFFICIENCY REBATES – STANDARD

PURPOSE:

The Business Energy Efficiency Rebates - Standard Program is designed to encourage installation of energy efficient Measures in existing facilities. The primary objectives of this Program are to provide pre-set incentives to facility owners and operators for the installation of high efficiency equipment and controls and to provide a marketing mechanism for electrical contractors, mechanical contractors, and their distributors to promote energy efficient equipment to end users.

AVAILABILITY:

This Business Program is available during the Program Period, and is available to all Customers served under the rate schedules identified in the Business Demand-Side Management section, Section 12.01, who also meet Standard Rebate Program Provisions below.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this Program. The Program Administrator will provide the necessary services to effectively implement the Program and to strive to attain the energy and demand savings targets. Standard Measures and Incentives will be provided to qualifying Participants that provide completed Standard Rebate Applications as indicated below:

- Participant must complete a Standard Rebate Application form, or purchase from pre-qualified equipment distributors, available at www.kcpl.com;
- Participant must provide proof of equipment purchase and installation;
- Measures must be purchased and installed within the Program Period of this tariff;
- Measures which receive an Incentive under the Custom Rebate Program are not eligible for this Standard Rebate Program; and
- Standard Measures can be installed as a retrofit in an existing facility

By applying for the Standard Rebate Program, the Participant agrees that the project may be subject to random on-site inspections by the Program Administrator.

The total amount of Program (Business Energy Efficiency Rebate Standard) rebates that a Participant can receive during a Program year (2017 through 2019) is initially set and limited to a Program cap of $400,000 per Customer. The Program cap can be adjusted by the Company for each Program year during the Program Period by filing an updated tariff sheet for approval. The rebate for the Measure will be issued upon completion of the project's final application process.

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12.03 BUSINESS ENERGY EFFICIENCY REBATES – STANDARD (Continued)

ELIGIBLE MEASURES AND INCENTIVES:

Standard Incentives approved by the Commission in Docket No. 16-KCPE-446-TAR are eligible for Program benefits and Incentives and may be offered during the Program Period. These include, but are not limited to, the following equipment types:

- Lighting and Controls;
- Motors, Pumps and Variable Frequency Drives;
- HVAC (Heating, Ventilation and Air-Conditioning);
- Business Computing; and
- Food Service and Refrigeration.

Eligible Incentives and Measures can be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
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12.04 BUSINESS ENERGY EFFICIENCY REBATES – CUSTOM

PURPOSE:

The Business Energy Efficiency Rebates - Custom Program is designed to encourage more effective utilization of electric energy through Energy Efficiency improvement opportunities which are available at the time of new equipment purchases, facility modernization, and industrial process improvement. This Program provides rebates for Energy Efficiency Measures that are not specifically covered under the Business Energy Efficiency Rebates – Standard Program. A “Custom Incentive” is a direct payment or bill credit to a Participant for installation of Measures that are part of projects that have been pre-approved by the Program Administrator.

AVAILABILITY:

This Business Program is available during the Program Period, and is available to all commercial and industrial Customers served under the rate schedules identified in the Business Demand-Side Management section, Section 12.01, that also meet the Custom Rebate Program provisions below.

PROGRAM PROVISIONS:

This Business Program provides a rebate for installing qualifying high efficiency equipment or systems, or replacing or retrofitting HVAC systems, motors, lighting, pumps or other qualifying equipment or systems with higher Energy Efficiency equipment or systems. Both new construction projects and retrofit projects are eligible to apply. To become a Participant in the Program, Customers must request a rebate for a project by submitting an application through the Company website (www.kcpl.com) or on paper. Projects must be pre-approved by the Program Administrator before the project start date to be eligible for a rebate. Customer applications will be evaluated and the rebates will be distributed on a first-come basis according to the date of the Customer’s application.

Rebate applications for different energy saving Measures at the same facility may be submitted. An entity with multiple facilities may participate for each facility by submitting an application for each facility. The maximum amount of each rebate will be calculated as a flat rate in cents per kWh saved, up to the Customer annual maximum. The cents per kWh saved rate range can be found at www.kcpl.com. The maximum total amount of Program (Business Energy Efficiency Rebate – Custom) rebates that a Participant can receive during a Program year is initially set and limited to a Program cap of $100,000 per Customer. The Program cap can be adjusted by the Company for each Program year during the Program Period by filing an updated tariff sheet for approval. The rebate for the Measure will be issued upon completion of the project’s final application process.

After the Company reviews projects approved and/or paid during the first six months of a Program year, the Company may approve applications for additional rebates if the Customer has reached its maximum and if Program funds are available.

By applying for the Custom Rebate Program, the Customer agrees that the project may be subject to random on-site inspections by the Program Administrator.

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12.05 STRATEGIC ENERGY MANAGEMENT

PURPOSE:

The Strategic Energy Management Business Program is designed to provide energy education, technical assistance and company-wide coaching to business Customers to encourage behavioral change and transformation with respect to energy use and management. The Program provides Customers consultative resources and Incentives.

AVAILABILITY:

This Business Program is available during the Program Period, and is available to all commercial and industrial Customers served under the rate schedules identified in the Business Demand-Side Management section, Section 12.01, who also meet Strategic Energy Management Program provisions below.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator and Energy Management Provider to implement this Program. The Program Administrator will provide the necessary services to effectively implement the Program and to strive to attain the energy and demand savings targets. The Energy Management Provider will serve as project manager, organizational facilitator and savings modeler.

This Business Program includes two program options:

1. One-on-One Consultative Strategy Energy Management providing the Customer with access to an energy expert who works intensively with the Customer to integrate energy management into the organization.
2. Strategic Energy Management Cohort which places companies into groups that work together for one year or longer and share best practices.

ELIGIBLE MEASURES AND INCENTIVES:

Measures approved by the Commission in Docket No. 16-KCPE-446-TAR are eligible for Program benefits and Incentives and may be offered during the Program Period. Eligible Incentives directly paid to Customers and Measures can be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
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12.06 BLOCK BIDDING

PURPOSE:

The Block Bidding Business Program is designed to encourage high-volume energy and demand savings projects from Customers, and third-party suppliers working on behalf of Customers, at a lower cost than traditional programs.

AVAILABILITY:

This Business Program is available during the Program Period, and is available to all commercial and industrial Customers served under the rate schedules identified in the Business Demand-Side Management section, Section 12.01, who also meet Block Bidding Business Program provisions below.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this Program. The Program Administrator will provide the necessary services to effectively implement the Program and strive to attain the energy and demand savings targets.

This Program seeks to purchase blocks of electric energy savings by issuing a Request for Proposal (RFP) to eligible Customers and third-party suppliers. The RFP details the proposal requirements, as well as the electric energy savings that must be achieved. Customers and/or third parties submit proposals to deliver the requested block of cost-effective electric energy and/or demand savings.

Bidder proposals are reviewed to (1) verify Customer eligibility; (2) ensure completeness and accuracy of proposed electric energy savings; and (3) screen the proposed Measures for cost-effectiveness.

Qualifying bidder proposals are ranked based upon the proposed cost per kilowatt-hour (kWh) and/or kilowatt (kW) saved ($/kWh, $/kW). Block Bidding Program funds are awarded to bidders who meet the above three point criteria and meet Company objectives including lowest $/kWh, $/kW saved until funding is depleted. The Company enters into contracts with bidders that receive Program funding. All projects must receive pre- and post-implementation inspections to verify the existing and upgraded equipment.

Further Block Bidding Business Program details can be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
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12.07 SMALL BUSINESS DIRECT INSTALL

PURPOSE:

The Small Business Direct Install Program is designed to provide targeted, cost-effective Measures to small business Customers in a quickly deployable program delivery mechanism.

AVAILABILITY:

This Business Program is available to small and medium business Customers with an average electric demand of less than or equal to 100 kW per year.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this program. The Program Administrator will provide the necessary services to effectively implement the program and to strive to attain the energy and demand savings targets.

This program offers Customers an energy assessment which includes potential energy savings and anticipated payback, as well as incentives that cover a portion of equipment and installation costs.

ELIGIBLE MEASURES AND INCENTIVES:

Measures approved by the Commission in Docket No. 16-KCPE-446-TAR are eligible for program benefits and Incentives and may be offered during the Program Period. These include, but are not limited to, the following:

- Occupancy sensors;
- LED exit signs; and
- Fluorescent lamps.

Eligible Incentives directly or indirectly paid to customers and Measures can be found at www.kcpl.com.

GENERAL RULES AND REGULATIONS
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12.08 DEMAND RESPONSE INCENTIVE

PURPOSE:

This voluntary Business Program is designed to reduce Customer load during peak periods to help defer future generation capacity additions and provide for improvements in energy supply.

AVAILABILITY:

This Business Program is available during the Program Period, and is available to all commercial and industrial Customers served under the rate schedules identified in the Business Demand-Side Management section, Section 12.01, who also meet Demand Response Incentive provisions. The Customer must have a load curtailment capability of at least 25 kW during the Curtailment Season and within designated Curtailment Hours, and must agree to establish Firm Power Levels as set forth herein. Availability is further subject to the economic and technical feasibility of the installation of required Company equipment. The Company reserves the right to limit the total Curtailable Load determined under this Program.

A Customer may enroll directly with the Company or with a Company-approved Aggregator. A Company-approved Aggregator is an entity, appointed by a Customer to act on behalf of said Customer with respect to all aspects of the Business Program, including but not limited to: a) receipt of notices from the Company under this Program; and b) receipt of Incentive payments from the Company.

AGGREGATION OF A CUSTOMER'S MULTIPLE ACCOUNTS:

For the purposes of this Program only and at the Company's option, a Customer with multiple accounts may request that some or all of its accounts be aggregated with respect to Estimated Peak Demands, Curtailable Loads and Firm Power Levels, so long as each account in the aggregation is able to provide a Curtailable Load of at least 25 kW. The aggregated account will be treated as a single account for purposes of calculating the Program Participation Payments, Curtailment Occurrence Payments and Penalties.

TERM OF CONTRACT:

Contracts under this Program shall be effective as of the date of contract execution and will expire on December 31, 2019. Thereafter, Customers may enter into a new contract subject to the terms and conditions of this Program as may be in effect at that time as modified from time to time. Written notice by either the Customer or Company to terminate a contract must be given at least thirty (30) days prior to commencement of the Curtailment Season.

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12.08 DEMAND RESPONSE INCENTIVE (Continued)

CURTAILMENT SEASON:

The Curtailment Season shall be determined based upon the method of curtailment, with Customers contracting directly with a Company participating in a Curtailment Season period of June 1 through September 30. The Curtailment Season for directly contracted Customers will exclude Independence Day and Labor Day, or the days celebrated as such. Customers contracted with and participating in a Company-approved Aggregator's portfolio shall experience a mutually agreed upon Curtailment Season pursuant to the terms of the Company-approved Aggregator's contract with the Customer, which may extend the Curtailment Season from January 1 through December 31.

The Company is not required to curtail all Participants simultaneously and may stagger Curtailment Events across participating Participants.

CURTAILMENT LIMITS:

The Customer contract shall specify the Maximum Number of Curtailment Events for which the Customer agrees to curtail load during each Curtailment Season. For Customers contracting directly with the Company, the Maximum Number of Curtailment Events shall be at least one (1) but shall not exceed ten (10) separate occurrences per Curtailment Season. Each Curtailment Event shall be no more than eight (8) consecutive hours and no more than one (1) occurrence will be required per day. The Company may call a Curtailment Event no more than three (3) consecutive days per calendar week. The cumulative hours of Curtailment Hours per Customer shall not exceed eighty (80) hours in any Curtailment Season.

For Customers contracted through a Company-approved Aggregator, the Maximum Number of Curtailment Events, Duration of Curtailment Events and Frequency of Curtailment Events shall be defined within the Customer's contract and mutually agreed upon by the Company, the Customer and the Aggregator.

ESTIMATED PEAK DEMANDS:

The Estimated Peak Demand is the average of the Customer's Monthly Maximum Demand for Monday through Friday between 12:00 noon and 8:00 pm for June 1 through September 30 from the previous year.

The Company may use such other data or methodology as may be appropriate to establish the Estimated Peak Demand.

ESTIMATED PEAK DEMAND MODIFICATIONS:

The Company may review and, if necessary, adjust the Customer's Estimated Peak Demand based on evidence that the Customer's actual peak demand has changed, or will change, significantly from the Estimated Peak Demand currently being used to calculate the Customer's Curtailable Load. If a change in the Customer's Estimated Peak Demand results in a change in its Curtailable Load, the Customer shall lose and/or repay its curtailment compensation proportional to the number of days curtailment was not available and the change in the Curtailable Load.

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12.08 DEMAND RESPONSE INCENTIVE (Continued)

FIRM POWER LEVELS:

The Customer's Firm Power Level, which is the maximum demand level to be drawn during a Curtailment Event, shall be set at least 25 kW less than the Customer's Estimated Peak Demand.

The Company may use a Test Curtailment to establish the Firm Power Levels for the Customer.

FIRM POWER LEVEL MODIFICATIONS:

The Firm Power Level may be modified to reflect significant change in Customer load, subject to verification and approval by the Company. At any time the Company may adjust the Customer's Firm Power Level downward based on evidence that the Customer's actual demand has dropped, or will drop, significantly from the Estimated Peak Demand. Any adjusted Firm Power Level shall continue to provide for a Curtailable Load of at least 25 kW.

Future Customer compensation will be adjusted accordingly for any change in Firm Power Level.

Additionally, for any change in Firm Power Level that decreases Curtailable Load for the Customer shall result in re-evaluation of all curtailment compensation to the Customer including any payment or credits made in advance of the Curtailment Season. The Customer shall repay the Company prior payments/credits made in excess of the curtailment compensation due based on the decreased level of Curtailable Load.

CURTAILABLE LOAD:

Curtailable Load shall be that portion of a Customer’s Estimated Peak Demand that the Customer is willing and able to commit for curtailment, and that the Company agrees to accept for curtailment. The Curtailable Load shall be the same amount for each month of the contract. Under no circumstances shall the Curtailable Load be less than 25 kW. Curtailable Load is calculated as the difference between the Estimated Peak Demand as determined above, and the Firm Power Level.

CUSTOMER COMPENSATION:

Customer compensation shall be defined within each Customer contract and will be based on contract term, Maximum Number of Curtailment Events and the number of actual Curtailment Events per Curtailment Season. Timing of all payments/credits shall be specified in the curtailment contract with each Customer. Payments shall be paid to the Customer by the Company in the form of a check or bill credit as specified in the contract or by a Company-approved Aggregator as defined within the Customer’s contract. The credits shall be applied before any applicable taxes. All other billing, operational, and related provisions of other applicable rate schedules shall remain in effect.

GENERAL RULES AND REGULATIONS
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12.08 DEMAND RESPONSE INCENTIVE (Continued)

CUSTOMER COMPENSATION: (Continued)

Compensation will include:

PROGRAM PARTICIPATION PAYMENT:

For each Curtailment Season, Customer shall receive a payment/credit based upon the Incentive structure outlined within the contract term. The Program Participation Payment for a Curtailment Season is equal to the per kilowatt of Curtailable Load rate as defined in the Customer's contract.

The Program Participation Payment will be divided by the number of months in the Curtailment Season and applied as bill credits equally for each month of the Curtailment Season.

Curtailment Occurrence Payment: The Customer will also receive $0.35 per kW of Curtailable Load for each Curtailment Hour during which the Customer's metered demand is less than or equal to his Firm Power Level.

NEED FOR CURTAILMENT:

Curtailments can be requested for operational or economic reasons. Operational curtailments may occur when physical operating parameters approach becoming a constraint on the generation, transmission, or distribution systems, or to maintain the Company's capacity margin requirement. Economic curtailment may occur when the marginal cost to produce or procure energy, or the opportunity to sell the energy in the wholesale market, is greater than the Customer's retail price.

ENERGY PURCHASE OPTION:

At the Company's option and the Customer's request, during a Curtailment Event called for economic reasons, the Customer may purchase energy above its Firm Power Level from the Company at a price per kilowatt-hour determined at the beginning of a Curtailment Event. A Curtailment Event Payment will not be paid to Customers for Curtailment Events where this option is used. Customer will not have the option to purchase energy during a Curtailment Event called for operational reasons.

PENALTIES:

Failure of the Customer to effect load reduction to its Firm Power Level or lower in response to any Company request for curtailment shall result in the following reduction or refund of Program Participation Payments and Curtailment Occurrence Payments for each such failure as follows:

Reduction of Program Participation Payment: Customer will receive reduced future Program Participation Payments or a bill debit, in an amount equal to 150% of the Program Participation Payment divided by the Maximum Number of Curtailment Events, the result of which is multiplied by the percentage by which the Customer underperformed during a Curtailment Event.

Any Customer who fails to reduce load to its Firm Power Level on three or more days within any Curtailment Season may be ineligible for this Program for a period of two years from the date of the third failure.

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12.08 DEMAND RESPONSE INCENTIVE (Continued)

CURTAILMENT CANCELLATION:

The Company reserves the right to cancel a scheduled Curtailment Event prior to the start time of such Curtailment Event. However, if cancellation occurs with less than two hours of the notification period remaining prior to commencement of a Curtailment Event, the canceled Curtailment Event shall be counted as a separate occurrence with a zero-hour duration.

TEST CURTAILMENT:

The Company reserves the right to request a Test Curtailment once each year and/or within three months after a Customer’s failure to effect load reduction to its Firm Power Level or lower upon any Company request for curtailment. Test Curtailments do not count toward the Maximum Number of Curtailment Events. Customers will not be compensated for Test Curtailments.

VOLUNTARY LOAD REDUCTION:

Customers served in this Program also will be served on the Voluntary Load Reduction Rider (Schedule VLR), subject to the paragraph entitled “Special Provisions for Customers Served on Schedule MP.” A separate Contract for service on Schedule VLR is not required for customers served under this Program.

ADDITIONAL VOLUNTARY EVENTS:

At any time while the Customer's contract is in effect, the Company may request a Customer to participate, on a voluntary basis, in additional Curtailment Events. Customers who are asked and who participate in these additional voluntary curtailments will receive Curtailment Event Payments as outlined previously in this tariff, but will not receive additional Program Participation Payments. This provision applies to all Customers whose contracts are still in force, whether or not they have participated in a number of Curtailment Events equal to their chosen Maximum Number of Curtailment Events.

At its sole discretion, the Company will decide to apply the terms of Voluntary Load Reduction or Additional Voluntary Events for a given Curtailment Event.

CURTAILMENT EXCESS OF CUSTOMER LOAD:

Upon the Company’s request and approval, the Customer may generate energy in excess of its load and deliver the excess energy to the Company. When excess energy is delivered to the Company during Company requested curtailments under this Program, and with Company approval, such excess energy will be treated as negative energy consumption and will be measured to reduce the Customer’s metered energy use for the month.

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12.09 Reserved for Future Use

GENERAL RULES AND REGULATIONS
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12.10 RESIDENTIAL DEMAND-SIDE MANAGEMENT

PURPOSE:

The Residential Demand-Side Management (DSM) Programs (Residential Programs identified herein are designed to encourage residential Customers to proactively use energy in such a way as to reduce consumption of electricity or to shift consumption from times of peak demand to times of non-peak demand.

These Residential Programs are offered in accordance with the Kansas Energy Efficiency Investment Act (KEEIA), Kansas Statutes Annotated, K.S.A. 66-1283.

AVAILABILITY:

Except as otherwise provided in the terms governing a particular Program, these Residential Programs are available to residential Customers in Company's Kansas service area being served under any residential rate schedule.

Unless otherwise provided for in the tariff sheets or schedules governing a particular Program, customers may participate in multiple Residential Programs, but may receive only one Incentive per Measure.

The Company reserves the right to discontinue the entire KEEIA Cycle 1 portfolio of programs, if the Company determines that implementation of such Programs is no longer reasonable due to changed factors or circumstances that have materially and negatively impacted the economic viability of such Programs as determined by the Company. In the event the Company determines to discontinue the KEEIA Programs, the Company shall provide notice to the Commission no less than thirty (30) days' prior to discontinuance.

TERM:

This Section 12.10 and the sections reflecting each specific Residential DSM Program shall be effective from January 1, 2017 through December 31, 2019, unless otherwise terminated by the Commission or under the provisions for discontinuance noted above.

If the Programs are terminated prior to the end of the Program Period, only Customer Incentives for qualifying Measures that have been installed prior to the Programs' termination will be provided to the Customer.

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12.10 RESIDENTIAL DEMAND-SIDE MANAGEMENT (Continued)

DEFINITIONS:

Unless otherwise defined in the provisions governing a particular Program, terms for the Residential Programs in this Section 12 have the following meanings:

Applicant – A Customer who has submitted a Program application or has had a Program application submitted on their behalf.

Demand Response – Measures that decrease peak demand or shift demand to off-peak periods of time.

Demand-Side Investment Mechanism (DSIM) Rider – A mechanism approved by the Commission in Docket No. 16-KCPE-446-TAR for recovery of costs, throughput disincentive, and earnings opportunity associated with the Company's demand-side Programs..

Energy Efficiency – Measures that reduce the amount of energy required to achieve a given end use.

Customer Incentive (or Incentive) – Any consideration provided by the Company directly or through the Program Administrator or Program Partners, including buy-downs, mark-downs, rebates, bill credits, payment to third parties, direct installations, give-aways and education, which encourages the adoption of Program Measures.

Measure – An end-use, Energy Efficiency, and/or Demand Response Measure described for each Program in the TRM attached as Appendix D to the Company's Application in Docket No. 16-KCPE-446-TAR.

Participant – End-use Customer and/or manufacturer, installer, or retailer providing qualifying products or services to end-use Customers.

Program Administrator – The entity selected by the Company to provide Program design, promotion, administration, implementation, and delivery of services.

Program Partner – A retailer, distributor or other service provider that the Company or the Program Administrator has approved to provide specific Program services through execution of a KCP&L approved service agreement.

Program Period – The period from January 1, 2017 through December 31, 2019, unless sooner terminated under the Term provision of this tariff. Programs may have slightly earlier deadlines for certain activities, as noted on the Company's website – www.kcpl.com.

Total Resource Cost (TRC) Test – A test of the cost-effectiveness of demand-side programs that compares the avoided utility costs to the sum of all incremental costs of end-use measures that are implemented due to the program (including both the Company and Participant contributions), plus utility costs to administer, deliver and evaluate each demand-side program.

GENERAL RULES AND REGULATIONS
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12.10 RESIDENTIAL DEMAND-SIDE MANAGEMENT (Continued)

RESIDENTIAL PROGRAM DESCRIPTIONS:

Descriptions and terms for the Residential Programs offered under this tariff are contained in Sections 12.11 through 12.17.

The reduction in energy consumption or shift in peak demand will be accomplished through the following Programs:

- Section 12.12 - Home Energy Report
- Section 12.13 - Whole House Efficiency
- Section 12.14 - Home Lighting Rebate
- Section 12.15 - Income-Eligible Weatherization
- Section 12.16 - Income-Eligible Multi-Family
- Section 12.17 - Residential Programmable Thermostat

In addition, the Company's Customers also have access to the Online Home Energy Audit (Section 12.11).

Residential Program details regarding the interaction between the Company or Program Administrators and Participants, such as Customer Incentives paid directly to Participants, available Measures, availability of each Residential Program, eligibility, and application and completion requirements may be adjusted through the change process as presented below. Details on each Residential Program, including those listed above and other details such as process flows, application instructions, and application forms, will be provided on the Company's website, www.kcpl.com.

CHANGE PROCESS:

The change process is applicable to practical changes in Programs that do not change the intent or general implementation of the Program including, but not limited to:

- Changes to the TRM;
- Changes to Program Measures;
- Changes to Program Measure Incentive Ranges; and
- Changes to Program Measure Incentive Amounts.

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12.10 RESIDENTIAL DEMAND-SIDE MANAGEMENT (Continued)

CHANGE PROCESS: (Continued)

Excluding changes to Program Measure Incentive amounts, the following steps will be taken in order to affect a change under this process:

1) The Company will provide the following information to the Commission Staff in order to begin the change process:
   - Description of change desired;
   - Analysis of impact of change on Program and portfolio including cost-effectiveness, goal achievement, etc.;
   - Timeline of desired change (not less than 20 business days from submittal of change request to Commission Staff); and
   - Communication plan (internal/external) for desired change.
2) Commission Staff will provide comments and recommendations on change requests within ten (10) business days of submittal. The Company will review comments and recommendations provided and incorporate them as appropriate at the Company's discretion.
3) The Company will provide a final change recommendation with the same components of Step 1 to the Commission Staff within ten (10) business days of receipt of comments. To the extent Commission Staff comments and/or recommendations were not included, the Company will provide an explanation.
4) The Company will implement the change by appropriate methods and communication channels including:
   - Notify and train Company Customer Contact Center personnel, as appropriate.
   - Modify forms and promotional materials, as appropriate.
   - Update Program information on the Company's website, www.kcpl.com, a appropriate.
   - Inform trade allies, as appropriate.

For changes to Program Measure Incentive amounts where the Incentive amount remains within the approved Incentive Range, the Company will:

1) Provide a notification to the Commission Staff of the desired change ten (10) business days before the change is to take place;
2) Update the Company's website, www.kcpl.com, with appropriate new Incentive level(s); and
3) Notify appropriate internal and external personnel of the change (similar to the process in item 4 above).

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12.10 RESIDENTIAL DEMAND-SIDE MANAGEMENT (Continued)

ANNUAL ENERGY AND DEMAND SAVINGS TARGETS BY RESIDENTIAL PROGRAM:

Note that targeted energy and demand savings may be shifted between Programs depending on market response, changes in technology, or similar factors; however, total targeted savings will not change. These targets are based on savings at customer meters (excluding transmission and distribution line losses).

	Incremental Annual MWh Savings Targets at Customer Side of Meter			*Cumulative Annual Total by Program*
	2017	**2018**	**2019**	
Home Energy Report	6,506	11,410	13,526	31,442
Whole House Efficiency	1,557	2,474	3.063	7,094
Home Lighting Rebate	2,378	5,820	5,820	14,018
Income-Eligible Weatherization	28	28	28	84
Income Eligible Multi-Family	2,197	1,848	1,682	5,727
Residential Programmable Thermostat	2,464	2,464	2,464	7,392
TOTAL	**15,130**	**24,044**	**26,583**	**65,757**

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12.10 RESIDENTIAL DEMAND-SIDE MANAGEMENT (Continued)

ANNUAL ENERGY AND DEMAND SAVINGS TARGETS BY RESIDENTIAL PROGRAM: (Continued)

	Incremental Annual MW Demand Savings Targets at Customer Side of Meter			*Cumulative Annual Total by Program*
	2017	**2018**	**2019**	
Home Energy Report	1.30	2.26	2.71	6.27
Whole House Efficiency	0.42	0.69	0.86	1.97
Home Lighting Rebate	0.24	0.59	0.59	1.42
Income-Eligible Weatherization	0.01	0.01	0.01	0.03
Income Eligible Multi-Family	0.23	0.20	0.18	0.61
Residential Programmable Thermostat	6.72	6.72	6.72	20.16
TOTAL	**8.92**	**10.47**	**11.07**	**30.46**

PROGRAM COSTS AND INCENTIVES

Costs of and incentives for the Residential DSM Programs reflected herein shall be reflected in a charge titled “DSIM” appearing as a separate line item on Customers’ bills and applied to Customers’ bills as a per kilowatt-hour charge as specified in the DSIM Rider and the Company’s residential rate schedules. All Customers taking service under said rate schedules shall pay the charge regardless of whether a particular Customer utilizes a demand-side Program available hereunder.

PROGRAM DESCRIPTIONS:

The following pages contain other descriptions and terms for the Residential Programs being offered under this tariff.

CHANGES IN MEASURES OR INCENTIVES:

The Company may offer the Measures contained in the Company’s current DSM Programs filing approved by the Commission. Measures being offered and Incentives available to customers will be listed on the Company’s website, www.kcpl.com. The Measures and Incentives being offered are subject to change. Customers must consult www.kcpl.com for the list of currently available Measures.

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12.11 ONLINE HOME ENERGY AUDIT

PURPOSE:

This Residential Program provides residential Customers access, through the Company's website, www.kcpl.com, to a tool that allows the Customer to analyze the Energy Efficiency of their homes, educational materials regarding Energy Efficiency and conservation, and information on the Company's other DSM Programs.

AVAILABILITY:

This Residential Program is available during the Program Period, and is available to any Customer receiving service under any of the Company's generally available residential rate schedules for its Kansas service area.

PROGRAM PROVISIONS:

This Energy Efficiency Residential Program is considered educational. Additional details are available at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS APPLYING TO ELECTRIC SERVICE

12.12 HOME ENERGY REPORT PROGRAM

PURPOSE:

The Home Energy Report Residential Program provides residential Customers with an energy report that provides a comparison of the household energy usage information with similar type Customers or "neighbors." The intention of the energy report is to provide information that will influence Customers' behavior in such a way that Customers lower their energy usage. This is a behavioral modification program.

AVAILABILITY:

This Residential Program is directed to Customers currently receiving service under any Company Kansas residential rate schedule. The Company will select 65,000 Customers for participation during the Program Period. The Program will operate as an opt-out only program, meaning the Company will select Customers for participation in the Program and will allow opt-out if desired. A Customer choosing to opt-out of the Program should contact the Company to have their premise removed from the reporting group.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this Program. The Program Administrator will deliver a turn-key program with responsibility for all aspects of Customer selection, report generation, energy savings quantification, Customer communications and reporting.

Additional Program provisions may be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.13 WHOLE HOUSE EFFICIENCY

PURPOSE:

The Whole House Efficiency Residential Program is designed to encourage residential Customers to implement whole-house improvements to homes by promoting home energy audits, comprehensive retrofit services and high efficiency mechanical equipment.

AVAILABILITY:

This Residential Program is available during the Program Period, and is available to any Customer receiving service under any generally available residential rate schedule offered by the Company for its Kansas service area. Residential Customers that rent a residence must receive the written approval of the homeowner/landlord to participate in the program.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this Program. The Program Administrator will provide the necessary services to effectively implement the Program and to strive to attain the energy and demand savings targets.

The Program consists of three options:

Option 1: Home Energy Audit. Customer receives an in-home energy audit and direct installation of low-cost Measures. The audit will identify potential efficiency improvements.

Option 2: Weatherization Measures. Customers receive Incentives for the purchase and installation of air sealing, insulation and ENERGY STAR® windows.

Option 3: HVAC Equipment. Customers are eligible to receive Incentives for qualifying HVAC equipment installed by a participating contractor.

ELIGIBLE MEASURES AND INCENTIVES:

Measures approved by the Commission in Docket No. 16-KCPE-446-TAR are eligible for Program benefits and Incentives and may be offered during the Program Period. Eligible Incentives directly or indirectly paid to Customers and Measures can be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.14 HOME LIGHTING REBATE

PURPOSE:

This Residential Program is designed to promote energy efficient lighting. The Program incentivizes the purchase of efficient lighting by providing Customers incentives on qualifying Compact Fluorescent Lamps (CFLs) and Light Emitting Diode (LED) technology. The Program also distributes free CFLs to the income-eligible community through food banks and other not-for-profit organizations.

AVAILABILITY:

The Home Lighting Rebate is available during the Program Period and residential Customers may participate in the Program by acquiring qualifying products from participating retailers. Customers receive an instant Incentive at the point-of-purchase. Additionally, the Company may offer lighting Measures through an online store a) with proper protocols to verify the Participant is a Company Kansas Customer; and b) that utilizes best practices for number of purchases per transaction.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this Program. The Program Administrator will provide the necessary services to effectively implement the Program and strive to attain the energy and demand savings targets.

A Program Administrator may be responsible for items such as Incentive processing, rebate processing, communication with the Customer to resolve application issues and status reporting associated with the Program, as directed by the Company.

This Residential Program uses a two-pronged approach:

1. Increasing supply of qualifying products through partnerships with retailers, manufacturers and distributors; and
2. Creating demand through consumer awareness and understanding of the lighting technology and the benefits of Energy Efficiency.

Program promotions will be made available at participating retailers within the Company's Kansas service territory. Participating Program Partners will be listed on the Company's website, www.kcpl.com, with store name and location listed as well as any in-store promotions being offered.

ELIGIBLE MEASURES AND INCENTIVES:

Home Lighting Rebate Measures approved by the Commission in Docket No. 16-KCPE-446-TAR are eligible for Program benefits and Incentives and may be offered for promotion during the Program Period. Eligible lighting products and Incentives paid directly to Customers or Program Partners may be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.15 INCOME-ELIGIBLE WEATHERIZATION

PURPOSE:

This Residential Program is intended to assist residential Customers in reducing their energy usage by weatherizing the homes of qualified Customers.

AVAILABILITY:

This Residential Program is available for the Program Period to any Customer currently receiving service under any Company Kansas residential rate schedule for a minimum of one year prior to completion of an application for weatherization assistance and who also meets the additional Customer eligibility requirements defined in the agreement between the Company and the Social Service Agency.

PROGRAM PROVISIONS:

The Program will be administered by Kansas-based Social Service Agencies that are directly involved in qualifying and assisting Customers under this Program.

Program funds cannot be used for administrative costs except those incurred by the Social Service Agency that is directly related to qualifying and assisting Customers under this Program. The amount of reimbursable administrative costs per Program year shall not exceed 13% of the total Program funds that are utilized by the Social Service Agency within a Program year, as defined in the agreement between the Company and the Social Service Agency.

The total amount of grants offered to a qualifying Customer will be defined in the agreement between the Company and the Social Service Agency using established criteria for Income-Eligible Weatherization. The average expenditure per Customer in each Program year shall not exceed the Adjusted Average Expenditure Limit for weatherization determined by the U.S. Department of Energy (DOE) that is applicable for the month that the weatherization is completed.

CUSTOMER ELIGIBILITY:

The Social Service Agency will determine an Applicant’s eligibility for Income-Eligible Weatherization using the following criteria: the Customer’s household earnings meet the low income guidelines for weatherization specified by the DOE for the number of persons in the residence, the residence must have energy consumption greater than 3,000 kWh per year, the Customer has received electric service from the Company for a minimum of one year prior to completion of an application and other eligibility requirements defined in the agreement between the Company and the Social Service Agency.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.16 INCOME-ELIGIBLE MULTI-FAMILY

PURPOSE:

The objective of this Residential Program is to deliver long-term energy savings and bill reductions to income-eligible Customers in multi-family housing. This will be achieved through directly installed energy savings Measures.

AVAILABILITY:

The Income-Eligible Multi-Family Program is available for the Program Period to any Customer receiving service under any Company Kansas residential rate schedule, with income-qualified dwelling units of multi-family properties (three or more units), with income levels below 200% of federal poverty guidelines who receive electric service from the Company.

PROGRAM PROVISIONS:

The Company will hire a Program Administrator to implement this Program. The Program Administrator will provide the necessary services to effectively implement the Program, including but not limited to direct installation of low-cost Measures for income-eligible homeowners and renters in multi-family housing, as well as installation of lighting Measures in multi-family common areas at no cost to the Customer in the multi-family housing.

Additional Program provisions may be found at the Company's website, www.kcpl.com.

ELIGIBLE MEASURES AND INCENTIVES:

Income-Eligible Measures approved by the Commission in Docket No. 16-KCPE-446-TAR are eligible for Program benefits and Incentives and may be offered for promotion during the Program Period. Eligible Measures and Incentives directly paid to Customers may be found at the Company's website, www.kcpl.com.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.17 RESIDENTIAL PROGRAMMABLE THERMOSTAT

PURPOSE:

The Residential Programmable Thermostat Program is intended to help reduce system peak load and thus defer the need for additional capacity. The Program accomplishes this by cycling the Participants' air conditioning unit(s) or heat pump(s) temporarily in a Company-coordinated effort to limit overall system peak load.

AVAILABILITY:

This Residential Program is available for the Program Period to any residential Customer currently receiving service under any Company Kansas residential rate schedule. Customers must also have adequate paging and/or radio coverage or constant connection; Wi-Fi enabled internet service and have a working, central air conditioning system of suitable size and technology to be controlled by the programmable thermostat. Residential property owner's (owner occupant or landlord for a rental property) permission is required to participate.

CONTROLS AND INCENTIVES:

Participants will receive a free programmable thermostat that can be controlled via radio or Wi-Fi signals sent to the unit by the Company or its assignees. If Customers have a Wi-Fi enabled programmable thermostat designated as compatible with the Company's and/or its assignee's communication network, the Customer may elect to enroll their thermostat into the Program. During a curtailment event, the Company or its assignee will send a radio or Wi-Fi signal to the thermostat that will cycle the Participant's air conditioning unit. Participants may also receive additional monetary Incentives to participate in the Program, pursuant to the Program's parameters as shown on the Company's website, www.kcpl.com, and/or Program enrollment portal. Participants may use the programmable thermostat throughout the year to improve heating and cooling efficiency.

CYCLING METHODS:

The Company may elect to cycle Participants' air conditioning units either by raising the thermostat setting two to four degrees during the curtailment event which is typically three (3) to six (6) hours, or by directly cycling the compressor unit.

NOTIFICATION:

The Company will notify Participants of a curtailment event via a website and/or on the thermostat or via push notification to their smart phone. The notification can occur prior to or at the start of a curtailment event.

CURTAILMENT SEASON:

The Curtailment Season will extend from June 1 to September 30 each year.

GENERAL RULES AND REGULATIONS
APPLYING TO ELECTRIC SERVICE

12.17 RESIDENTIAL PROGRAMMABLE THERMOSTAT (Continued)

CURTAILMENT LIMITS:

The Company may call a curtailment event any weekday, Monday through Friday, excluding Independence Day and Labor Day, or any day officially designated as such. A curtailment event occurs whenever the thermostat is being controlled by the Company or its assignees. The Company may call a maximum of one curtailment event per day per Participant, lasting no longer than six (6) hours per Participant. The Company is not required to curtail all Participants simultaneously and may stagger curtailment events across participating Participants.

CURTAILMENT OPT OUT PROVISION:

A Participant may opt out of any air conditioning cycling curtailment event during the Curtailment Season by notifying the Company at any time prior to or during a curtailment event and requesting to be opted out. A Participant may opt out of an ongoing event via their smart phone or the thermostat itself. Notification must be communicated to the Company by using the Company's website (www.kcpl.com) or by calling the Company at the telephone number provided with the air conditioner cycling agreement.

NEED FOR CURTAILMENT:

Curtailments may be requested for operational or economic reasons. Operational curtailments may occur when any physical operating parameter(s) approaches a constraint on the generation, transmission or distribution systems or to maintain the Company's capacity margin requirement. Economic reasons may include any occasion when the marginal cost to produce or procure energy or the price to sell the energy in the wholesale market is greater than a Customer's retail price.

CONTRACT TERM:

Initial contracts will be for a period of three years, terminable thereafter on 90 days written notice. At the end of the initial term, if the thermostat was provided free of charge to the Participant, the thermostat becomes the Participant's property. The Customer will remain subject to curtailment unless they make a request with the Company or its assignees to be removed from the Program. However, so long as the agreement to participate in the Program is in force, the Company will provide maintenance and repair to the programmable thermostat as may be required due to normal use. If the Participant has the Company provided thermostat and leaves the Program prior to the end of the initial contract, the Company will have 60 days thereafter to remove the thermostat and/or other control equipment; otherwise, it becomes the Participant's property.

The Company will also have a separate Customer Program Participation Agreement outlining Customer and Company responsibilities, and additional information concerning data privacy and Program termination for Customers who participate in any studies that will analyze and evaluate Customers' behavior and usage of thermostat, and associated software.

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE TOC-1

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule TOC-1 Sheet 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed October 1, 2015

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 3 Sheets

TABLE OF CONTENTS
OF RATES FOR STATE OF KANSAS

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

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By: /s/ Darrin R. Ives Vice President
Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE TOC-1

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule TOC-1 Sheet 3

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed October 1, 2015

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 3 of 3 Sheets

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Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Reserved for Future Use

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 6

KANSAS CITY POWER & LIGHT COMPANY

(Name of Issuing Utility)

Replacing Schedule 6 Sheet 2

Rate Areas No. 2 & 4

(Territory to which schedule is applicable)

which was filed October 23, 2014

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 2 of 2 Sheets

Reserved for Future Use

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 7

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 7 Sheet 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed October 23, 2014

No supplement or separate understanding
shall modify the tariff as shown hereon.

Sheet 1 of 3 Sheets

Reserved for Future Use

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Reserved for Future Use

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Reserved for Future Use

Reserved for Future Use

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Reserved for Future Use

Reserved for Future Use

RESIDENTIAL SERVICE
Schedule R **(Continued)**

SUMMER AND WINTER SEASONS:

The Summer Season is four consecutive months, beginning and effective May 16 and ending September 15, inclusive. The Winter Season is eight consecutive months, beginning and effective September 16 and ending May 15. Customer bills for meter reading periods including one or more days in both seasons will reflect the number of days in each season.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

RESIDENTIAL OTHER USE
Schedule ROU

AVAILABILITY:

This rate schedule applies to residential customers who do not qualify under any other residential rate. Customers qualifying for this rate will generally be those with well pumps, barns, machine sheds, detached garages, home workshops, or recreational vehicles whose meter is not connected to a single or multiple occupancy dwelling unit. This rate schedule cannot be used for any commercial or industrial customer.

RATE: 2RO1A

	Summer	Winter
Customer Charge (per month)	$14.00	$14.00
Energy Charge (per kWh)		
All Energy	$0.12643	$0.09934

MINIMUM:

Minimum Monthly Bill:

(1) Customer Charge; plus

(2) Any additional charges for line extensions, if applicable; plus

SUMMER AND WINTER SEASONS:

The Summer Season is four consecutive months, beginning and effective May 16 and ending September 15, inclusive. The Winter Season is eight consecutive months, beginning and effective September 16 and ending May 15. Customer bills for meter reading periods including one or more days in both seasons will reflect the number of days in each season.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

Reserved for Future Use

Reserved for Future Use

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 13

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 13 Sheet 3

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed July 1, 2011

No supplement or separate understanding shall modify the tariff as shown hereon.

Reserved for Future Use

Issued: April 6, 2016 (Month Day Year)	
Effective: January 1, 2017 (Month Day Year)	
By: /s/ Darrin R. Ives, Vice President (Title)	

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 14

KANSAS CITY POWER & LIGHT COMPANY

(Name of Issuing Utility)

Replacing Schedule 14 Sheet 1

Rate Areas No. 2 & 4

(Territory to which schedule is applicable)

which was filed July 1, 2011

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 3 Sheets

Reserved for Future Use

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Reserved for Future Use

Reserved for Future Use

ENERGY EFFICIENCY RIDER (FROZEN)
Schedule EE

APPLICABILITY:

This Energy Efficiency (EE) Rider (Schedule EE) shall be applicable to all Kansas Retail Rate Schedules for KCPL with the exception of Lighting Schedules LS, AL, CL, ML, and TR.

PURPOSE:

This EE Rider is filed in compliance with the Commission's Order in Docket No. 07-KCPE-905-RTS and is designed to recover costs associated with Commission-approved Affordability, Energy Efficiency and Demand Response programs (EE Programs), including internal labor costs, incurred during the time period July 1, 2006 through December 31, 2007 (Program Costs). This EE Rider will be effective as of July 1, 2008 and will recover such Program Costs over the customer usage for the period July 1, 2008 through June 30, 2009. KCPL will file a new EE Rider for Commission approval on or before March 31, 2009 to recover EE Program costs incurred from January 1, 2008 through December 31, 2008 over the time period July 1, 2009 through June 30, 2010. Thereafter, KCPL will file a new EE Rider no later than March 31 of each year to recover EE Program costs incurred during the prior calendar year for recovery over the following July through June period.

BASIS:

Program Costs will be recovered using an EE factor applied to each customer's bill. The EE factor will be applied to the customer's usage on a kilowatt-hour basis ($/kWh). Retail customer charges for EE Program Costs are determined by multiplying the kilowatt-hours of electricity billed by the corresponding EE factor. The customer charges associated with this EE Rider will be identified and shown as a separate line on the customer's bill.

ENERGY EFFICIENCY RIDER AMOUNT CALCULATION:

A separate EE factor will be calculated for each customer class based upon the demand allocator and total kWh for each class. The EE factor (EEF) for each customer class will be calculated to recover the Program Costs for approved EE Programs from the specified period plus any applicable true up amount from the prior period by applying a class Demand Allocator and then dividing by the total kilowatt-hours (kWh) for that class as follows:

$$EEF_{(class)} = \frac{(EEC_n + TRUE_{n-1}) \times DA_{(class)}}{KWH_{n\ (class)}}$$

Where:

EEC_n = The actual costs associated with Commission-approved EE Programs, including internal labor costs, incurred during the applicable time period (n). These costs are recorded in Account 182441, the regulatory asset established to accumulate the Kansas jurisdictional cost of all Affordability, Energy Efficiency, and Demand Side Management programs in compliance with the Stipulation and Agreement in Docket No. 04-KCPE-1025-GIE.

ENERGY EFFICIENCY RIDER (FROZEN)
Schedule EE **(continued)**

ENERGY EFFICIENCY RIDER AMOUNT CALCULATION: (continued)

$TRUE_{n-1}$ = The annual true-up amount for an EE Rider year, to be determined prior to filing the next EE Rider and to be applied to the subsequent EE factor calculation. The true-up amount will reflect any difference between the total EE revenue collected and the actual costs (EEC_n) for the previous applicable time period (n-1). Such true-up amount may be positive or negative. The true-up amount used to calculate the EEF for the first EE Rider equals zero.

$DA_{(class)}$ = The demand allocator for the applicable non-lighting classes.

$KWH_{n\ (class)}$ = The actual kWh electric sales for the Kansas jurisdiction for the applicable time period (n) for the applicable class.

TERM:

This EE Rider shall remain in effect until such time as the Commission-approved amount is recovered. In the event that the Commission rules on Docket No. 08-GIMX-441-GIV, or similar proceeding concerning demand side management cost recovery, or a law is passed regarding treatment of such expenses, then KCPL shall have the right to file for Commission approval of a compliant recovery methodology to replace or revise this EE Rider. KCPL shall have the right to continue recovery under this EE Rider until such time as a replacement methodology is approved and implemented or all Commission-approved amounts are recovered.

NOTES TO THE TARIFF:

1. The references to Accounts within the EE tariff are as defined in the FERC uniform system of accounts.
2. The EEC factor will be expressed in dollars per kilowatt-hour ($/kWh) rounded to five decimal places.
3. All DSM costs incurred through December 31, 2016, and unrecovered under the EE Rider as of January 1, 2017, will be recovered through the Company's Kansas Demand-Side Investment Mechanism (DSIM) Rider beginning July 1, 2017 as an addition to the amounts for KEEIA Cycle 1 to be recovered thereunder.
4. EE Factors for inclusion under the DSIM Rider beginning July 1, 2017 will be determined in conjunction with the semi-annual DSIM Rider filing for that period.

RESIDENTIAL TIME OF DAY SERVICE (FROZEN)
Schedule RTOD (Continued)

MINIMUM:

Minimum Monthly Bill:
(i) $20.00 per customer; plus
(ii) Any additional charges for line extensions, if applicable.

WINTER SEASON:

Eight consecutive months, spanning the period October 1 of one year to May 31 of the next year.

SUMMER SEASON:

Four consecutive months, spanning the period June 1 to September 30 each year.

SUMMER ON-PEAK AND OFF-PEAK PERIODS:

On-peak hours are defined to be the hours between 1 p.m. and 7 p.m., Monday through Friday, excluding week-day holidays during the Summer Season. Off-Peak hours are defined to be all other hours during the Summer Season. Week-day holidays are Independence Day and Labor Day.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

APPLICABILITY:

This Demand-Side Investment Mechanism (DSIM) Rider (Schedule DSIM) shall be applicable to all Kansas Retail Rate Schedules for the Company with the exception of Lighting Schedules LS, AL, CL, ML, TR, MOL, and ML-LED.

PURPOSE:

This DSIM Rider is filed in compliance with the Kansas Energy Efficiency Investment Act (KEEIA) and the Commission's Order in Docket No. 16-KCPE-446-TAR, and is designed to recover all Program Costs, Throughput Disincentive (TD), and Earnings Opportunity (EO) associated with the Commission-approved KEEIA Cycle 1 Energy Efficiency and Demand Response programs (KEEIA Programs), which are effective during the time period January 1, 2017 through December 31, 2019*. This DSIM Rider will be effective as of January 1, 2017.

BASIS:

Program Costs, TD, and any Commission-approved EO will be recovered using a DSIM rate applied to each Customer's bill. The DSIM rate will be applied to the Customer's usage on a kilowatt-hour basis ($/kWh). Retail Customer charges under this DSIM Rider are determined by multiplying the kilowatt-hours of electricity billed by the corresponding DSIM rate. The charges associated with the DSIM Rider will be identified and shown as a separate line item on the Customer bill. Such separate line item will replace the current Energy Efficiency (EE) Rider (Schedule 15) line item on the Customer bill and the DSIM Rider rate will include all unrecovered EE Rider costs until such time as all Commission-approved costs under the EE Rider have been fully recovered.

Because the DSIM Rider includes prospective or estimated Program Costs and TD, the DSIM Rider will reflect reconciliations, with interest, to true-up for differences between the revenues billed under this DSIM Rider and total actual amounts for Program Costs, TD, and amortization of any Commission-approved Earnings Opportunity.

*Charges under this DSIM Rider shall continue after the anticipated 36-month plan period of the KEEIA Cycle 1 programs until such time as the charges described above (Program Costs, TD, and Commission-approved EO) have been billed and fully recovered.

DEFINITIONS:

As used in this DSIM Rider, the following definitions shall apply:

KEEIA Programs means the Commission-approved demand-side programs effective following the Commission order in Docket No. 16-KCPE-446-TAR.

KEEIA Cycle 1 Plan consists of this KEEIA DSIM Rider, the Commission-approved KEEIA Programs, and activities in support of KEEIA programs.

Program Plan Year 1 means the 12-month period beginning January 1, 2017 and each subsequent 12-month period through December 31, 2019 shall be known as Program Plan Year 2 and Program Plan Year 3.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

DEFINITIONS: (continued)

Effective Period (EP) means the six-month period of January-June of Program Plan Year 1 of KEEIA Cycle 1 and each six-month period thereafter.

Technical Resource Manual (TRM) means the Company Technical Resource Manual (attached as Appendix D to the Company's Application in Docket No. 16-KCPE-446-TAR) and updated based on EM&V ex post gross adjustments determined for Program Plan Year 1 no later than 24 months after the commencement of KEEIA Cycle 1.

Evaluation Measurement & Verification (EM&V) means the performance of studies and activities intended to evaluate the process of the Company's program delivery and oversight, and to estimate and/or verify the estimated actual energy and demand savings, Company lost margin revenue, cost-effectiveness, and other effects from the Company's KEEIA Programs.

Program Costs means any reasonable and prudent program expenditures, including such items as program planning and program design; administration; delivery; end-use Measures and Customer Incentive payments; marketing expense; EM&V; market potential studies; and any work on a Statewide technical resource manual.

Measure means the Energy Efficiency and/or Demand Response standard measures as described for each program in the TRM attached as Appendix D to the Company's Application in Docket No. 16-KCPE-446-TAR.

Energy Efficiency means Measures that reduce the amount of energy required to achieve a given end use.

Demand Response means Measures that decrease peak demand or shift demand to off-peak periods of time.

Customer Incentive means any consideration provided by the Company, including buy-downs, mark-downs, rebates, bill credits, payments to third parties, direct installation, give-aways, and education, which encourages the adoption of program Measures.

Residential Class shall refer to the residential rate schedules and customers served thereunder as listed in the Company's Schedule of Rates, Table of Contents, Schedule TOC-1, Sheet No. 1. Residential Class rate schedules currently available include Residential Service, Residential Other Use, Residential Time-Of-Day Service (Frozen).

Non-Residential Class shall refer to the commercial and industrial rate schedules and customers served thereunder as listed in the Company's Schedule of Rates, Table of Contents, Schedule TOC-1, Sheet No. 1. Non-Residential Class rate schedules currently available include Small General Service, Small General Service – Space Heating, Medium General Service, Medium General Service – Space Heating, Large General Service, Large General Service – Space Heating, Real-Time Pricing, and Real-Time Pricing Plus.

Throughput Disincentive (TD) means the Company's lost margins associated with the implementation of the KEEIA Programs. The detailed methodology for calculating the TD is described beginning on Sheet No. 5 of this Schedule 18.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

DEFINITIONS: (continued)

Earnings Opportunity (EO) means any Commission-approved Company performance incentive based on actual performance verified through EM&V against Commission-approved planned targets. The Company's EO will be $8.5 million if 100% of the Commission-approved planned targets are achieved. EO is capped at approximately $12.0 million, which reflects adjustment for TD verified by EM&V. Potential EO adjustments are described on Sheet No. 8 of this Schedule 18. The Earnings Opportunity Matrix outlining the payout rates, weightings, and caps can be found on Sheet No. 10 of this Schedule 18.

Short-term Borrowing Rate means (i) the daily one month U.S. Dollar London Interbank Offered Rate (LIBOR) rate, using the last actual rate for weekends and holidays or dates without an available LIBOR rate, plus (ii) the Applicable Margin for Eurodollar Advances as defined in the Pricing Schedule of the current Company Revolving Credit Agreement. A simple mathematical average of all the daily rates for the month is then computed.

DETERMINATION OF DSIM RATES:

The DSIM rate applicable during each EP is a dollar per kWh ($/kWh) rate for each rate schedule calculated as follows:

DSIM = [NPC + NTD + NEO + NOA] / PE

PE = Projected Energy, in kWh, forecasted to be delivered to the customers to which the DSIM Rider applies during the applicable EP. (PE excludes kWh associated with the Company's Lighting Schedules.)

Where:

NPC = Net Program Costs for the applicable EP are calculated as follows:

NPC = PPC + PCR

Where:

PPC = Projected Program Costs is an amount equal to Program Costs projected by the Company to be incurred during the applicable EP.

PCR = Program Costs Reconciliation is equal to the cumulative difference, if any, between the PPC revenues billed resulting from the application of the DSIM Rider through the end of the previous EP and the actual Program Costs incurred through the end of the previous EP (which will reflect projections through the end of the previous EP due to timing of adjustments). Such amounts shall include monthly interest on cumulative over- or under-balances at the Company's monthly Short-Term Borrowing Rate.

NTD = Net Throughput Disincentive for the applicable EP is calculated as follows:

NTD = PTD + TDR

Where:

PTD = Projected Throughput Disincentive is the Company's TD projected by the Company to be incurred during the applicable EP. For the detailed methodology for calculating the TD, see Sheet No. 5 of this Schedule 18.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

DETERMINATION OF DSIM RATES: (continued)

TDR = Throughput Disincentive Reconciliation is equal to the cumulative difference, if any, between the PTD revenues billed during the previous EP resulting from the application of the DSIM Rider and the Company's TD through the end of the previous EP calculated (which will reflect projections through the end of the previous EP due to timing of adjustments). Such amounts shall include monthly interest on cumulative over- or under-balances at the Company's monthly Short-Term Borrowing Rate.

NEO = Net Earnings Opportunity for the applicable EP is calculated as follows:

NEO = EO + EOR

EO = Earnings Opportunity is equal to the Commission-approved Earnings Opportunity award monthly amortization multiplied by the number of billing months in the applicable EP. The monthly amortization shall be determined by dividing the Earnings Opportunity award by 24.

EOR = Earnings Opportunity Reconciliation is equal to the cumulative difference, if any, between the EO revenues billed during the previous EP resulting from the application of the DSIM Rider and the monthly amortization of the Earnings Opportunity award through the end of the previous EP (which will reflect projections through the end of the previous EP due to timing of adjustments). Such amounts shall include monthly interest on cumulative over- or under-balances at the Company's monthly Short-Term Borrowing Rate.

NOA = Net Ordered Adjustment for the applicable EP is calculated as follows:

NOA = OA + OAR

OA = Ordered Adjustment is the amount of any adjustment to the DSIM Rider ordered by the Commission as a result of prudence reviews and/or corrections under this DSIM Rider. Such amounts shall include monthly interest at the Company's monthly Short-Term Borrowing Rate.

OAR = Ordered Adjustment Reconciliation is equal to the cumulative difference, if any, between the OA revenues billed during the previous EP resulting from the application of the DSIM Rider and the actual OA ordered by the Commission through the end of the previous EP (which will reflect projections through the end of the previous EP due to timing of adjustments). Such amounts shall include monthly interest on cumulative over- or under-balances at the Company's monthly Short-Term Borrowing Rate.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

DETERMINATION OF DSIM RATES: (continued)

The DSIM Rider components and total DSIM rate applicable to the individual rate schedules shall be rounded to the nearest $0.00001/kWh.

Program Costs, TD and any EO award will be allocated to each retail rate schedule for the KEEIA Cycle 1 Plan as follows:

1. Residential programs, excluding Income-Eligible Multi-Family and Income-Eligible Weatherization, will be allocated 100% to the Residential Class.
2. Non-Residential (or business) programs will be allocated 100% to the Non-Residential Class.
3. Income-Eligible Multi-Family and Income-Eligible Weatherization will be allocated 50/50 between the Residential Class and the Non-Residential Class.

THROUGHPUT DISINCENTIVE (TD) CALCULATION:

Monthly TD = The sum of the Throughput Disincentive Calculation for all KEEIA Programs applicable to (1) Residential Customers and (2) Commercial & Industrial Customers.

The TD Calculation for each KEEIA Program shall be determined by the formula:

TD$ = MS x NMR x NTGF

Where:

TD$ = Throughput Disincentive Dollars to be collected for a given calendar month, for a given Customer class.

MS = The sum of all KEEIA Programs' Monthly Savings in kWh, for a given month, for a given Customer class. The Monthly Savings in kWh for each KEEIA Program shall be determined by the formula:

$$\mathbf{MS = (MAS_{CM} + CAS_{PM} - RB) \times LS + HER}$$

Where:

MAS_{CM} = The sum of MC multiplied by ME for all Measures in a Program in the current calendar month (CM)

MC = Measure Count. Measure Count, for a given month, for a given Customer class, for each Measure is the number of each Measure installed in the current calendar month.

ME = Measure Energy. See Sheet 7 of this Schedule 18 for details on how the Measure Energy is determined.

CAS_{PM} = Cumulative sum of MAS for each KEEIA Program for KEEIA Cycle 1 for the prior calendar months (PM).

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

THROUGHPUT DISINCENTIVE (TD) CALCULATION: (continued)

NMR = Net Margin Revenue. Net margin revenue values for each Customer class are provided on Sheet No. 9 of this Schedule 18.

NTGF = Net-to-Gross Factor. The Net-to-Gross Factor is set at 1.00.

RB = Rebasing Adjustment. The Rebasing Adjustment shall equal the CAS applicable as of the date used for the KEEIA normalization in any general rate case resulting in new rates becoming effective during the accrual and collection of TD$ pursuant to this KEEIA Cycle 1. In the event of more than one general rate case resulting in new rates becoming effective during the accrual and collection of TD$ pursuant to this KEEIA Cycle 1, the Rebasing Adjustment shall include each and every prior Rebasing Adjustment calculation.

LS = Load Shape. The Load Shape is the monthly load shape percent for each Program, (attached as Appendix J to the Company's Application in Docket No. 16-KCPE-446-TAR).

HER = Monthly kWh savings for the Home Energy Reports Program measured and reported monthly by the Program implementer.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

TD CALCULATION: (continued)

Measure Energy will be determined as follows, for each Measure:

a. Prior to finalization of EM&V for KEEIA Cycle 1 Programs for the first 18 months, for Measures not listed under those Programs listed in (c) below, the ME is the annual total of normalized savings for each Measure at Customer meter per Measure defined in the TRM (attached as Appendix D to the Company's Application in Docket No. 16-KCPE-446-TAR).

b. After finalization of EM&V for KEEIA Cycle 1 Programs for the first 18 months, for Measures not listed under those Programs listed in (c) below, the ME is the annual total of normalized savings for each Measure at Customer meter per Measure defined in the updated TRM (which will be updated based on EM&V ex post gross adjustments determined for the first 18 months no later than 27 months after the commencement of KEEIA Cycle 1).

c. For custom Energy Efficiency Measures installed under the Business Energy Efficiency Rebate – Custom, Strategic Energy Management, Block Bidding, Whole House Efficiency, Income-Eligible Multi-Family or Income-Eligible Weatherization programs, the ME will be the annual value attributable to the installations reported monthly by the Program implementer.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

EARNINGS OPPORTUNITY (EO) ADJUSTMENTS:

The EO shall be adjusted for the difference between the TD$ billed and what the TD$ billed would have been if:

(1) The ME used in the calculation were the normalized savings for each measure at Customer meter per Measure determined through EM&V ex post gross analysis for each program year;

(2) The NTGF used in the calculation was the NTG value determined through EM&V, except that if the NTG value determined through EM&V is less than 0.90, the recalculation shall use 0.90, and if the NTG value determined through EM&V is greater than 1.0, the recalculation shall use 1.10.

(3) If the above adjustments are negative and would be greater than the otherwise applicable EO, these adjustments shall be limited to the value of the otherwise applicable EO.

(4) If the above adjustments plus the otherwise applicable EO are greater than $12 million, these adjustments shall be limited to the difference between the otherwise applicable EO and $12 million.

OTHER DSIM RIDER PROVISIONS:

The Company shall file an update to NMR rates by month by Customer class contemporaneous with filing any compliance tariff sheets in any general rate case reflecting the rates set in that case, and the billing determinants used in setting rates in that case.

Annual kWh savings per Measure will be updated prospectively in the Company’s TRM no later than 27 months after the commencement of the KEEIA Cycle 1 Plan based on EM&V ex post gross adjustments determined for the first 18 months.

TD will continue to be calculated and recovered until such time as a rate case is filed subsequent to the end of KEEIA Cycle 1 with a test period ending at or after the end of Cycle 1.

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

DSIM RATE ADJUSTMENT FILING SCHEDULE:

After the initial effective date of the DSIM Rider rate (January 1, 2017), the Company shall make a DSIM Rider rate adjustment filing to take effect each July and January thereafter during the term of this DSIM Rider. DSIM Rider rate adjustment filings shall be made at least sixty (60) days prior to their effective dates.

DISCONTINUANCE OF THE DSIM RIDER AND KEEIA PROGRAMS:

The Company reserves the right to discontinue the entire KEEIA Cycle 1 portfolio of programs if the Company determines that implementation of such programs is no longer reasonable due to changed factors or circumstances that have materially and negatively impacted the economic viability of such programs, as determined by the Company. In the event the Company determines to discontinue the KEEIA Programs, the Company shall provide notice to the Commission no less than thirty days' prior to discontinuance. Such notice of discontinuance would include discontinuance of the DSIM Rider and would include a methodology for recovery of any unrecovered Program Costs and TD.

DSIM RATE:

Charges associated with the DSIM rate will be effective January 1, 2017 and will apply to all applicable kWh during the term of this Schedule 18.

Customer bills currently include a separate line item for the Schedule 15 EE Rider charges. So as to reflect only one charge on the Customer bill reflecting costs associated with demand-side management, the DSIM rate on the Customer's bill will include both the DSIM rate determined hereunder and the EE Rider factor determined in accordance with Schedule 15 until such time as all of the costs approved by the Commission under the EE Rider are recovered by the Company. Such EE Rider costs will be included in the DSIM rate beginning July 1, 2017. The DSIM rate effective January 1, 2017 through June 30, 2017 is as follows:

Rate Schedule	DSIM ($/kWh)
Residential Service	$0.00204
Non-Residential Service	$0.00103

Issued: April 6, 2016
Month Day Year

Effective: January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

DEMAND-SIDE INVESTMENT MECHANISM (DSIM) RIDER
Schedule DSIM

NET MARGIN REVENUE (NMR) RATES BY RATE CLASS BY MONTH:

RATE CLASS	January	February	March	April	May	June	July	August	September	October	November	December
RES	$0.07756	$0.07755	$0.07797	$0.07970	$0.08055	$0.10829	$0.10829	$0.10829	$0.10829	$0.08061	$0.07995	$0.07833
MGS	$0.05812	$0.05826	$0.06054	$0.06345	$0.06531	$0.07933	$0.07528	$0.07553	$0.07541	$0.06388	$0.06236	$0.05873
SGS	$0.07976	$0.08039	$0.08366	$0.08765	$0.08957	$0.10514	$0.10142	$0.10298	$0.10134	$0.08762	$0.08573	$0.07998
LGS	$0.04556	$0.04512	$0.04721	$0.04912	$0.04926	$0.04856	$0.04784	$0.04902	$0.04801	$0.04870	$0.04771	$0.04569

EARNINGS OPPORTUNITY (EO) MATRIX:

KEEIA CYCLE 1 EARNINGS OPPORTUNITY MATRIX

Metric	Target	Target Unit	$/Unit	Unit	EO Target	As % of Total EO	EO Cap
HER launch and continuance of program over the 36-month KEEIA Cycle 1 period.		N/A		N/A	**$425,000**	5.00%	$425,000
IE Weatherization and IEMF launch and continuance of program over 36-month KEEIA Cycle 1 period.		N/A		N/A	**$170,000**	2.00%	$170,000
EE & DR MWh (excluding HER, IE Weatherization, and IEMF): Criteria will be first-year cumulative incremental MWh.	71,940.190	MWh	$21.27	$/MWh	**$1,530,000**	18.00%	$1,989,000
EE & DR MW (excluding HER, IE Weatherization, IEMF, and DRI): Criteria will be first-year cumulative incremental MW coincident with system peak.	33.233	MW	$166,250.41	$/MW	**$5,525,000**	65.00%	$8,287,500
DRI MW: Criteria will be savings achieved in Year 3 of KEEIA Cycle 1 period.	15.032	MW	$56,546	$/MW	**$850,000**	10.00%	$1,105,000
Total Earnings Opportunity					**$8,500,000**	100.00%	$11,976,500

Note: Targets are based on Cumulative Savings at the meter.

Earnings opportunity will be recovered upon approval of Final EM&V results.

SMALL GENERAL SERVICE
Schedule SGS **(Continued)**

DETERMINATION OF HOURS USE:

Total Hours Use in the Summer Season shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. Total Hours Use in the Winter Season shall be determined by dividing the total monthly kWh on all meters (excluding separately metered space heat kWh) by the Monthly Maximum Demand (excluding separately metered space heat kW) in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand (excluding separately metered space heat kW in the Winter Season) by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer’s transformer. In that event, the customer’s metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer’s metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

MEDIUM GENERAL SERVICE
Schedule MGS **(Continued)**

DETERMINATION OF DEMANDS (Continued):

BILLING DEMAND:

Billing Demand shall be equal to the higher of: (a) the Monthly Maximum Demand in the current month or (b) the Minimum Demand.

DETERMINATION OF HOURS USE:

Total Hours Use in the Summer Season shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. Total Hours Use in the Winter Season shall be determined by dividing the total monthly kWh on all meters (excluding separately metered space heat kWh) by the Monthly Maximum Demand (excluding separately metered space heat kW) in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand (excluding separately metered space heat kW in the Winter Season) by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

LARGE GENERAL SERVICE
Schedule LGS **(Continued)**

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

For substation voltage customers metered at primary or secondary voltage level, the metered demand and energy shall be increased by 1.20% (metered at primary voltage) or 3.56% (metered at secondary voltage), or alternatively, compensation metering may be installed.

For transmission voltage customers metered at substation, primary, or secondary voltage level, the metered demand and energy shall be increased by 0.90% (metered at substation voltage), 2.11% (metered at primary voltage), or 4.50% (metered at secondary voltage), or alternatively, compensation metering may be installed.

SERVICE AT TRANSMISSION VOLTAGE:

When a customer receives service at transmission voltage through a lease arrangement (or another type of arrangement where financial responsibility is assumed), then additional applicable terms and conditions shall be covered in the lease agreement (or financial responsibility arrangement).

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

SMALL GENERAL SERVICE – SPACE HEATING
Schedule SGA **(Continued)**

DETERMINATION OF DEMANDS:

Demand will be determined by demand instruments or, at the Company's option, by demand tests.

MONTHLY MAXIMUM DEMAND:
The Monthly Maximum Demand is defined as the highest demand indicated in any 30-minute interval during the month on all meters.

FACILITIES DEMAND:

Facilities Demand shall be equal to the highest Monthly Maximum Demand occurring in the last twelve (12) months including the current month.

DETERMINATION OF HOURS USE:

Total Hours Use shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

MEDIUM GENERAL SERVICE – SPACE HEATING
Schedule MGA **(Continued)**

DETERMINATION OF HOURS USE:

Total Hours Use shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

LARGE GENERAL SERVICE – SPACE HEATING
Schedule LGA **(Continued)**

DETERMINATION OF HOURS USE:

Total Hours Use shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

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THE STATE CORPORATION COMMISSION OF KANSAS

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Issued: April 6, 2016
Month Day Year

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By: /s/ Darrin R. Ives Vice President
Title

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Real-Time Pricing (FROZEN)
Schedule RTP **(continued)**

BILLING AND ADMINISTRATIVE CHARGE:

A billing and administrative charge of $45 per month is required to cover costs associated with the program.

COMMUNICATIONS CHARGE:

A communications charge of $115 per month is required to cover costs associated with the program. This charge will be waived if the Customer supplies Company-approved communications software. In addition, the Customer will provide access for the phone connection and will be responsible for supplying the phone line between the personal computer and the Company's metering equipment.

COMPANY-SUPPLIED COMPUTER CHARGE:

At the Customer's option, a KCPL standard notebook personal computer with a modem for receiving RTP prices using pre-loaded communications software, can be supplied by the Company. The Customer will pay the cost of the Company-supplied computer, which will be calculated based on the current monthly cost of a Company-standard computer. The Company-supplied computer may be used for other applications, as the Customer desires. However, the Customer will be responsible for any damages to the computer hardware or communications software resulting from such action.

Alternatively, the Customer may supply the computer, which must have minimum performance specifications as required by KCPL. In this case, there will be no computer charge.

REACTIVE DEMAND ADJUSTMENT:

Reactive demand associated both with the CBL and with incremental RTP load will be billed in accordance with the Customer's otherwise applicable, standard (non-RTP) rate schedule. The Customer's Standard Bill does not include any reactive demand charges paid by the Customer for the historical usage period.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATION:

Subject to Rules and Regulations filed with the Kansas Corporation Commission.

Real-Time Pricing (FROZEN)
Schedule RTP-Plus (continued)

BILLING AND ADMINISTRATIVE CHARGE:

A billing and administrative charge of $45 per month is required to cover costs associated with the program.

COMMUNICATIONS CHARGE:

A communications charge of $115 per month is required to cover costs associated with the program. This charge will be waived if the Customer supplies Company-approved communications software. In addition, the Customer will provide access for the phone connection and will be responsible for supplying the phone line between the personal computer and the Company's metering equipment.

COMPANY-SUPPLIED COMPUTER CHARGE:

At the Customer's option, a KCPL standard notebook personal computer with a modem for receiving RTP prices using pre-loaded communications software, can be supplied by the Company. The Customer will pay the cost of the Company-supplied computer, which will be calculated based on the current monthly cost of a Company-standard computer. The Company-supplied computer may be used for other applications, as the Customer desires. However, the Customer will be responsible for any damages to the computer hardware or communications software resulting from such action.

Alternatively, the Customer may supply the computer, which must have minimum performance specifications as required by KCPL. In this case, there will be no computer charge.

REACTIVE DEMAND ADJUSTMENT:

Reactive demand associated both with the CBL and with incremental RTP-Plus load will be billed in accordance with the Customer's otherwise applicable, standard (non-RTP-Plus) rate schedule. The Customer's Standard Bill does not include any reactive demand charges paid by the Customer for the historical usage period.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE TOC-1

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule TOC-1 Sheet 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~December 13, 2012~~October 1, 2015

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 3 Sheets

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OF RATES FOR STATE OF KANSAS

Issued: ~~September 10, 2015~~April 6, 2016
Month Day Year

Effective: ~~October 1, 2015~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE TOC-1

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule TOC-1 Sheet 2

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~December 13, 2012~~October 1, 2015

No supplement or separate understanding shall modify the tariff as shown hereon.

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Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE TOC-1

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule TOC-1 Sheet 3

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~December 13, 2012~~October 1, 2015

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 3 of 3 Sheets

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By: /s/ Darrin R. Ives Vice President
Title

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~~**INCOME-ELIGIBLE WEATHERIZATION**~~

~~**Schedule IEW**~~

~~**PURPOSE:**~~

~~This Program is intended to assist residential Customers in reducing their energy usage by weatherizing the homes of qualified Customers.~~

~~**AVAILABILITY:**~~

~~This Program is available to any Customer currently receiving service under any generally available residential rate schedule for a minimum of one year prior to completion of an application for weatherization assistance and who also meets the additional Customer eligibility requirements defined in the agreement between the Company and the Social Service Agency. The Company reserves the right to modify or terminate the Program at any time subject to Commission approval.~~

~~**PROGRAM ADMINISTRATION:**~~

~~The Program will be administered by Kansas-based Social Service Agencies that are directly involved in qualifying and assisting Customers under this Program.~~

~~**PROGRAM ADMINISTRATION COSTS:**~~

~~Program funds cannot be used for administrative costs except those incurred by the Social Service Agency that are directly related to qualifying and assisting Customers under this Program. The amount of reimbursable administrative costs per Program year shall not exceed 13 percent of the total Program funds, as defined in the agreement between the Company and the Social Service Agency, that are utilized by the Social Service Agency within a Program year.~~

~~**PROGRAM GRANTS:**~~

~~The total amount of grants offered to a Customer will be defined in the agreement between the Company and the Social Service Agency using established criteria for Income-Eligible Weatherization. The average expenditure per Customer in each program year shall not exceed the Adjusted Average Expenditure Limit for weatherization determined by the U.S. Department of Energy that is applicable for the month that the weatherization is completed.~~

Reserved for Future Use

~~**INCOME-ELIGIBLE WEATHERIZATION**~~

~~**Schedule IEW (Continued)**~~

~~**CUSTOMER ELIGIBILITY:**~~

~~The Social Service Agency will select Customers eligible for Income-Eligible Weatherization using the following criteria: The Customer's household earnings meet the low income guidelines for weatherization specified by the Department of Energy (DOE) for the number of persons in the residence, the residence must have energy consumption greater than 3,000 kWh per year, the Customer must have received electric service from the Company for a minimum of one year prior to completion of an application, and other eligibility requirements defined in the agreement between the Company and Social Service Agency.~~

~~**PROGRAM FUNDING:**~~

~~The Company will provide for incentive payments, marketing costs, evaluation cost, and Program administrative and delivery costs. This Program and its costs shall be eligible for recovery under the Company's Energy Efficiency Rider, Schedule EE, subject to the provisions thereof.~~

~~**EVALUATION:**~~

~~Evaluation, measurement and verification of the Program will be completed consistent with requirements established by the Commission in Docket No. 08-GIMX-442-GIV and Docket No. 10-GIMX-013-GIV.~~

Issued: ~~July 18, 2013~~April 6, 2016
Month Day Year

Effective: ~~October 23, 2014~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives ~~Sr. Director~~Vice President
Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 7

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 7 Sheet 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~May 27, 2011~~October 23, 2014

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 3 Sheets

Reserved for Future Use

~~**RESIDENTIAL, SMALL AND MEDIUM GENERAL SERVICE AIR CONDITIONER CYCLING RIDER**~~
~~**PROGRAMMABLE THERMOSTAT PROGRAM**~~
~~**Schedule PT**~~

~~**PURPOSE:**~~

~~The Programmable Thermostat Program (Program) is intended to help reduce system peak load and thus defer the need for additional capacity. The Program accomplishes this by cycling a Participant's air conditioning unit (and/or other appliances) temporarily in a Company coordinated effort to limit overall system peak load.~~

~~**AVAILABILITY:**~~

~~This Program is available to any Customer currently receiving or requesting service under any residential rate schedule or any small or medium general service rate schedule. Customers must also have adequate paging, radio, Wi-Fi or other acceptable technology coverage and have a working central air conditioning system of suitable size and technology to be controlled by the programmable thermostat and economically contribute to the Program. Residential property owner's (owner occupant or landlord for a rental property) permission is required to participate. Commercial property owner's permission may be required for the tenant to participate, based on thermostat ownership. The Company may limit the number of participants based on available Program budget. The Company reserves the right to modify or terminate the Program at any time subject to Commission approval.~~

~~**CONTROLS AND INCENTIVES:**~~

~~Participating Customers will receive a programmable thermostat that can be controlled via signals sent to the unit by the Company or its assignees. During a curtailment event, the Company or its assignee will send a signal to the thermostat that will cycle the air conditioner and/or other equipment. Customers may use the programmable thermostat throughout the year to improve heating and cooling efficiency. Other Company-supplied control devices may be substituted for, or provided in addition to, the programmable thermostat to control other appliances such as pool pumps or electric water heaters with the Customer's permission.~~

~~**CYCLING METHODS:**~~

~~The Company may elect to cycle participating Customers' air conditioner units either by raising the thermostat setting, or by directly cycling the compressor unit.~~

~~**NOTIFICATION:**~~

~~The Company will notify participating Customers of a curtailment event via a website and/or on the thermostat. The notification can occur prior to or at the start of a curtailment event.~~

~~**CURTAILMENT SEASON:**~~

~~The curtailment season will extend from June 1 to September 30.~~

Issued: ~~July 18, 2013~~April 6, 2016
Month Day Year

Effective: ~~October 23, 2014~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives ~~Sr. Director~~Vice President
Title

Reserved for Future Use

~~**RESIDENTIAL, SMALL AND MEDIUM GENERAL SERVICE AIR CONDITIONER CYCLING RIDER**~~
~~**PROGRAMMABLE THERMOSTAT PROGRAM**~~
~~**Schedule PT**~~ ~~**(Continued)**~~

~~**CURTAILMENT LIMITS:**~~

~~The Company may call a curtailment event any weekday, Monday through Friday, excluding Independence Day and Labor Day, or any day celebrated as such. A curtailment event occurs whenever the thermostat is being controlled by the Company. The Company may call a maximum of one curtailment event per day lasting no longer than four (4) hours per Customer. The Company is not required to curtail all participating Customers simultaneously and may stagger curtailment events across participating Customers.~~

~~**CURTAILMENT OPT OUT PROVISION:**~~

~~Participating Customers may opt out of one air conditioning cycling curtailment event each month during the Curtailment Season by notifying the Company at any time prior to or during a curtailment event. Notification must be communicated to the Company by using the Company's website (www.kcpl.com) or by calling the Company at the telephone number provided with the air conditioner cycling agreement. If an event does not occur on the day the Customer requested to opt out, the Customer is not considered as having used their once-per-month opt out provision.~~

~~**NEED FOR CURTAILMENT:**~~

~~Curtailments may be requested for operational or economic reasons. Operational curtailments may occur when any physical operating parameter(s) approach a constraint on the generation, transmission or distribution systems or to maintain the Company's capacity margin requirement. Economic reasons may include any occasion when the marginal cost to produce or procure energy or the price to sell the energy in the wholesale market is greater than a Customer's retail price.~~

~~**CONTRACT TERM:**~~

~~Initial contracts will be for a term of three years. Thereafter, the contract will continue to be in force, terminable on 90 days written notice. At the end of the initial contract term, the thermostat becomes the Customer's property; and, so long as the contract is in force, the Company will provide maintenance and repair to the programmable thermostat as may be required due to normal use. If the Customer leaves the Program prior to the end of the initial contract, the Company will have 60 days thereafter to remove the thermostat and/or other control equipment; otherwise, any equipment previously installed at Company expense becomes the Customer's property. With the exception of thermostats, the Company may retain ownership of all other Company supplied control devices after the initial contract term.~~

Reserved for Future Use

~~**RESIDENTIAL, SMALL AND MEDIUM GENERAL SERVICE AIR CONDITIONER CYCLING RIDER**~~
~~**PROGRAMMABLE THERMOSTAT PROGRAM**~~
~~**Schedule PT**~~ ~~**(Continued)**~~

~~**PROGRAM FUNDING:**~~

~~The Company will provide for incentive payments, marketing costs, evaluation cost, and Program administrative and delivery costs. Such costs shall be eligible for recovery under the Company's Energy Efficiency Rider, Schedule EE, subject to the provisions thereof.~~

~~**EVALUATION:**~~

~~Evaluation, measurement and verification of the Program will be completed consistent with requirements established by the Commission in Docket No. 08-GIMX-442-GIV and Docket No. 10-GIMX-013-GIV.~~

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 8

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 8 Sheet 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~May 27, 2011~~October 23, 2014

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 1 Sheets

Reserved for Future Use
~~**BUILDING OPERATOR CERTIFICATION PROGRAM**~~
~~**Schedule BOC**~~

~~**PURPOSE:**~~

~~This voluntary Program is designed to establish and encourage Building Operator Certification through the Northwest Energy Efficiency Council's Building Operator Certification Level I and Level II curriculums to encourage energy efficient operation of buildings. In support of a partnership with the Midwest Energy Efficiency Alliance (MEEA), the Company will:~~

- ~~Reimburse the annual cost to license the Level I and Level II curriculums for the Company's Kansas service territory.~~
- ~~Reimburse portions of the tuition costs for Building Operators associated with properties in the Company's service area who successfully complete the certifications.~~

~~**AVAILABILITY:**~~

~~The certification courses funded by this Program will be available through MEEA for any building operators, managers and consultants employed by or associated with a company having at least one Kansas commercial property receiving electrical service from the Company.~~

~~Reimbursements for the successful completion of the certifications are available to any participant associated with at least one Kansas commercial property receiving electrical service from the Company.~~

~~The Company reserves the right to modify or terminate the program at any time, subject to Commission approval.~~

~~**PROGRAM ADMINISTRATION:**~~

~~The Program will be administered by MEEA. The Company will utilize an internal program manager to conduct its internal oversight of the program.~~

~~**PROGRAM FUNDING:**~~

~~The Company will provide for incentive payments, marketing costs, evaluation cost, and Program administrative and delivery costs. This Program and its costs shall be eligible for recovery under the Company's Energy Efficiency Rider, Schedule EE, subject to the provisions thereof.~~

~~KCP&L will reimburse MEEA for the amount paid annually to license the Level I and Level II curriculums for the KCP&L area.~~

~~Tuition reimbursements of $575 per certification level will be paid to the entity paying the tuition. To receive the reimbursement, qualified participants must complete a reimbursement request and submit it to the Company. The reimbursement form is available by contacting the Company directly.~~

~~**EVALUATION:**~~

~~Evaluation, measurement and verification of the Program will be completed consistent with requirements established by the Commission in Docket No. 08-GIMX-442-GIV and Docket No. 10-GIMX-013-GIV.~~

Issued: ~~July 18, 2013~~April 6, 2016
Month Day Year

Effective: ~~October 23, 2014~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives ~~Sr. Director~~Vice President
Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 9

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 9 Sheet 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~May 22, 2006~~July 1, 2011

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 2 Sheets

Reserved for Future Use

~~**ENERGY AUDIT AND ENERGY SAVING MEASURES RIDER (FROZEN)**~~

~~**Schedule ER**~~

~~**PURPOSE:**~~

~~The Energy Audit And Saving Measures Program (Program) is designed to encourage more effective utilization of electric energy through energy efficiency improvements in the building shell, installation of efficient electrical equipment in new construction, or the replacement of inefficient electrical equipment with efficient electrical equipment, by providing a rebate for a portion of the costs of an energy audit and related upgrades that improve efficient use of electricity.~~

~~These programs are set forth in the Stipulation and Agreement approved by the Kansas Corporation Commission in Docket No. 04-KCPE-1025-GIE.~~

~~**AVAILABLITY:**~~

~~This Program is no longer available effective June 22, 2011. Rebates for existing subscribers of record at this date will be processed.~~

~~This Program is available to any of the Company's customers served under SGS, MGS, LGS, SGA, MGA, or LGA rate schedules. The total amount of all rebates shall not exceed the funds set forth in Appendix B of the Stipulation and Agreement for the Energy Audit and Energy Saving Measures Rebate Program. This Program will terminate five (5) years after the original effective date of this tariff sheet. All rebates will be distributed based upon the receipt date of a customer's application.~~

~~**TERMS:**~~

~~Energy Audit Rebate: This Program provides a rebate for an energy audit. To be eligible for an energy audit rebate the customer must have an energy audit performed by a certified commercial energy auditor and implement at least one of the audit recommendations that qualifies for a retrofit energy savings measures rebate. The rebate amount will be 50% of the audit cost up to $300 for customers with facilities less than 25,000 square feet. For customers with facilities greater than 25,000 square feet, the rebate amount will be 50% of the audit cost up to $500. Customers with multiple facilities may apply for multiple audit rebates subject to Program limitations. The amount of all Energy Audit Rebates shall not exceed $16,080 per year.~~

~~Energy Savings Measures Rebate: This Program provides a rebate for installing qualifying higher energy efficiency equipment or systems, or replacing or retrofitting HVAC systems, motors, lighting, pumps or other qualifying equipment or systems with higher energy efficiency equipment or systems. Both new construction projects and retrofit projects are eligible to apply. Customers requesting a rebate for an energy saving measures project will submit an application through KCP&L's website (www.kcpl.com) or on paper. Rebates can be for either new construction or retrofit projects and will be analyzed to ensure the Societal test result is 1.0 or higher.~~

Issued: ~~April 15, 2011~~April 6, 2016
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Effective: ~~July 1, 2011~~January 1, 2017
Month Day Year

By: ~~Mary Britt Turner~~/s/ Darrin R. Ives ~~Director~~Vice President
Title

Reserved for Future Use

~~**ENERGY AUDIT AND ENERGY SAVING MEASURES RIDER (FROZEN)**~~
~~**Schedule ER**~~

~~**(Continued)**~~

~~Energy Saving Measures Rebate: (continued)~~

~~Rebate applications for different energy saving measures at the same facility may be submitted. A customer with multiple facilities may submit applications for each facility. The maximum amount of each rebate will be calculated as the lesser of the buy down to a two year payback or 50% of the incremental cost of the higher efficiency equipment, system, or energy saving measure. The rebate will be issued after the project is complete. Initially, the maximum amount of Energy Saving Measures Rebate that a customer can receive during a Program year is limited based upon the rate schedule that each facility is billed under as follows:~~

~~SGS or SGA – Retrofit Project: $4,907 New Construction: $6,134~~

~~MGS or MGA - Retrofit Project: $7,968 New Construction: $9,960~~

~~LGS or LGA - Retrofit Project: $28,114 New Construction: $35,142~~

~~Customers may apply for additional rebates during a Program year should Program funding allow after review by the Company of projects approved and/or paid during the first six months of a Program year.~~

~~Initially, the maximum aggregate dollar amount of Energy Saving Measures Rebates that will be issued during each Program year is further limited based upon the rate schedule that each facility is billed under as follows:~~

~~SGS or SGA – Retrofit Project: $49,068 New Construction: $61,336~~

~~MGS or MGA - Retrofit Project: $79,678 New Construction: $99,597~~

~~LGS or LGA - Retrofit Project: $112,454 New Construction: $140,567~~

~~**PROGRAM FUNDING:**~~

~~To the extent the annual funds set forth above for the Energy Audit and Energy Saving Measures Rebate Program exceed the total cost expended on the Program in any year, the amount of excess shall be "rolled over" to be utilized for the rebate Program in the succeeding year and the maximum amount of the rebates will be adjusted accordingly; however, at the end of the fifth year any remaining excess shall be made available for other energy efficiency programs. Projects that have been approved may be scheduled in the succeeding Program year but not beyond the end of the fifth year of the Program.~~

RESIDENTIAL SERVICE
Schedule R **(Continued)**

SUMMER AND WINTER SEASONS:

The Summer Season is four consecutive months, beginning and effective May 16 and ending September 15, inclusive. The Winter Season is eight consecutive months, beginning and effective September 16 and ending May 15. Customer bills for meter reading periods including one or more days in both seasons will reflect the number of days in each season.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (~~EER~~DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

RESIDENTIAL OTHER USE
Schedule ROU

AVAILABILITY:

This rate schedule applies to residential customers who do not qualify under any other residential rate. Customers qualifying for this rate will generally be those with well pumps, barns, machine sheds, detached garages, home workshops, or recreational vehicles whose meter is not connected to a single or multiple occupancy dwelling unit. This rate schedule cannot be used for any commercial or industrial customer.

RATE: 2RO1A

	Summer	Winter
Customer Charge (per month)	$14.00	$14.00
Energy Charge (per kWh)		
All Energy	$0.12643	$0.09934

MINIMUM:

Minimum Monthly Bill:

(1) Customer Charge; plus

(2) Any additional charges for line extensions, if applicable; plus

SUMMER AND WINTER SEASONS:

The Summer Season is four consecutive months, beginning and effective May 16 and ending September 15, inclusive. The Winter Season is eight consecutive months, beginning and effective September 16 and ending May 15. Customer bills for meter reading periods including one or more days in both seasons will reflect the number of days in each season.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

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- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (DSIM~~EER~~)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

Reserved for Future Use

~~**COOL HOMES PROGRAM (FROZEN)**~~

~~**Schedule CHP**~~

~~**PURPOSE:**~~

~~The Cool Homes Program (CHP or Program) is designed to encourage residential Customers to:~~

- ~~Have working,central cooling systems evaluated and, if feasible, brought back to factory specifications (re-commissioned), or~~
- ~~Replace less efficient, working central cooling systems with high efficiency central cooling systems.~~

~~The intent of Kansas City Power & Light Company to offer this Program was set forth in Appendix B, described in the "Energy Efficiency" section, of the Stipulation and Agreement approved by the Kansas Corporation Commission in Docket No. 04-KCPE-1025-GIE.~~

~~**DEFINITIONS:**~~

~~CheckMe!® – A testing process developed by Proctor Engineering Group, Ltd. used to properly evaluate air conditioning system performance.~~

~~EER – *Energy Efficiency Ratio*, the efficiency rating for the air conditioner or heat pump at a particular pair of external and internal temperatures. Calculated by dividing the amount of cooling put out by an air conditioning system, in British thermal units (Btu), divided by the amount of energy put in to it in watts (W). If the air conditioning capacity of a heat pump is 48,000 Btu and the compressor, fan and pumps consume 3.43 kW (3,430 watts), the EER is: 48,000 / 3,430 = 14.0.~~

~~HVAC – Heating, Ventilation, and Air Conditioning.~~

~~Program Administrator – The Program will be implemented by a third-party vendor specializing in programs of this type.~~

~~CHP HVAC Contractor – A properly licensed HVAC contractor who requests to participate in the Cool Homes Program and completes training courses conducted by the Program Administrator.~~

~~SEER – *Seasonal Energy Efficiency Ratio*, the efficiency rating for the air conditioner or heat pump over a range of expected external temperatures (i.e., the temperature distribution for the geographical location for the SEER test). SEER rating is the Btu of cooling output during a simulated, typical cooling season divided by the total electric energy input in watt-hours during the same period. The relationship between SEER and EER is relative because equipment performance is dependent on seasonal temperature, humidity, and air pressure patterns.~~

~~**AVAILABILITY:**~~

~~This Program is no longer available effective June 22, 2011. Rebates for existing subscribers of record at this date will be processed.~~

~~This Program is available to any current Customer with a working, central home cooling system receiving service under any generally available residential rate schedule.~~

Reserved for Future Use

~~**COOL HOMES PROGRAM (FROZEN)**~~

~~**Schedule CHP**~~ ~~**(Continued)**~~

~~**PROGRAM PROCESS:**~~

~~Prospective Customer participants will be identified in three ways:~~

- ~~Customer electric usage data will be evaluated to identify Customers with a high probability of operating less efficient central air conditioning equipment.~~
- ~~Participating CHP HVAC Contractors may identify existing Customers within the Company service area that are suitable for the Program.~~
- ~~Customers interested in the Program, but not identified through the above means may contact a participating CHP HVAC Contractor or the Company directly. A listing of CHP HVAC Contractors will be posted on the Company website.~~

~~The following general process will be followed to serve Customers in the Program:~~

- ~~The Program Administrator will assign participating Customers to a CHP HVAC Contractor for service.~~
- ~~The CHP HVAC Contractor will evaluate the Customer's cooling system using CheckME!™.~~
- ~~Customers with working equipment that can be re-commissioned to operate above an EER rating of 8.0 will be offered an opportunity to return the equipment as close as possible to manufacturer specifications at no cost to the customer. Re-commissioning efforts will be limited to refrigerant charge, non-ductwork air flow system adjustments, and basic filters.~~
- ~~All participating Customers will receive a cost estimate for replacement of their system with a higher efficiency system. The Customer will be responsible for the cost of the replacement equipment. (Estimates for higher efficiency systems will include the applicable incentives.)~~
- ~~The Customer may choose not to re-commission or replace their equipment.~~
- ~~Four Compact Florescent Lights will be given to all Customers completing the initial CheckME!™ process regardless of their equipment choices.~~
- ~~Where work is performed, a second CheckME!™ evaluation will be completed to verify the re-commissioning modifications or ensure the quality installation of new equipment.~~
- ~~Incentives are provided to Customers through the CHP HVAC Contractors to help offset equipment costs and provide for quality installation practices.~~

~~**PROGRAM ADMINISTRATION:**~~

~~The CHP Program will be implemented by the Program Administrator. The Program Administrator will be responsible for market research, marketing, training, incentive processing, and status reporting associated with the Program. The Company will maintain oversight of the Program through monthly, quarterly, and yearly status reports and meetings with the Administrator.~~

~~The Program Administrator will identify and contact HVAC Contractors associated with national brand networks or industry associations to recruit CHP HVAC Contractors. Other HVAC Contractors wishing to become CHP HVAC Contractors may contact the Company directly for consideration. Prospective Contractors will be required to complete training courses conducted by the Program Administrator.~~

Reserved for Future Use

~~**COOL HOMES PROGRAM (FROZEN)**~~

~~**Schedule CHP**~~ ~~**(Continued)**~~

~~**PROGRAM COST:**~~

~~Program related services and incentives will be paid to the CHP HVAC Contractor by the Program Administrator who will then bill the Company on a per unit basis. Unit pricing is defined in agreements with the Program Vendor. Incentive amounts of $650 per unit for installation of SEER 14.0 or SEER 15.0 rated equipment and $850 per unit for installation of SEER 16.0 or above rated equipment will be paid to the HVAC contractor. The CHP HVAC Contractor will pass the equipment incentive to the Customer in the form of an itemized credit on the transaction documents. Similarly, if re-conditioning is feasible the entire cost will be paid by the Company through the Program Administrator to the CHP HVAC Contractor.~~

~~The total expenditure for each year of the Program is estimated to be:~~

	~~2007~~	~~2008~~	~~2009~~	~~2010~~	~~2011~~	~~Total~~
~~Program~~	~~$1,805,746~~	~~$1,856,768~~	~~$1,984,321~~	~~$1,963,451~~	~~$2,019,205~~	~~$9,629,491~~
~~KS (48.5%)~~	~~$875,787~~	~~$ 900,532~~	~~$962,396~~	~~$952,274~~	~~$979,314~~	~~$4,670,303~~

~~Program expenditures are not to exceed a maximum of $9,629,491 over the 5-year pilot program timeframe. Payments will be provided until budgeted funds are expended for the year. To the extent there are excess funds for a given year, the amount of excess shall be “rolled over” to be utilized for the Program in the succeeding year.~~

~~**TERM OF PROGRAM:**~~

~~The term of this Program Administrator will be five years from the effective date of the CHP tariff sheets, pursuant to the terms defined in agreements with the Program Administrator. The Company reserves the right to modify or terminate this Program at any time, subject to Commission Approval~~

~~**EVALUATION:**~~

~~Program evaluation will be conducted by a third party and will include random on-site inspections, engineering analysis, and process and impact analysis. Spot metering and run-time data will also be collected to verify the connected load and full load hour estimates in the engineering analysis along with pre-post billing analysis. The evaluation will also include a non-participant group. Upon CHP approval, a detailed evaluation plan will be developed.~~

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 14

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule ~~1~~14 Sheet ~~3~~ 1

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~March 10, 2008~~July 1, 2011

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 3 Sheets

Reserved for Future Use

~~ENERGY STAR® New Homes (FROZEN)~~

~~Schedule NH~~

~~PURPOSE:~~

~~This ENERGY STAR® New Homes (ESNH) Program is designed to improve the energy efficiency of new homes built in the residential construction market by applying efficient construction techniques and high-performance products (windows, doors, appliances, lighting, and heating and cooling systems) in accordance with guidelines set by the U.S. Environmental Protection Agency (EPA) through the ENERGY STAR® program. Homes built under the ENERGY STAR® guidelines are typically 20–30% more energy efficient than standard homes.~~

~~The Company's participation in this Program was set forth in the Stipulation and Agreement approved by the Kansas Corporation Commission (Commission) in Docket No. 04-KCPE-1025-GIE (Stipulation and Agreement).~~

~~DEFINITIONS:~~

~~Builder – Companies or individuals in the business of constructing new, residential homes within the Company's service territory.~~

~~HERS Index – The Home Energy Rating System (HERS) Index is a scoring system established by the Residential Energy Services Network. In that system homes are given a score indicating their relative level of energy efficiency:~~

- ~~homes built to the specifications of the HERS Reference Home, based on the 2006 International Energy Conservation Code (IECC), score a HERS Index of 100,~~
- ~~homes that produce as much energy as they consume in a year, achieving net zero energy consumption, score a HERS Index of 0 and~~
- ~~homes that do not meet the 2006 IECC would have a HERS Index greater than 100.~~

~~The lower a home's HERS Index, the more energy efficient it is in comparison to the HERS Reference Home. Each 1-point decrease in the HERS Index corresponds to a 1% reduction in energy consumption compared to the HERS Reference Home. Residential Energy Services Network is a non-profit corporation recognized by the EPA as a national standards making body for building energy efficiency rating systems. The International Energy Conservation Code is a model energy building code produced by the International Code Council® providing minimum energy efficiency provisions for residential and commercial buildings.~~

~~HERS Rater – A person certified by the Residential Energy Services Network, in accordance with its standards, to produce accurate and fair HERS Index ratings.~~

~~Homes – Newly constructed residential structures three stories or less including site constructed homes, attached or detached homes, single or low-rise multi-family residential buildings, system-built homes (structural insulated panels or modular) and log homes.~~

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By:	~~Mary Britt Turner~~/s/ Darrin R. Ives — ~~Director~~Vice President (Title)

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 14

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule ~~2~~14 Sheet ~~3~~ 2

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~March 10, 2008~~July 1, 2011

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 2 of 3 Sheets

Reserved for Future Use

~~**ENERGY STAR® New Homes (FROZEN)**~~

~~**Schedule NH**~~

~~**(continued)**~~

~~**AVAILABILITY:**~~

~~This Program is no longer available effective June 22, 2011. Rebates for existing subscribers of record at this date will be processed.~~

~~The training, rating and incentive elements of the Program are available to Builders constructing Homes within the Company's service territory. The Company reserves the right to modify or terminate this Program at any time, subject to Commission approval.~~

~~**PROGRAM PROCESS:**~~

1. ~~The Company will complete the necessary requirements to obtain *Partner* status with ENERGY STAR® to promote the ESNH Program regionally. *Partner* status will provide the Company access to technical information and tools needed to promote and sponsor the Program.~~
2. ~~The Company will work with Builders in the KCPL service territory to help them achieve *Partner* status with ENERGY STAR® under the ESNH Program. *Partner* status for Builders will provide access to technical information and tools needed to comply with the Program and the terms associated with displaying the ENERGY STAR® qualification.~~
3. ~~As necessary, the Company will expand the availability of certified HERS Raters within the Company's service territory. The HERS program will be used to provide independent, third party verification of ESNH construction.~~
4. ~~Builders will construct Homes according to one of the following agreement structures:~~
    a. ~~Performance agreement – In this structure, Builders submit construction plans for analysis prior to construction. Using standardized software, the analysis will yield a HERS Index rating. Homes built to the specifications of construction plans analyzed to have an index of 85 or below will qualify for ENERGY STAR® rating.~~
    b. ~~Prescriptive agreement – In this structure, Builders apply specific energy efficiency measures, pre-defined by ENERGY STAR® and available through its website, to a Home. The measures include high efficiency heating and cooling equipment, ductwork, windows, water heating, lighting, and appliances. Where applicable, ENERGY STAR® rated equipment is specified.~~
5. ~~For single Homes, the Builder will retain a HERS Rater to complete onsite inspections. Inspections will occur twice, once during the construction and once following completion of the Home to verify compliance with ENERGY STAR® requirements. Inspection costs of up to $750 per home will be paid by the Company.~~
6. ~~For Homes that achieve ENERGY STAR® qualification, Builders may request a rebate of $800 per Home toward the incremental cost of meeting ENERGY STAR® requirements. The rebate request form is available from the Company.~~
7. ~~The Company will promote the Program to residential Customers through mediums that may include press releases, direct mailings, bill messages, bill inserts, trade ally communications, and web site materials.~~
8. ~~The Company will obtain ENERGY STAR® materials and establish a clearinghouse of training materials, marketing resources and tools that can be used by Builders and the Company to implement and promote the Program.~~

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By: ~~Mary Britt Turner~~/s/ Darrin R. Ives ~~Director~~Vice
Title

Reserved for Future Use

~~**ENERGY STAR® New Homes (FROZEN)**~~

~~**Schedule NH**~~

~~**(continued)**~~

~~**PROGRAM ADMINISTRATION:**~~

~~The Program will be administered by the Company in compliance with terms established by ENERGY STAR®.~~

~~**PROGRAM COST:**~~

~~The total expenditure for each year of the Program is estimated to be:~~

	~~2008~~	~~2009~~	~~2010~~	~~2011~~	~~2012~~	~~Total~~
~~Program~~	~~$80,000~~	~~$920,000~~	~~$1,735,000~~	~~$1,685,000~~	~~$1,685,000~~	~~$6,105,000~~
~~KS (48.5%)~~	~~$38,800~~	~~$446,200~~	~~$841,475~~	~~$817,225~~	~~$817,225~~	~~$2,960,925~~

~~These amounts will provide for incentive payments, ratings, marketing costs, evaluation cost, and Company administrative costs. Payments will be provided until the budgeted funds for the total Program are expended. To the extent there are excess funds for a given year, the amount of excess shall be "rolled over" to be utilized for the Program in the succeeding year.~~

~~**EVALUATION:**~~

~~Evaluation, measurement and verification of the Program will be completed consistent with requirements established by the Commission in Docket No. 08-GIMX-442-GIV.~~

Issued: ~~April 15, 2011~~April 6, 2016
Month Day Year

Effective: ~~July 1, 2011~~January 1, 2017
Month Day Year

By: ~~Mary Britt Turner~~/s/ Darrin R. Ives ~~Director~~Vice
Title

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 15

KANSAS CITY POWER & LIGHT COMPANY

(Name of Issuing Utility)

Replacing Schedule 15 Sheet 1

Rate Areas No. 2 & 4

(Territory to which schedule is applicable)

which was filed July 1, 2008

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 1 of 2 Sheets

ENERGY EFFICIENCY RIDER (FROZEN)
Schedule EE

APPLICABILITY:

This Energy Efficiency (EE) Rider (Schedule EE) shall be applicable to all Kansas Retail Rate Schedules for KCPL with the exception of Lighting Schedules LS, AL, CL, ML, and TR.

PURPOSE:

This EE Rider is filed in compliance with the Commission's Order in Docket No. 07-KCPE-905-RTS and is designed to recover costs associated with Commission-approved Affordability, Energy Efficiency and Demand Response programs (EE Programs), including internal labor costs, incurred during the time period July 1, 2006 through December 31, 2007 (Program Costs). This EE Rider will be effective as of July 1, 2008 and will recover such Program Costs over the customer usage for the period July 1, 2008 through June 30, 2009. KCPL will file a new EE Rider for Commission approval on or before March 31, 2009 to recover EE Program costs incurred from January 1, 2008 through December 31, 2008 over the time period July 1, 2009 through June 30, 2010. Thereafter, KCPL will file a new EE Rider no later than March 31 of each year to recover EE Program costs incurred during the prior calendar year for recovery over the following July through June period.

BASIS:

Program Costs will be recovered using an EE factor applied to each customer's bill. The EE factor will be applied to the customer's usage on a kilowatt-hour basis ($/kWh). Retail customer charges for EE Program Costs are determined by multiplying the kilowatt-hours of electricity billed by the corresponding EE factor. The customer charges associated with this EE Rider will be identified and shown as a separate line on the customer's bill.

ENERGY EFFICIENCY RIDER AMOUNT CALCULATION:

A separate EE factor will be calculated for each customer class based upon the demand allocator and total kWh for each class. The EE factor (EEF) for each customer class will be calculated to recover the Program Costs for approved EE Programs from the specified period plus any applicable true up amount from the prior period by applying a class Demand Allocator and then dividing by the total kilowatt-hours (kWh) for that class as follows:

$$EEF_{(class)} = \frac{(EEC_n + TRUE_{n-1}) \times DA_{(class)}}{KWH_{n\,(class)}}$$

Where:

EEC_n = The actual costs associated with Commission-approved EE Programs, including internal labor costs, incurred during the applicable time period (n). These costs are recorded in Account 182441, the regulatory asset established to accumulate the Kansas jurisdictional cost of all Affordability, Energy Efficiency, and Demand Side Management programs in compliance with the Stipulation and Agreement in Docket No. 04-KCPE-1025-GIE.

Issued: ~~July 21, 2008~~April 6, 2016 (Month Day Year)	
Effective: January 1, 2017 (Month Day Year)	
By: ~~Chris Giles~~/s/ Darrin R. Ives — Vice President (Title)	

ENERGY EFFICIENCY RIDER (FROZEN)
Schedule EE **(continued)**

ENERGY EFFICIENCY RIDER AMOUNT CALCULATION: (continued)

$TRUE_{n-1}$ = The annual true-up amount for an EE Rider year, to be determined prior to filing the next EE Rider and to be applied to the subsequent EE factor calculation. The true-up amount will reflect any difference between the total EE revenue collected and the actual costs (EEC_n) for the previous applicable time period (n-1). Such true-up amount may be positive or negative. The true-up amount used to calculate the EEF for the first EE Rider equals zero.

$DA_{(class)}$ = The demand allocator for the applicable non-lighting classes.

$KWH_{n\ (class)}$ = The actual kWh electric sales for the Kansas jurisdiction for the applicable time period (n) for the applicable class.

TERM:

This EE Rider shall remain in effect until such time as the Commission-approved amount is recovered. In the event that the Commission rules on Docket No. 08-GIMX-441-GIV, or similar proceeding concerning demand side management cost recovery, or a law is passed regarding treatment of such expenses, then KCPL shall have the right to file for Commission approval of a compliant recovery methodology to replace or revise this EE Rider. KCPL shall have the right to continue recovery under this EE Rider until such time as a replacement methodology is approved and implemented or all Commission-approved amounts are recovered.

NOTES TO THE TARIFF:

1. The references to Accounts within the EE tariff are as defined in the FERC uniform system of accounts.
2. The EEC factor will be expressed in dollars per kilowatt-hour ($/kWh) rounded to five decimal places.
3. All DSM costs incurred through December 31, 2016, and unrecovered under the EE Rider as of January 1, 2017, will be recovered through the Company's Kansas Demand-Side Investment Mechanism (DSIM) Rider beginning July 1, 2017 as an addition to the amounts for KEEIA Cycle 1 to be recovered thereunder.
4. EE Factors for inclusion under the DSIM Rider beginning July 1, 2017 will be determined in conjunction with the semi-annual DSIM Rider filing for that period.

~~**EE FACTORS FOR JULY 1, 2015 THROUGH JUNE 30, 2016 USAGE:**~~

~~Residential Service~~	~~$0.00000/kWh~~
~~Small General Service~~	~~$0.00000/kWh~~
~~Medium General Service~~	~~$0.00000/kWh~~
~~Large General Service~~	~~$0.00000/kWh~~

Issued: ~~March 31, 2015~~April 6, 2016
Month Day Year

Effective: ~~July 1, 2015~~January 1, 2017
Month Day Year

By: ~~Mary Turner~~/s/ Darrin R. Ives ~~Director~~Vice President
Title

RESIDENTIAL TIME OF DAY SERVICE (FROZEN)
Schedule RTOD **(Continued)**

MINIMUM:

Minimum Monthly Bill:
(i) $20.00 per customer; plus
(ii) Any additional charges for line extensions, if applicable.

WINTER SEASON:

Eight consecutive months, spanning the period October 1 of one year to May 31 of the next year.

SUMMER SEASON:

Four consecutive months, spanning the period June 1 to September 30 each year.

SUMMER ON-PEAK AND OFF-PEAK PERIODS:

On-peak hours are defined to be the hours between 1 p.m. and 7 p.m., Monday through Friday, excluding week-day holidays during the Summer Season. Off-Peak hours are defined to be all other hours during the Summer Season. Week-day holidays are Independence Day and Labor Day.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (DSIM~~EER~~)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

SMALL GENERAL SERVICE
Schedule SGS **(Continued)**

DETERMINATION OF HOURS USE:

Total Hours Use in the Summer Season shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. Total Hours Use in the Winter Season shall be determined by dividing the total monthly kWh on all meters (excluding separately metered space heat kWh) by the Monthly Maximum Demand (excluding separately metered space heat kW) in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand (excluding separately metered space heat kW in the Winter Season) by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~ Demand-Side Investment Mechanism Rider (~~EER~~DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

Issued: ~~September 10, 2015~~April 6, 2016
Month Day Year

Effective: ~~October 1, 2015~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

MEDIUM GENERAL SERVICE
Schedule MGS **(Continued)**

DETERMINATION OF DEMANDS (Continued):

BILLING DEMAND:

Billing Demand shall be equal to the higher of: (a) the Monthly Maximum Demand in the current month or (b) the Minimum Demand.

DETERMINATION OF HOURS USE:

Total Hours Use in the Summer Season shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. Total Hours Use in the Winter Season shall be determined by dividing the total monthly kWh on all meters (excluding separately metered space heat kWh) by the Monthly Maximum Demand (excluding separately metered space heat kW) in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand (excluding separately metered space heat kW in the Winter Season) by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (~~EER~~DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

Issued: ~~September 10, 2015~~April 6, 2016
Month Day Year

Effective: ~~October 1, 2015~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

LARGE GENERAL SERVICE
Schedule LGS **(Continued)**

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

For substation voltage customers metered at primary or secondary voltage level, the metered demand and energy shall be increased by 1.20% (metered at primary voltage) or 3.56% (metered at secondary voltage), or alternatively, compensation metering may be installed.

For transmission voltage customers metered at substation, primary, or secondary voltage level, the metered demand and energy shall be increased by 0.90% (metered at substation voltage), 2.11% (metered at primary voltage), or 4.50% (metered at secondary voltage), or alternatively, compensation metering may be installed.

SERVICE AT TRANSMISSION VOLTAGE:

When a customer receives service at transmission voltage through a lease arrangement (or another type of arrangement where financial responsibility is assumed), then additional applicable terms and conditions shall be covered in the lease agreement (or financial responsibility arrangement).

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (~~EER~~DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

SMALL GENERAL SERVICE – SPACE HEATING
Schedule SGA **(Continued)**

DETERMINATION OF DEMANDS:

Demand will be determined by demand instruments or, at the Company's option, by demand tests.

MONTHLY MAXIMUM DEMAND:
The Monthly Maximum Demand is defined as the highest demand indicated in any 30-minute interval during the month on all meters.

FACILITIES DEMAND:

Facilities Demand shall be equal to the highest Monthly Maximum Demand occurring in the last twelve (12) months including the current month.

DETERMINATION OF HOURS USE:

Total Hours Use shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (~~EER~~DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

MEDIUM GENERAL SERVICE – SPACE HEATING
Schedule MGA **(Continued)**

DETERMINATION OF HOURS USE:

Total Hours Use shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (DSIM~~EER~~)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

Issued: ~~September 10, 2015~~April 6, 2016
Month Day Year

Effective: ~~October 1, 2015~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

LARGE GENERAL SERVICE – SPACE HEATING
Schedule LGA **(Continued)**

DETERMINATION OF HOURS USE:

Total Hours Use shall be determined by dividing the total monthly kWh on all meters by the Monthly Maximum Demand in the current month. The kWh associated with a given number of Hours Use is computed by multiplying the Monthly Maximum Demand by that number of Hours Use.

METERING AT DIFFERENT VOLTAGES:

The Company may, at its option, install metering equipment on the secondary side of a Primary Voltage Customer's transformer. In that event, the customer's metered demand and energy shall be increased either by the installation of compensation metering equipment, or by 2.34% if metering equipment is not compensated.

The Company may also, at its option, install metering equipment on the primary side of the transformer for a Secondary Voltage Customer. In this case, the customer's metered demand and energy shall be decreased by 2.29%, or alternatively, compensation metering may be installed.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- ~~Energy Efficiency Rider~~Demand-Side Investment Mechanism Rider (DSIM~~EER~~)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission.

Issued: ~~September 10, 2015~~April 6, 2016
Month Day Year

Effective: ~~October 1, 2015~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Reserved for Future Use

~~**DEMAND RESPONSE INCENTIVE RIDER**~~

~~**Schedule DR**~~

~~**PURPOSE:**~~

~~This voluntary rider is intended to help defer future generation capacity additions and provide for improvements in energy supply.~~

~~**AVAILABILITY:**~~

~~This Rider is available to any Customer currently receiving or requesting service under any generally available non-residential rate schedule. The Customer must have load curtailment capability of at least 25 kW during the Curtailment Season within designated Curtailment Hours and must agree to establish Firm Power Levels as set forth herein. Availability is further subject to the economic and technical feasibility of the installation of required Company equipment. The Company reserves the right to limit the total Curtailable Load determined under this Rider. The Company also reserves the right to modify or terminate the Program at any time subject to Commission approval.~~

~~**NEED FOR CURTAILMENT:**~~

~~Curtailments can be requested for operational or economic reasons. Operational curtailments may occur when physical operating parameters approach becoming a constraint on the generation, transmission, or distribution systems or to maintain the Company's capacity margin requirement. Economic reasons may include any occasion when the marginal cost to produce or procure energy or the opportunity to sell the energy in the wholesale market is greater than the Customer's retail price.~~

~~**AGGREGATION OF A CUSTOMER'S MULTIPLE ACCOUNTS:**~~

~~For the purposes of this Rider only, and at the Company's option, a Customer with multiple accounts may request that some or all of its accounts be aggregated with respect to Estimated Peak Demands, Curtailable Loads and Firm Power Levels, so long as each account in the aggregation is able to provide a Curtailable Load of at least 25 kW.~~

~~The aggregated account will be treated as a single account for purposes of calculating the Program Participation Payments, Curtailment Occurrence Payments and Penalties.~~

~~**TERM OF CONTRACT:**~~

~~Contracts under this Rider shall be for a one-year, three-year, or five-year term. Thereafter, Customers may enter into a new contract for a term of one year, three years, or five years subject to the terms and conditions of this Rider as may be modified from time to time. The Company reserves the right to limit the contract term. Written notice by either the Customer or Company to terminate a contract must be given at least thirty (30) days prior to commencement of the Curtailment Season.~~

~~**CURTAILMENT SEASON:**~~

~~The Curtailment Season shall be June 1 through September 30. The Curtailment Season will exclude Independence Day, Labor Day, or the days celebrated as such.~~

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 76

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 76 Sheet 2

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~May 27, 2011~~October 23, 2014

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 2 of 6 Sheets

Reserved for Future Use

~~**DEMAND RESPONSE INCENTIVE RIDER**~~

~~**Schedule DR**~~ ~~**(Continued)**~~

~~**CURTAILMENT HOURS:**~~

~~Curtailment will occur during the hours of 12:00 noon through 10:00 pm, Monday through Friday, during the Curtailment Season. The Curtailment Hours associated with a Curtailment Event will be established at the time of the Curtailment Notification.~~

~~**CURTAILMENT NOTIFICATION:**~~

~~Customers will receive Curtailment Notification a minimum of four hours prior to the start time of a Curtailment Event.~~

~~**CURTAILMENT LIMITS:**~~

~~The Customer shall specify in the contract, the Maximum Number of Curtailment Events for which the Customer agrees to curtail each Curtailment Season. The Maximum Number of Curtailment Events shall not exceed ten (10) separate occurrences per year. Each occurrence shall be no less than two hours and no more than eight hours per day and no more than one occurrence will be required per day. The Company may call a Curtailment Event no more than three consecutive days per calendar week. The cumulative Curtailment Hours per Customer shall not exceed eighty (80) hours in any calendar year.~~

~~**ESTIMATED PEAK DEMANDS:**~~

~~The Estimated Peak Demand is the average of the Customer's Monthly Maximum Demand for Monday through Friday between 12:00 noon and 10:00 pm for June through September of the previous year.~~

~~The Company may use such other data or methodology as may be appropriate to establish the Estimated Peak Demand or to otherwise measure the Customer's curtailment performance.~~

~~**ESTIMATED PEAK DEMAND MODIFICATIONS:**~~

~~The Company may review and, if necessary, adjust the Customer's Estimated Peak Demand based on evidence that the Customer's actual peak demand has changed, or will change, significantly from the Estimated Peak Demand currently being used to calculate Curtailable Load. If a change in the Customer's Estimated Peak Demand results in a change in their Curtailable Load, the Customer shall lose and/or repay their curtailment payments proportional to the number of days curtailment was not available and the change in the Curtailable Load.~~

~~**FIRM POWER LEVELS:**~~

~~During the months of June through September, the Customer's Firm Power Level, which is the maximum demand level to be drawn during a Curtailment Event, shall be set at least 25 kW less than the Customer's Estimated Peak Demand.~~

~~The Company may use a Test Curtailment to establish the Firm Power Levels for the Customer.~~

Issued: ~~July 18, 2013~~April 6, 2016
Month Day Year

Effective: ~~October 23, 2014~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives ~~Sr. Director~~Vice President
Title

Reserved for Future Use

~~**DEMAND RESPONSE INCENTIVE RIDER**~~

~~**Schedule DR**~~ ~~**(Continued)**~~

~~**FIRM POWER LEVEL MODIFICATION:**~~

~~After the Curtailment Season and upon ninety (90) days written notice by the Customer, the Firm Power Level may be modified to reflect significant change in Customer load, subject to verification and approval by the Company. Any adjusted Firm Power Level shall continue to provide for a minimum Curtailable Load of 25 kW. At any time the Company may adjust the Customer's Firm Power Level downward based on evidence that the Customer's actual demand has dropped, or will drop, significantly from the Estimated Peak Demand. Any change in Firm Power Level that decreases Curtailable Load for the Customer shall result in re-evaluation of all curtailment compensation to the Customer including any payment or credits made in advance of the Curtailment Season. The Customer shall repay the Company prior payments/credits made in excess of the curtailment compensation due based upon the decreased level of Curtailable Load.~~

~~**CURTAILABLE LOAD:**~~

~~Curtailable Load shall be that portion of a Customer's Estimated Peak Demand that the Customer is willing and able to commit for curtailment and the Company agrees to accept for curtailment. The Curtailable Load shall be the same amount for each month of the contract. Under no circumstances shall the Curtailable Load be less than 25 kW. Curtailable Load is calculated as the difference between the Estimated Peak Demand as determined above, and the Firm Power Level.~~

Reserved for Future Use

~~**DEMAND RESPONSE INCENTIVE RIDER**~~
~~**Schedule DR**~~ ~~**(Continued)**~~

~~**CUSTOMER COMPENSATION:**~~

~~Customer compensation shall be defined within each Customer contract and will be based on contract term, Maximum Number of Curtailment Events and the number of actual curtailment occurrences per season. Timing of all payments/credits shall be specified in the contract with each Customer. Payments shall be paid to the Customer in the form of a check or bill credit as specified in the contract. The credits shall be applied before any applicable taxes. All other billing, operational, and related provisions of other applicable rate schedules shall remain in effect.~~

~~Compensation will include:~~

~~INTIAL PAYMENT: A Customer, upon agreement with the Company, may receive a one-time payment to purchase specific equipment necessary to participate in the MPOWER Rider. The amount of any Initial Payment will be deducted from the Program Participation Payment on a net present value (NPV) basis calculated by the Company and in no case will the Initial Payment amount exceed the Program Participation Payment amount. The Initial Payment amount will not be greater than a level which would result in an annual Program Participation Payment of less than $2.50 per kilowatt of Curtailable Load per Curtailment Event.~~

~~PROGRAM PARTICIPATION PAYMENT: For each Curtailment Season, Customer shall receive a payment/credit of a minimum of:~~

- ~~One-year contract: $2.50 per kilowatt of Curtailable Load multiplied by the Maximum Number of Curtailment Events. Customers enrolling in their third or fourth consecutive one-year contracts will receive $3.25 per kilowatt of Curtailable Load multiplied by the Maximum Number of Curtailment Events. Customers enrolling in their fifth or greater consecutive one-year contract will receive $4.50 per kilowatt of Curtailable Load multiplied by the Maximum Number of Curtailment Events.~~
- ~~Three-year contract: $3.25 per kilowatt of Curtailable Load multiplied by the Maximum Number of Curtailment Events.~~
- ~~Five-year contract: $4.50 per kilowatt of Curtailable Load multiplied by the Maximum Number of Curtailment Events.~~

~~The Program Participation Payment will be divided by the number of months in the Curtailment Season and applied as bill credits equally for each month of the Curtailment Season.~~

~~CURTAILMENT OCCURRENCE PAYMENT: The Customer will also receive $0.35 per kW of Curtailable Load for each Curtailment Hour during which the Customer's metered demand is less than or equal to his Firm Power Level during a Curtailment Event.~~

~~Payments for Additional Voluntary Events could be an amount other than $0.35 per kW and will be determined in advance of each Additional Voluntary Event.~~

Reserved for Future Use

~~**DEMAND RESPONSE INCENTIVE RIDER**~~

~~**Schedule DR**~~ ~~**(Continued)**~~

~~**PENALTIES:**~~

~~Failure of the Customer to effect load reduction to its Firm Power Level or lower in response to any Company request for curtailment shall result in the following reduction in, or refund of, Program Participation Payments and Curtailment Occurrence Payments for each such failure as outlined below:~~

~~Curtailment Occurrence Payment reduction: Customer will forfeit Curtailment Occurrence Payment for every hour during which it fails to effect load reduction to its Firm Power Level or lower.~~

~~Program Participation Payment reduction: Customer will receive reduced future Program Participation Payments or a bill debit, in an amount equal to 150% of the Program Participation Payment divided by the Maximum Number of Curtailment Events, the result of which is multiplied by the percentage by which the customer underperformed during a curtailment occurrence.~~

~~Any Customer who fails to reduce load to its Firm Power Level on three or more days within any Curtailment Season may be ineligible for this Rider for a period of two years from the date of the third failure.~~

~~**CURTAILMENT CANCELLATION:**~~

~~The Company reserves the right to cancel a scheduled curtailment prior to the start time of such curtailment. However, if cancellation occurs with less than two hours of the notification period remaining prior to commencement of a curtailment occurrence, the canceled curtailment shall be counted as a separate occurrence with a zero-hour duration.~~

~~**TEST CURTAILMENT:**~~

~~The Company reserves the right to request a test Curtailment once each year and/or within three months after a failure to effect load reduction to its Firm Power Level or lower with any request for curtailment. Test Curtailments do not count toward the Maximum Number of Curtailment Events. Customers will not be compensated for Test Curtailments.~~

THE STATE CORPORATION COMMISSION OF KANSAS

SCHEDULE 76

KANSAS CITY POWER & LIGHT COMPANY
(Name of Issuing Utility)

Replacing Schedule 76 Sheet 6

Rate Areas No. 2 & 4
(Territory to which schedule is applicable)

which was filed ~~May 27, 2011~~October 23, 2014

No supplement or separate understanding shall modify the tariff as shown hereon.

Sheet 6 of 6 Sheets

Reserved for Future Use

~~**DEMAND RESPONSE INCENTIVE RIDER**~~

~~**Schedule DR**~~ ~~**(Continued)**~~

~~**ADDITIONAL VOLUNTARY EVENTS**~~

~~At any time while the Customer's contract is in effect, the Company may request a Customer to participate, on a voluntary basis, in additional Curtailment Events. Customers who are asked and who participate in these additional voluntary curtailments will receive Curtailment Occurrence Payments as outlined previously in this Rider, but will not receive additional Program Participation Payments. This provision applies to all Customers whose contracts are still in force, whether or not they have participated in a number of events equal to their chosen Maximum Number of Events.~~

~~**PROGRAM FUNDING:**~~

~~The Company will provide for customer compensation, marketing costs, evaluation cost, and Program administrative and delivery costs. This Program and its costs shall be eligible for recovery under the Company's Energy Efficiency Rider, Schedule EE, subject to the provisions thereof.~~

~~**EVALUATION:**~~

~~Evaluation, measurement and verification of the Program will be completed consistent with requirements established by the Commission in Docket No. 08-GIMX-442-GIV and Docket No. 10-GIMX-013-GIV.~~

Issued: ~~July 18, 2013~~April 6, 2016
Month Day Year

Effective: ~~October 23, 2014~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives ~~Sr. Director~~Vice President
Title

Real-Time Pricing (FROZEN)
Schedule RTP **(continued)**

BILLING AND ADMINISTRATIVE CHARGE:

A billing and administrative charge of $45 per month is required to cover costs associated with the program.

COMMUNICATIONS CHARGE:

A communications charge of $115 per month is required to cover costs associated with the program. This charge will be waived if the Customer supplies Company-approved communications software. In addition, the Customer will provide access for the phone connection and will be responsible for supplying the phone line between the personal computer and the Company's metering equipment.

COMPANY-SUPPLIED COMPUTER CHARGE:

At the Customer's option, a KCPL standard notebook personal computer with a modem for receiving RTP prices using pre-loaded communications software, can be supplied by the Company. The Customer will pay the cost of the Company-supplied computer, which will be calculated based on the current monthly cost of a Company-standard computer. The Company-supplied computer may be used for other applications, as the Customer desires. However, the Customer will be responsible for any damages to the computer hardware or communications software resulting from such action.

Alternatively, the Customer may supply the computer, which must have minimum performance specifications as required by KCPL. In this case, there will be no computer charge.

REACTIVE DEMAND ADJUSTMENT:

Reactive demand associated both with the CBL and with incremental RTP load will be billed in accordance with the Customer's otherwise applicable, standard (non-RTP) rate schedule. The Customer's Standard Bill does not include any reactive demand charges paid by the Customer for the historical usage period.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

~~**TAX ADJUSTMENT:**~~

- ~~Tax Adjustment Schedule TA shall be applicable to all Customer billings under this schedule.~~

REGULATION:

Subject to Rules and Regulations filed with the Kansas Corporation Commission.

Real-Time Pricing (FROZEN)
Schedule RTP-Plus (continued)

BILLING AND ADMINISTRATIVE CHARGE:

A billing and administrative charge of $45 per month is required to cover costs associated with the program.

COMMUNICATIONS CHARGE:

A communications charge of $115 per month is required to cover costs associated with the program. This charge will be waived if the Customer supplies Company-approved communications software. In addition, the Customer will provide access for the phone connection and will be responsible for supplying the phone line between the personal computer and the Company's metering equipment.

COMPANY-SUPPLIED COMPUTER CHARGE:

At the Customer's option, a KCPL standard notebook personal computer with a modem for receiving RTP prices using pre-loaded communications software, can be supplied by the Company. The Customer will pay the cost of the Company-supplied computer, which will be calculated based on the current monthly cost of a Company-standard computer. The Company-supplied computer may be used for other applications, as the Customer desires. However, the Customer will be responsible for any damages to the computer hardware or communications software resulting from such action.

Alternatively, the Customer may supply the computer, which must have minimum performance specifications as required by KCPL. In this case, there will be no computer charge.

REACTIVE DEMAND ADJUSTMENT:

Reactive demand associated both with the CBL and with incremental RTP-Plus load will be billed in accordance with the Customer's otherwise applicable, standard (non-RTP-Plus) rate schedule. The Customer's Standard Bill does not include any reactive demand charges paid by the Customer for the historical usage period.

ADJUSTMENTS AND SURCHARGES:

The rates hereunder are subject to adjustment as provided in the following schedules:

- Energy Cost Adjustment (ECA)
- Demand-Side Investment Mechanism Rider (DSIM)
- Property Tax Surcharge (PTS)
- Tax Adjustment (TA)
- Transmission Delivery Charge (TDC)

~~**TAX ADJUSTMENT:**~~

~~Tax Adjustment Schedule TA shall be applicable to all Customer billings under this schedule.~~

REGULATIONS:

Subject to Rules and Regulations filed with the State Regulatory Commission

Issued: ~~September 10, 2015~~April 6, 2016
Month Day Year

Effective: ~~October 1, 2015~~January 1, 2017
Month Day Year

By: /s/ Darrin R. Ives Vice President
Title

Witness Details

Brian File, Senior Manager, Products & Services – Kansas City Power & Light Company

Brian's area of responsibility includes managing the development and delivery execution of the Company's demand-side management programs.

Brian earned a Bachelor of Science in Chemical Engineering from the University of Kansas. From 2001 to 2007, Brian worked in the petrochemical industry with Chevron Phillips Chemical Company in marketing and technical field sales roles. He joined KCP&L in 2007 as a Product Manager in the Energy Solutions group. He has since held increasing roles of responsibility at KCP&L including as an Energy Consultant working with the Company's largest healthcare and industrial customers and then manager of that group. Brian also led the Company's Economic Development efforts from 2011 to 2013 as the group continued to highlight benefits of the region to new and existing job creating companies. Brian has held his current position as Sr. Manager since August 2013.

Mark Foltz, Senior Project Director – Kansas City Power & Light Company

Mark has responsibility for the accounting, reporting and analysis of the Company's demand-side management programs.

Mark received a Bachelor of Science in Business Administration with a major in accounting and a Master of Arts in Accountancy from the University of Missouri-Columbia. Mark is a Certified Public Accountant. He was employed with Arthur Andersen & Company in Kansas City, Missouri, from 1981 through 1987 with assignments primarily in the regulated industries practice. Mark was employed with Mark VII, Inc., a publicly-held long-haul, truckload carrier and logistics company headquartered in St. Joseph, Missouri from 1987 through 1995 leaving as Assistant Vice President of Finance. He was employed as Vice President of Finance and Corporate Secretary with TransFinancial Holdings, Inc., a publicly-held company headquartered in Lenexa, Kansas with ownership of a regional, less-than-truckload carrier and insurance premium finance company from 1995 through 2000. In 2000, Mark joined Aquila, Inc. as Manager of External Reporting and Corporate Accounting and progressed to the role of Vice President and Controller at the time of the merger with Great Plains Energy Incorporated in July 2008. Subsequent to the merger, Mark served as an Assistant Controller for KCP&L through August 2009 and is currently Senior Project Director. Mark is a member of the American Institute of Certified Public Accountants and holds the designation as a Certified Global Management Accountant. He has substantial experience in accounting, external reporting, employee benefit plan accounting and administration, and income tax compliance.

Darrin Ives, Vice President, Regulatory Affairs – Kansas City Power & Light Company

Darrin's responsibilities include oversight of the Company's Regulatory Affairs Department, as well as all aspects of regulatory activities including cost of service, rate design, revenue requirements, regulatory reporting and tariff administration.

Darrin graduated from Kansas State University in 1992 with a Bachelor of Science in Business Administration with majors in Accounting and Marketing. He received a Master of Business Administration degree from the University of Missouri-Kansas City in 2001. Darrin is a Certified Public Accountant. From 1992 to 1996, he performed audit services for the public accounting firm Coopers & Lybrand L.L.P. Darrin was first employed by KCP&L in 1996 and held positions of progressive responsibility in Accounting Services and was named Assistant Controller in 2007. He served as

Assistant Controller until he was named Senior Director – Regulatory Affairs in April 2011. Darrin has held his current position as Vice President – Regulatory Affairs since August 2013.

Tim Nelson, Manager, Market Intelligence, Energy Solutions – Kansas City Power & Light Company

Tim oversees the reporting of the energy and demand savings for the demand-side management programs, including the calculation of Net Shared Benefits and Throughput Disincentive-Net Shared Benefits. Tim supervises the Evaluation, Measurement, and Verification (EM&V) process, the conducting of demand-side management (DSM) potential studies, and the maintenance of the Technical Resource Manual (TRM). Finally, Tim manages the preparation of the energy and demand DSM forecast as used for load forecasting and corporate budgeting.

Tim graduated from Iowa State University with a Bachelor of Science in Mechanical Engineering. Tim completed his Master of Science in Finance from the University of Missouri – Kansas City. Tim began his career in 1994 as an Applications Engineer at the Donald Corporation. In late 1994, Tim joined St. Joseph Light & Power as a Production Engineer at the Lake Road Power Plant. In 2001, St. Joseph Light & Power Company was acquired by Aquila, Inc. (formerly UtiliCorp United Inc.). At Aquila, Tim transitioned to Senior Electric Systems Analyst where he was responsible for developing and running production cost fuel and purchase power models, and for preparing the fuel and purchase power budgets. Subsequent to the acquisition of Aquila by Great Plains Energy Incorporated in 2008, Tim held various positions at KCP&L, moving to his current position in 2015.

Mary Turner, Director, Regulatory Affairs – Kansas City Power & Light Company

Mary's responsibilities include leadership and oversight of the Company's regulatory activities before the State Corporation Commission of Kansas.

Mary graduated from Pennsylvania State University with a Bachelor of Science degree in Mineral Economics. She began her career at KCP&L in 1982 as a Fuel Resources & Mining Analyst in the Fuels Department. Over the next several years, she held positions of increasing responsibility within the Fuels Department, becoming Manager of the Fuels Department in 1995. Mary moved to her current position of Director, Regulatory Affairs in January 2006.

Kim Winslow, Director, Energy Solutions – Kansas City Power & Light Company

Kim's responsibilities include providing leadership and direction to the Customer Solutions, Regulated Products and Services, Economic Development, Business Center and Market Intelligence teams. Her responsibilities include initiating and bringing to market new regulated products, as well as improvements and innovations to existing affordability, energy efficiency and demand response products and services, and improving the overall customer experience for KCP&L's business customers.

Kim graduated from Missouri University of Science and Technology with a Bachelor of Science degree in Mechanical Engineering and from Rockhurst University with a Master of Business Administration. Kim began her career at Black & Veatch in 1990 as an equipment engineer in its Gas, Oil and Chemicals Division. Within a year, she transferred to Black & Veatch's Management Consulting Division. As a project manager and consultant she worked on various projects for electric, gas, water and wastewater municipal and investor-owned utilities.

In December 2007, Kim began her employment with KCP&L as a Senior Energy Consultant and held various positions until assuming the position of Director of Energy Solutions in 2013. Kim is a Professional Engineer in the State of Missouri.

Variances Requested

As discussed in the Report, the Commission has had several dockets dealing with demand-side programs and related policy. As a result there are a number of orders that address demand-side management (DSM) policy and implementation requirements. Additionally, experience and changes in Kansas administrative policy have led to conflict with Commission policies regarding contracting for evaluation of demand-side programs.[1] KCP&L has reviewed both the KEEIA and existing Commission orders and, where no conflict exists between the Commission's policy and the new statute, KCP&L's proposal either complies with the Commission's requirements or requests a variance in conjunction with this KEEIA Cycle 1 filing. Each requested variance is discussed below.

A. BUDGET RELATED VARIANCES

(1) In Docket No. 08-GIMX-441-GIV ("08-441 Docket"), the Commission required applications to include a five-year budget. KCP&L is requesting a variance on this requirement allowing it to provide a three-year budget with this application rather than a five-year budget. This variance is necessary because KCP&L is only asking for Commission approval for a three-year program cycle.

K.S.A. 66-1283 addresses budgets for demand-side programs only in section (c)(1)(D)[2] which states,

> Programs targeted to low-income customers or general education campaigns do not need to meet a cost-effectiveness test, so long as the commission determines that the program or campaign is in the public interest and is supported by a reasonable budget in the context of the overall budget.

The Commission addressed DSM program budgets in the 08-441 Docket.[3] The Commission provided a list of items to be submitted with applications for DSM programs, referred to in the 08-441 Order as Appendix A.[4] One of the items listed in Appendix A, *Content of Energy Efficiency Program Application*, Item 4, requires a five-year budget for each requested program including Start-up costs, Administrative Costs, Incentives (if any), Marketing Costs and Evaluation Costs. As KCP&L is requesting only a three-year cycle for the requested portfolio of DSM programs in this Application, we are requesting a variance of the five-year budget requirement that would allow the Company to submit the three-year program budget provided in the Application. The three-year time frame will

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[1] See Docket No. 14-KCPE-074-GIE, Joint Motion to Suspend Third-Party Evaluation, Measurement, and Verification Process Requirements for Kansas City Power & Light's Demand-Side Management Programs and Close Docket, pp. 3-4, ¶¶ 8-9, filed Oct. 31, 2013, and *Order Granting Joint Motion to Suspend Third-Party Evaluation, Measurement, and Verification Program for KCP&L'S DSM Programs and Closing Docket*, issued Nov. 21, 2013.

[2] K.S.A. 66-1283(f)(6) requires utilities to submit an annual report to the commission which includes a comparison of the authorized program budget to the actual costs, but it does not contain any substantive budget provisions.

[3] *In the Matter of a General Investigation Regarding Cost Recovery and Incentives for Energy Efficiency Programs,* Order issued November 14, 2008 ("08-441 Order").

[4] 08-441 Order, p. 12, ¶34 and Appendix A, Content of Energy Efficiency Program Application.

provide sufficient time for the Company, Staff and the Advisory Group to evaluate the program portfolio. If KCP&L determines to extend the demand-side programs beyond this original Cycle 1 three-year (2017-2019) request, KCP&L will file a new application with the Commission, including a new budget.

(2) In Docket No. 08-GIMX-442-GIV ("08-442 Docket"), the Commission allowed the utility the flexibility to adjust a program's budget up to 10% of the program's existing budget without seeking Commission approval. KCP&L is requesting a variance that would allow it to apply the 10% budget flexibility on a portfolio basis rather than on a program-by-program basis. That is, filing for Commission approval of budget overages would only be necessary if the Company expected to exceed 10% of the Commission-approved three-year overall portfolio budget rather than the current policy requiring a filing when the Company expects to exceed the Commission-approved three-year budget of an individual program.

The Commission addressed demand-side program budget flexibility in the 08-442 Docket, stating,

> 181. The Commission believes granting a utility flexibility to adjust a program's budget up to 10%, based on the program's initial budget (or subsequent budget approved by the Commission in a two-year review or other proceeding) is appropriate as it should permit utilities to more quickly adjust to changing circumstances. Utilities should submit a report to Staff, the Commission, and other parties involved in the initial program approval or formal program review, if one has occurred, detailing why the deviation was made, providing up to date analysis of participation, and explaining how the change will be beneficial to customers.
>
> 182. However, the Commission does not find budget changes in excess of 10% should be permitted outside of the normal filing and review process. The Commission believes utility cost-tracking procedures should be sufficient to enable a utility to request budget modifications greater than 10% before the situation becomes an issue. The Commission recognizes time may be of importance, as indicated by the utilities in their comments, and will attempt to expedite the review process if requested by a utility.[5]

KCP&L is requesting a variance from the first sentence of paragraph 181 of the Commission's 08-442 Order only to the extent it applies on a program-by-program basis. KCP&L requests that the flexibility to adjust the budget apply to the entire portfolio of programs in total. This variance would indirectly impact the requirements of paragraph 182 in that the requirement to seek Commission approval for budget deviations greater than 10% would be applied on a total portfolio basis rather than on a program basis. Such flexibility will allow the Company to better manage actual program participation including such actions as reallocation of the marketing budget, as necessary, to focus on programs that may require additional marketing to gain participation and/or achieve targets, or use of the allowed budget flexibility to address variances in actual implementation costs from budget.

[5] 08-442 Docket, *Order Following Collaborative on Benefit-Cost Testing and Evaluation, Measurement, and Verification,* issued Apr. 13, 2009 ("08-442 Order"), p. 54, ¶s 181, 182.

B. EM&V RELATED VARIANCES/WAIVERS

To the extent necessary, KCP&L requests a variance/waiver of any existing EM&V requirements so as to allow the Company:

(1) to conduct EM&V in accordance with the EM&V plan and schedule outlined in Appendix C, EM&V Plan and Timeline, using an independent contractor hired by KCP&L with KCC Staff approval, with a Commission hired EM&V auditor to review the results;

(2) to provide reporting to the Commission in accordance with the KEEIA interim reports on KCP&L's demand-side programs on an annual basis consistent with KEEIA rather than on a semi-annual basis;

(3) to file an EM&V report with the Commission twice during the three-year KEEIA program cycle, or every 18 months, in accordance with the timeline set out in Appendix C; and

(4) to use KCP&L's developed Technical Reference Manual to determine deemed savings, which relies on EM&V results from GMO Cycle 1[6], the Company's potential study and secondary sources, such as the Illinois TRM, rather than using only the California Manual.

The Commission addressed Evaluation, Measurement & Verification (EM&V) in several dockets including:

Docket No. 07-GIMX-247-GIV, *In the Matter of a General Investigation Regarding Energy Efficiency Programs.*

Docket No. 08-GIMX-442-GIV, *In the Matter of a General Investigation Regarding Benefit-Cost Analysis and Program Evaluation for Energy Efficiency Programs* (08-442 Docket).

Docket No. 10-GIMX-013-GIV, *In the Matter of the General Investigation Regarding Development of an RFP for a Third-Party Provider or Providers of Energy Efficiency Program Evaluation, Measurement, & Verification Services.*

Docket No. 14-KCPE-042-TAR, *In the Matter of the Application of Kansas City Power & Light Company for Approval to Extend Its Demand-Side Management Programs.*

Docket No. 14-KCPE-074-GIE, *In the Matter of a Proceeding for Evaluation, Measurement, and Verification of Kansas City Power & Light Company's Energy Efficiency Programs.*

As a result of these dockets, the Commission has issued several orders that address how EM&V should be conducted for purposes of demand-side programs in Kansas. In summary, the Commission orders, in total, require the KCC Staff to issue a Request-for-Proposal (RFP) for a third party EM&V consultant to perform an independent EM&V study on a utility's DSM programs after the first two years following implementation of the programs, with results to be issued six months after the initial two-year program period. The orders also require use of the Database for Energy Efficiency Resources (DEER) values for benefit/cost (B/C) analysis until the first EM&V is completed, at which

[6] At the time of the development of the TRM, the GMO EM&V MPSC approved report was only available for Program Year 1.

point alternative values may be suggested; inclusion of avoided costs of future CO_2 regulations within the SCT at rates of $10/ton, $25/ton and $40/ton; and a myriad of other very specific guidance on exactly what information is to be used for B/C calculations set years ago.

KCP&L has gained a wealth of experience over the past 10 years regarding DSM programs and has used that experience in developing this filing, including its EM&V plan and timeline recommendation set out in Appendix C, its proposed TRM, and its cost-effectiveness test calculations. To the extent KCP&L has deviated from any of the prior Commission orders regarding these items, KCP&L requests the Commission grant a variance.

The KEEIA, K.S.A. 66-1283, speaks to EM&V in several paragraphs as follows:

> Section (c)(1)(D): In making its decision whether or not to approve the proposed program, the commission shall determine the appropriate test for evaluating the cost-effectiveness of the demand-side program. Programs targeted to low-income customers or general education campaigns do not need to meet a cost-effectiveness test, so long as the commission determines that the program or campaign is in the public interest and is supported by a reasonable budget in the context of the overall budget.
>
> Section (c)(2): The Commission shall allow recovery of the reasonable and prudent costs associated with delivering commission approved demand-side programs, so long as the program: (A) Results in energy or demand savings; and (B) is beneficial to customers in the customer class for which the programs were implemented, whether or not the program is utilized by all customers in such class. The fact that a commission-approved program proves not to be cost-effective is not by itself sufficient grounds for disallowing cost recovery. Programs determined to be non-cost-effective, other than programs targeted to low-income customers or general education campaigns, shall be modified to address deficiencies or terminated following such determination.
>
> Section (e)(3): [To achieve the goals of this act, the commission shall:] provide timely earnings opportunities for public utilities associated with cost-effective, measurable and verifiable demand-side savings;
>
> Section (e)(5): [To achieve the goals of this act, the commission shall:] provide independent evaluation of demand-side programs, as deemed necessary by the commission;
>
> Section (f): On or before May 31 of each year, each public utility shall submit an annual report to the commission describing the results of such demand-side programs for the previous calendar year. The report shall include:
>
> 1. Program expenditures, including incentive payments;
> 2. peak demand and energy savings impacts and the techniques used to estimate such impacts;
> 3. avoided costs and the techniques used to estimate such costs;
> 4. the estimated cost-effectiveness of the demand-side programs;
> 5. the net economic benefits of the demand-side programs; and
> 6. a comparison of the commission authorized program budget to actual costs.

The Company strives to provide useful, impactful and cost-effective programs. Ongoing analysis of program performance through Evaluation, Measurement & Verification (EM&V) is an important aspect to that end. Approximately, but not more than five percent (5%) of the three-year KEEIA Cycle 1 (2017-2019) program portfolio budget will be spent for EM&V. The Company will work with the Advisory Group (as requested in Appendix C) to develop an evaluation plan to determine how best to allocate and utilize the EM&V budget. As stated above, to the extent a variance or waiver of an existing Commission policy or requirement is necessary to allow KCP&L to handle EM&V in accordance with the terms of the KEEIA proposal in this docket, such variance or waiver is hereby requested.

C. OTHER REQUESTS

(1) Labor Costs

The Commission did not address incremental labor costs necessary to implement KEEIA Cycle 1 demand-side programs in its initial orders in the 08-441 and 08-442 Dockets. However, in a subsequent Commission order regarding KCP&L's Energy Efficiency (EE) Rider,[7] the Commission approved a Staff supported change in KCP&L's EE Rider to move recovery of certain associated labor costs out of the EE Rider and into the Company's general rate cases.[8] Specifically, the Commission approved Staff's recommendation to,

> limit the inclusion of internal labor expenses in energy efficiency cost recovery riders to employees whose sole job function is energy efficiency related activities, and whose salary, (or someone they replaced), was not included in base rates during the Utility's last base rate proceeding.[9]

Since that time, the Company has not included any labor costs in its EE Rider. The Company now estimates that it will need an additional 4.5 full-time employees (FTEs) in order to implement the KEEIA Cycle 1 demand-side programs. The job functions of these employees will be solely related to energy efficiency activities and their salaries are not currently in KCP&L's base rates. However, KCP&L recently received approval for demand-side programs in its KCP&L Missouri and KCP&L Greater Missouri Operations (GMO) service territories and some of these new employees are now in place to implement those programs. Employees assigned to implementation of demand-side programs will work for all three KCP&L jurisdictions and their time will be allocated among the jurisdictions accordingly. Because the sole job functions of these new employees are DSM related, they did not replace a former employee, and their salaries are not in KCP&L's base rates, KCP&L does not believe a variance is needed. However, because of the timing between implementation of the MEEIA and the KEEIA, if the Commission believes some variance request is necessary, KCP&L hereby requests such variance to allow inclusion of these demand-side portfolio related labor costs in its DSIM Rider.

(2) General Request for Additional Variance or Waiver

KCP&L has attempted to identify any existing Commission rule, regulation, order, policy or other requirement that may be inconsistent with KCP&L's KEEIA Application and to request a variance or waiver of the same. To the extent any additional waiver or variance is needed to allow approval of the terms of KCP&L's KEEIA proposal, KCP&L hereby requests such waiver or variance.

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[7] Docket No. 10-KCPE-636-TAR, *Order Approving Energy Efficiency Rider,* issued Jun. 21, 2010 ("10-636 Order").

[8] 10-636 Order.

[9] 10-636 Order, p. 3, ¶10.

APPENDIX H
CONTAINS CONFIDENTIAL INFORMATION NOT AVAILABLE TO THE PUBLIC
ORIGINAL FILED UNDER SEAL

KEEIA Cycle 1 Earnings Opportunity Matrix							
Metric	**Target**	**Target Unit**	**$/unit**	**Unit**	**EO Target**	**As % of Total EO**	**EO Cap**
HER launch and continuance of program over the 36-month KEEIA Cycle 1 period.		N/A		N/A	**$425,000**	5.00%	$425,000
IE Weatherization and IEMF launch and continuance of program over 36-month KEEIA Cycle 1 period.		N/A		N/A	**$170,000**	2.00%	$170,000
EE & DR MWh (excluding HER, IE Weatherization, and IEMF): criteria will be first-year cumulative incremental MWh.	71,940.190	MWh	$21.27	$/MWh	**$1,530,000**	18.00%	$1,989,000
EE & DR MW (excluding HER, IE Weatherization, IEMF, and DRI): criteria will be first-year cumulative incremental MW coincident with system peak.	33.233	MW	$166,250.41	$/MW	**$5,525,000**	65.00%	$8,287,500
DRI MW: criteria will be savings achieved in year 3.	15.032	MW	$56,546	$/MW	**$850,000**	10.00%	$1,105,000
Total Earnings Opportunity					**$8,500,000**	100.00%	$11,976,500
Note: Targets based on Cumulative Savings at the meter							

Earnings opportunity will be recovered upon approval of Final EM&V results

KCP&L-KS

Energy Loadshape

% of Energy by Month

COMPOSITE FOR PROGRAMS	Home Lighting Rebate	Home Appliance Recycling Rebate	Home Energy Report	Online Home Energy Audit	Whole House Efficiency	Income-Eligible Multi-Family	Income-Eligible Weatherization	Residential Programmable Thermostat	Business Energy Efficiency Rebate - Prescriptive	Business Energy Efficiency Rebate - Custom	Strategic Energy Management	Block Bidding	Online Business Energy Audit	Small Business Direct Install	Business Programmable Thermostat	Demand Response Incentive	Residential Portfolio	Business Portfolio	Total Portfolio
January	10.2%	8.3%	6.7%	0.0%	6.8%	9.3%	9.0%	0.0%	8.3%	8.6%	8.6%	8.6%	0.0%	8.6%	0.0%	0.0%	8.0%	8.5%	8.4%
February	9.2%	7.5%	6.0%	0.0%	6.1%	8.3%	8.0%	0.0%	7.5%	7.8%	7.7%	7.7%	0.0%	7.8%	0.0%	0.0%	7.1%	7.7%	7.6%
March	8.7%	8.2%	7.8%	0.0%	7.1%	8.5%	8.5%	0.0%	8.5%	8.7%	8.6%	8.6%	0.0%	8.6%	0.0%	0.0%	7.8%	8.6%	8.5%
April	8.4%	8.0%	7.6%	0.0%	6.6%	8.3%	8.2%	0.0%	8.1%	8.1%	8.2%	8.2%	0.0%	8.2%	0.0%	0.0%	7.5%	8.1%	8.0%
May	8.7%	8.3%	8.0%	0.0%	7.7%	8.5%	8.4%	5.7%	8.6%	8.6%	8.6%	8.6%	0.0%	8.6%	5.7%	0.0%	8.1%	8.6%	8.5%
June	6.8%	8.6%	10.3%	0.0%	11.1%	7.7%	8.1%	20.0%	8.6%	8.3%	8.2%	8.2%	0.0%	8.2%	20.0%	0.0%	9.4%	8.4%	8.5%
July	7.1%	8.9%	10.6%	0.0%	14.1%	8.0%	8.3%	30.3%	9.0%	8.4%	8.5%	8.5%	0.0%	8.5%	30.3%	0.0%	10.7%	8.6%	8.9%
August	7.1%	8.8%	10.5%	0.0%	12.3%	8.0%	8.3%	28.3%	9.1%	8.7%	8.6%	8.6%	0.0%	8.6%	28.3%	0.0%	10.0%	8.8%	9.0%
September	7.3%	8.6%	9.8%	0.0%	7.8%	7.8%	7.9%	14.6%	8.2%	7.9%	8.1%	8.1%	0.0%	8.0%	14.6%	0.0%	8.1%	8.0%	8.1%
October	8.4%	8.4%	8.2%	0.0%	7.0%	8.3%	8.3%	1.2%	8.3%	8.7%	8.6%	8.6%	0.0%	8.6%	1.2%	0.0%	7.8%	8.6%	8.4%
November	8.1%	8.1%	7.9%	0.0%	6.6%	8.0%	8.0%	0.0%	7.9%	8.1%	8.2%	8.2%	0.0%	8.1%	0.0%	0.0%	7.5%	8.1%	8.0%
December	10.2%	8.4%	6.6%	0.0%	6.8%	9.2%	8.9%	0.0%	7.9%	8.1%	8.2%	8.2%	0.0%	8.1%	0.0%	0.0%	7.9%	8.1%	8.0%

Demand Loadshape

% of Peak System Demand Impact During System Peak Hour of Each Month

COMPOSITE FOR PROGRAMS	Home Lighting Rebate	Home Appliance Recycling Rebate	Home Energy Report	Online Home Energy Audit	Whole House Efficiency	Income-Eligible Multi-Family	Income-Eligible Weatherization	Residential Programmable Thermostat	Business Energy Efficiency Rebate - Prescriptive	Business Energy Efficiency Rebate - Custom	Strategic Energy Management	Block Bidding	Online Business Energy Audit	Small Business Direct Install	Business Programmable Thermostat	Demand Response Incentive	Residential Portfolio	Business Portfolio	Total Portfolio
January	100.0%	100.0%	25.1%	0.0%	55.2%	100.0%	100.0%	0.0%	82.3%	95.2%	86.3%	86.3%	0.0%	85.4%	0.0%	0.0%	100.0%	89.1%	90.8%
February	89.4%	70.4%	69.8%	0.0%	75.1%	100.0%	100.0%	0.0%	91.6%	100.0%	100.0%	100.0%	0.0%	96.9%	0.0%	0.0%	78.3%	97.9%	94.9%
March	79.7%	73.5%	71.9%	0.0%	76.0%	100.0%	100.0%	0.0%	91.3%	100.0%	100.0%	100.0%	0.0%	96.9%	0.0%	0.0%	77.5%	97.7%	94.7%
April	100.0%	96.7%	76.5%	0.0%	61.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	79.2%	100.0%	100.0%
May	100.0%	97.2%	81.7%	0.0%	63.3%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	81.3%	100.0%	100.0%
June	81.3%	100.0%	100.0%	0.0%	99.2%	100.0%	100.0%	0.0%	100.0%	99.9%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	98.9%	100.0%	100.0%
July	81.3%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.8%	99.8%	0.0%	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%
August	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
September	81.3%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	0.0%	73.0%	61.3%	73.7%	73.7%	0.0%	65.8%	0.0%	0.0%	100.0%	67.2%	73.7%
October	100.0%	99.2%	84.2%	0.0%	61.1%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	80.1%	100.0%	100.0%
November	100.0%	100.0%	65.9%	0.0%	64.9%	100.0%	100.0%	0.0%	81.3%	95.1%	86.3%	86.3%	0.0%	85.4%	0.0%	0.0%	94.4%	88.7%	89.5%
December	100.0%	100.0%	11.8%	0.0%	48.0%	100.0%	100.0%	0.0%	57.3%	45.5%	67.8%	67.8%	0.0%	55.4%	0.0%	0.0%	94.1%	53.2%	59.3%

KCP&L energizing life

1200 Main Street
Kansas City, MO 64105

Home Energy Report

Account number:
Report period: 09/24/15–11/23/15

This report gives you context on your energy use to help you make smart energy saving decisions.

For a full list of energy saving products and services for purchase, including rebates from Kansas City Power and Light, visit **kcpl.com/reports**.

If you have questions or no longer want to receive reports, call (855) 856-5109.

Last 2 Months Neighbor Comparison

You used **28% more** electricity than your efficient neighbors.

* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

How you're doing:

Great

GOOD

More than average

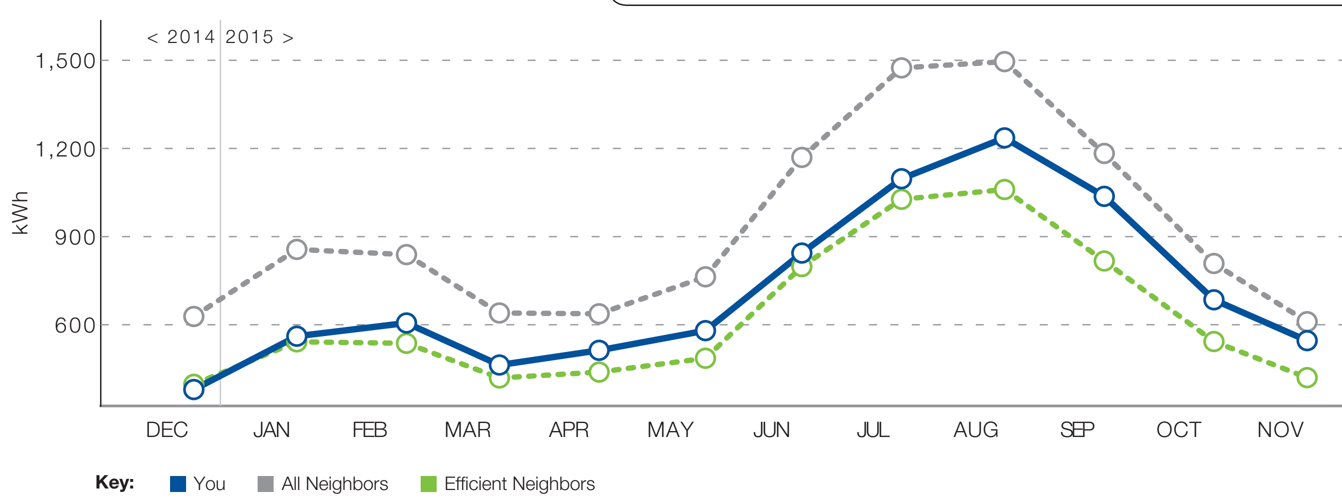
Who are your Neighbors?

All Neighbors: Approximately 100 occupied, nearby homes (avg 0.11 mi away)

Efficient Neighbors: The most efficient 20 percent from the "All Neighbors" group

Last 12 Months Neighbor Comparison

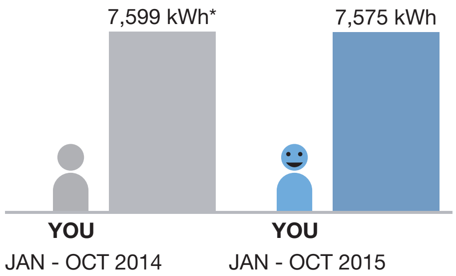
You used **14% more** electricity than your efficient neighbors. This costs you about **$119 extra** per year.



Turn over for savings →

Personal Comparison

How you're doing compared to last year:



* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

So far this year, you used **about the same** amount of electricity as last year.

Looking for ways to save? Visit **kcpl.com/reports**

Personalized tips | For a complete list of energy saving investments and smart purchases, visit **kcpl.com/reports**.

Quick Fix
Something you can do right now

☐ **Reduce your water heater's temperature**
Lowering your water heater's temperature from 140°F to 120°F can reduce water heating costs by up to 10%. This temperature will also help prevent scalding.

Check the owner's manual for safety instructions before making any changes to your water heater's settings.

After lowering the temperature on the water heater, use a thermometer to check the temperature of water flowing from your faucets.

SAVE UP TO
$25 PER YEAR

Smart Purchase
An affordable way to save more

☐ **Install efficient showerheads**
Showering accounts for about 40% of your hot water use, but you can cut costs without sacrificing comfort.

If your shower fills a gallon bucket in less than 20 seconds, you could save with an efficient showerhead. These showerheads, with flow rates no greater than two gallons per minute, help reduce hot water use while maintaining water pressure.

You can realize significant savings with efficient showerheads, especially if you have a large household.

SAVE UP TO
$50 PER YEAR

Great Investment
A big idea for long-term savings

☐ **Learn more from a home power monitor**
Power use monitors track your home's electricity use and display real-time feedback onto a device in your home.

These monitors can calculate your daily electricity bills and show you how your behaviors affect your costs. You'll see how energy-saving behaviors translate to lower bills. This information could help motivate you and your family to save.

For more advanced meters, installation by an electrician is recommended.

SAVE UP TO
$60 PER YEAR

KCP&L energizing life

runs on OPOWER®

1200 Main Street
Kansas City, MO 64105

0014837 0023-C10-I -P14851 -730905

***********AUTO**5-DIGIT 12345

BOB SMITH
1234 MAIN STREET
KANSAS CITY, MO 12345

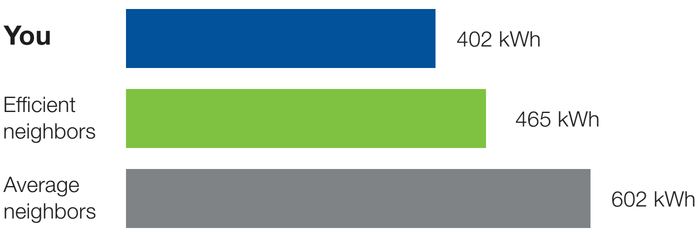
Home Energy Report

May 20, 2015
Account number 123456789

We've put together this report to help you understand your energy use and what you can do to save.

Find a list of rebates and energy-saving products and services you can buy.
www.kcpl.com/reports

Here's how you compare to your neighbors



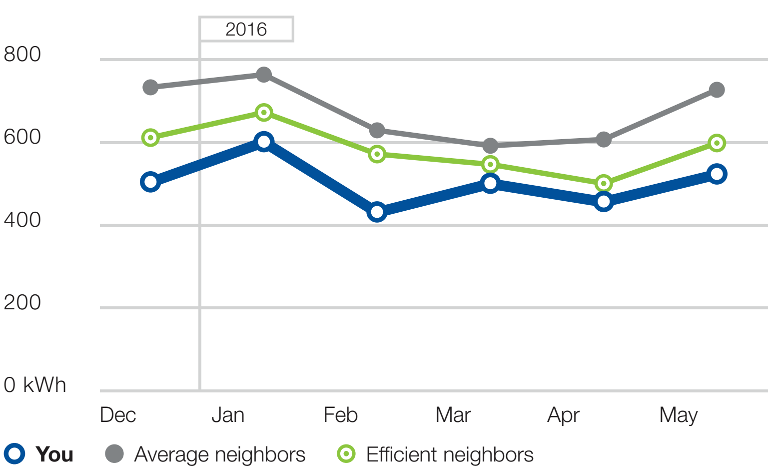
Apr 21, 2015 - May 20, 2015

This is based on 87 similar homes within approx. 4 miles. Efficient neighbors are the 20% who use the least amount of electricity.
See back for details.

Great
Good
Using more than average

14% less electricity
than efficient neighbors

Neighbor comparison over time



Over the last 6 months, you used less than your efficient neighbors.
$58 saved

Tips from efficient neighbors

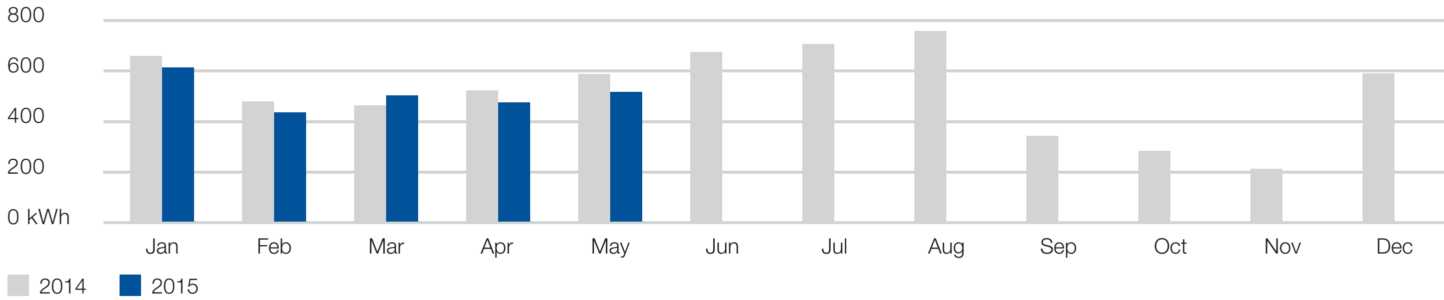
Unplug electronics when they're not in use
Save up to $75 per year

Replace your inefficient light bulbs
Save up to $30 over the bulb life

Turn over

Track your progress

So far this year, you used 6% less than last year.



Save on your next bill

Buy ENERGY STAR® appliances and electronics

The U.S. Department of Energy tests the efficiency of household appliances and electronics. The best earn the ENERGY STAR label. This program saves American households millions of dollars every year.

The ENERGY STAR label can be found on efficient models of many products. Certified models often run more quietly, last longer, and are more convenient to use than conventional models. Visit www.energystar.gov for details.

Save up to $30 per year

Frequently asked questions

What's a kWh?
A kilowatt hour (kWh) is a way to measure electricity use. A 100-watt lightbulb uses 1 kWh every 10 hours.

How is my comparison calculated?
Your electricity use is compared to homes with a similar size, building type, and heating system. You can view your home information at **www.kcpl.com/homeprofile.**

Why is my utility sending me this report?
When customers save energy, we get closer to meeting our state energy efficiency goals. It's good for everyone.

How do I stop receiving reports?
Call 1-855-444-7591.

We're here to help

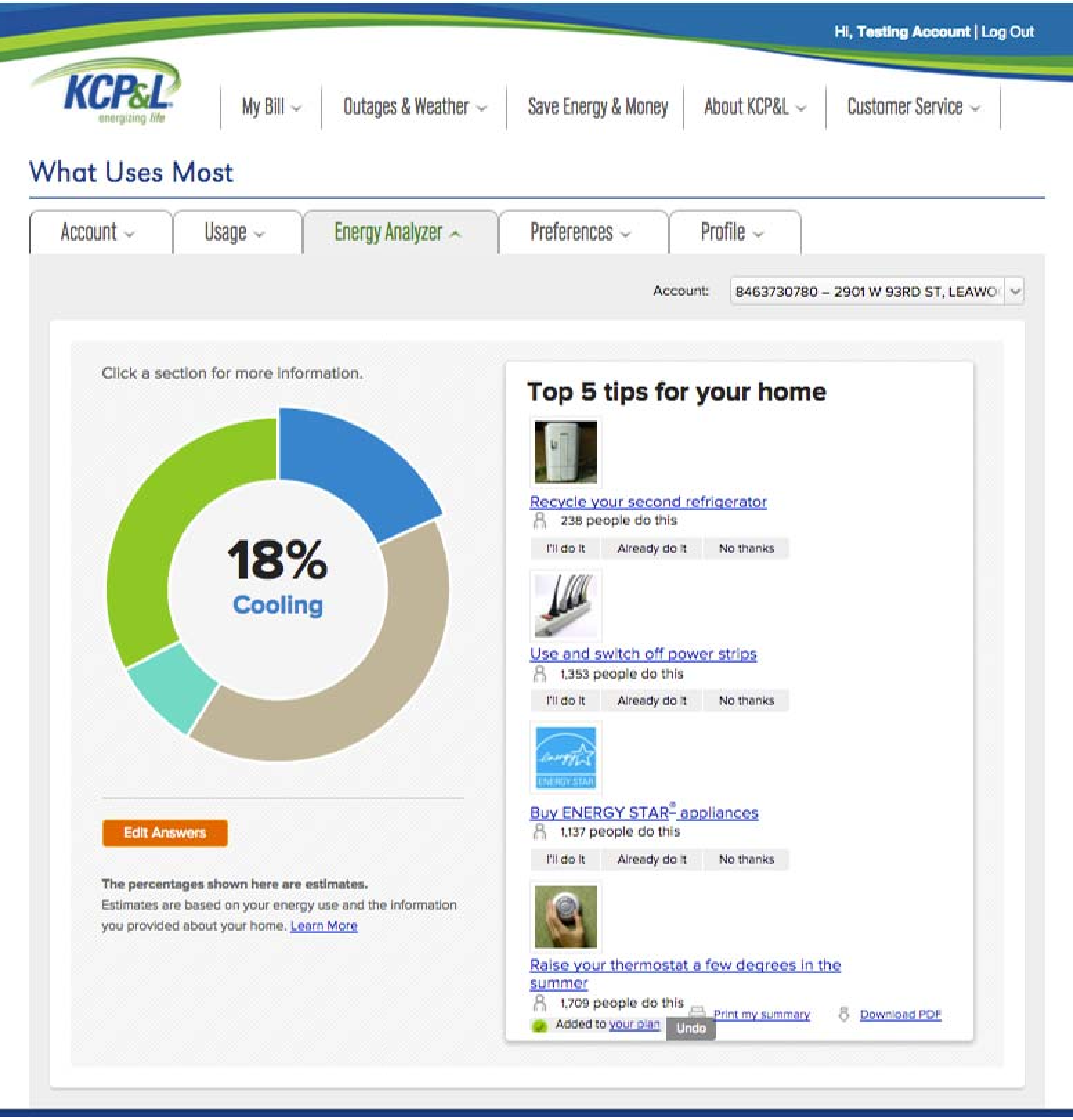
- **www.kcpl.com/reports**
- **reports@utilityco.com**
- **1-855-444-7591**

Find more energy saving purchases

- **www.kcpl.com/reports**

KCP&L energizing life

♻ Printed on 10% post-consumer recycled paper using water-based inks.


Hi, Testing Account | Log Out
KCP&L
energizing life
My Bill
Outages & Weather
Save Energy & Money
About KCP&L
Customer Service
What Uses Most
Account
Usage
Energy Analyzer
Preferences
Profile
Account:
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Click a section for more information.
18%
Cooling
Edit Answers
The percentages shown here are estimates.
Estimates are based on your energy use and the information you provided about your home. Learn More
Top 5 tips for your home
Recycle your second refrigerator
238 people do this
I'll do it
Already do it
No thanks
Use and switch off power strips
1,353 people do this
I'll do it
Already do it
No thanks
Buy ENERGY STAR® appliances
1,137 people do this
I'll do it
Already do it
No thanks
Raise your thermostat a few degrees in the summer
1,709 people do this
Added to your plan
Undo
Print my summary
Download PDF

APPENDIX | L

Potential Study

As noted in the Potential Study - Appendices A, C1, C2, K and L will be provided on a CD/DVD due to the voluminous nature.

"**[redacted]**" Designates "Highly Confidential" Information
Has Been Removed
Pursuant To 4 CSR 240-2.135.

NAVIGANT

Demand-Side Resource Potential Study Report

Prepared for:
Kansas City Power and Light

KCP&L energizing life

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August 2013

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ES Executive Summary

ES.1. Introduction and Background

Kansas City Power and Light (KCP&L) and KCP&L Greater Missouri Operations (KCP&L GMO), referred to herein as the "Companies," selected Navigant to conduct a Demand Side Management ("DSM") Resource Potential Study in January, 2012. The Study objective was to assess the potential for energy and peak demand savings from energy efficiency, combined heat and power, and demand response in the residential, commercial, and industrial sectors from 2014 to 2033.

This report summarizes the methodology and results for the energy-efficiency (EE) and combined heat and power (CHP) portion of the study. Details regarding the demand response (DR) portion of this study are provided in a separate report entitled "Demand-Side Resource Potential Study Report – Demand Response," dated August 2013. However, we provide aggregate potential results for the combination of EE, CHP, and DR in this document for ease of reference. As required per the statement of work, this study is deemed to be in compliance with Missouri protocols, as outlined in Missouri Public Service Commission (4 CSR 240)[1], for conducting a demand side resource potential study. For comparison with the results of this study, the targets for cumulative energy and demand savings in 4 CSR 240.094 are provided below. Comparisons, however, are subject to the caveats offered in Section ES-4. As a result, we provide this table once in the report as opposed to providing "side by side" comparisons of potential versus the targets below.

Table ES-1. Cumulative Energy and Demand Savings Targets per MO 4 CSR 240.094

Year	Energy (% of Baseline)	Demand (% of Baseline)
2012	0.30%	1.00%
2013	0.80%	2.00%
2014	1.50%	3.00%
2015	2.40%	4.00%
2016	3.50%	5.00%
2017	4.80%	6.00%
2018	6.30%	7.00%
2019	8.00%	8.00%
2020	9.90%	9.00%
beyond 2021	+1.9%/year	+1.0%/year

[1] Rules of Department of Economic Development Division 240—Public Service Commission Chapter 22—Electric Utility Resource Planning (4 CSR 240-22.010) – http://sos.mo.gov/adrules/csr/current/4csr/4c240-22.pdf

ES.2. Approach

This section provides a high-level summary of the approach detailed in section 2 of this report.

Baseline Market Characterization and Historical Load Analysis:
Navigant conducted extensive primary data collection as part of this study. We collected detailed measure-level detail and building characteristics from 208 buildings (69 residential and 139 commercial & industrial). Additionally, we conducted SIC code analysis of the Companies' databases to permit historical load analysis and to allow segmenting our model into 11 commercial, 7 industrial, and 4 residential customer segments. These data were used to forecast building stock by customer segment, to estimate market penetration of efficient measures, and to develop measure-level savings estimates specific to the Companies. These data, in combination with the measure characterization of the next task, were also used to estimate the forecast energy breakdown by end use category.

Measure Identification and Characterization:
Navigant identified nearly 500 possible measures to consider as part of this study and ultimately characterized 298 of the measures considered most likely to contribute to savings. Input from the baseline market characterization task was used to develop measure-level savings estimates and initial technology "densities" (e.g., measures/home for residential, or measures/1000 square feet for C&I). Navigant used a number of techniques to estimate measure-level savings, including calibrated building simulation and standard engineering algorithms. Navigant also estimated measure costs, accounting for regional cost differences using standard adjustment techniques (e.g., RSMeans City Cost Indices). Of the 298 measures characterized, 192 of the measures passed the TRC test and contributed to Economic potential.

Estimation of Technical, Economic, Realistic and Maximum Achievable Potential for Energy Efficiency Measures:
Navigant estimated the technical, economic, realistic achievable (RAP), and maximum achievable potential (MAP) for energy and peak demand savings for this study using its proprietary Demand Side Management Simulator (DSMSim™) model. DSMSim is a bottom-up technology diffusion and stock tracking model implemented using a System Dynamics[2] framework. As part of this analysis, Navigant developed payback acceptance curves specific to the Companies using online and telephone surveys of residential and C&I customers. Navigant also developed a suite of 20 EE, DR, and CHP programs and allocated savings potential to each program, resulting in a program forecast that is consistent with the RAP scenario. Navigant estimated administrative costs at the program level and calculated total program and portfolio costs and cost-effectiveness. Additionally, Navigant developed traditional EE supply curves and also ran scenario analysis between the RAP and MAP to understand how increasing savings targets would likely increase total costs.

Estimation of Combined Heat and Power Potential:
In addition to estimating EE potential, Navigant estimated the potential energy and peak demand savings from combined heat and power (CHP) measures. Navigant considered a wide range of CHP technologies, fuel types and system sizes (e.g., fuel cells, micro-turbines, reciprocating engines, gas

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[2] See Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill. 2000 for detail on System Dynamics modeling. Also see http://en.wikipedia.org/wiki/System_dynamics for a high-level overview.

turbines, steam turbines), screened them for cost effectiveness, and estimated adoption of CHP technologies using a separate in-house CHP potential spreadsheet model.

Estimation of Demand Response Potential:
Navigant estimated DR potential using its Demand Response Simulator (DRSim™) model, which follows the approach used in the FERC National Assessment of Demand Response Potential[3]. Consistent with the FERC approach, Navigant estimated DR potential for five DR categories, including interruptible/curtailable tariffs, direct load control, pricing without enabling technology, pricing with enabling technology, and "other" DR.

ES.3. Results

This executive summary provides the aggregate energy and peak demand savings results for the realistic achievable potential (RAP) scenario. Results for additional scenarios (e.g., technical, economic, and maximum achievable potential (MAP) scenarios as well as scenarios between RAP and MAP) are detailed in the remainder of this report.

Opt Out Customers – The potential results of this study does not exclude opt-out customers. At the time of this report development, the list of opt-out customers was very much in flux due to changes in customer decision-making regarding opt-out. As such, we collectively agreed with the Companies that we would not reduce the potential results of this study to exclude opt-out customers. However, we note that the latest data available indicated that, for GMO, approximately 19% (on an energy consumption basis) of GMO's large C&I customers were likely to opt out[4]. Data were not available for KCP&L MO and KCP&L KS.

Net-to-Gross Assumptions
Due to the inherent uncertainty in forecasting net-to-gross (NTG) ratios, we agreed with stakeholders to use a NTG value of 1.0 for all measures except appliance recycling (where 0.52 was used). As such, the potential estimates herein are, for the most part, estimates of "gross" savings. Using a default net-to-gross factor of 0.8 rather than 1.0 results in roughly a 20% reduction in savings relative to that shown in this report[5]. Consideration of this caveat is important for comparing the results of this study with future achievements and for setting compliance targets.

Cumulative Realistic Achievable Potential (RAP) for Energy Savings
Cumulative realistic achievable potential energy savings for energy efficiency (EE), combined heat and power (CHP), and demand response (DR) for KCP&L GMO, KCP&L MO, and KCP&L KS are provided below in Table ES-2 through Table ES-4, which illustrate results for the RAP scenario, and which does not exclude opt-out customers. Cumulative realistic achievable potential as a percentage of baseline forecast energy sales at the end of the 20-year forecast horizon ranges from 17.6% to 22.5%, with the largest value in KCP&L GMO's service territory. This difference is primarily attributable to GMO's higher forecast annual growth rate, lending additional opportunities for savings in new buildings. Over a nearer-term time horizon, 10 years, cumulative realistic achievable potential is 14.5% (or 1.45%/year)

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[3] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

[4] kWh for KCP&L-GMO customers exercising the opt-out option. Data taken from MO Public Commission Staff opt-out list provided to the KCP&L-GMO for verification on January 10, 2013.

[5] Most measures still passed the TRC.

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for KCP&L GMO, 13.8% (or 1.38%/year), and 11.8% (or 1.18%/year) for KCP&L KS. As noted in these figures, for DR we conservatively assume there are no significant energy savings, which is consistent with typical industry assumptions for dispatch-able DR programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU.

Table ES-2. Cumulative EE/DR/CHP Energy RAP (MWh) -- KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	90,895	0	0	90,895	1.1%
2015	191,727	0	2,300	194,027	2.2%
2016	302,033	0	4,600	306,633	3.5%
2017	427,785	0	11,501	439,286	4.9%
2018	569,884	0	20,702	590,586	6.5%
2019	722,942	0	32,203	755,146	8.2%
2020	881,328	0	46,169	927,497	9.9%
2021	1,037,947	0	62,271	1,100,218	11.5%
2022	1,187,910	0	79,522	1,267,433	13.1%
2023	1,330,940	0	96,938	1,427,878	14.5%
2024	1,467,700	0	113,040	1,580,739	15.7%
2025	1,599,381	0	126,677	1,726,058	16.9%
2026	1,727,665	0	137,685	1,865,350	17.9%
2027	1,851,215	0	146,065	1,997,280	18.8%
2028	1,973,566	0	151,979	2,125,545	19.6%
2029	2,093,452	0	156,087	2,249,539	20.3%
2030	2,208,148	0	158,716	2,366,863	20.9%
2031	2,321,418	0	160,359	2,481,777	21.5%
2032	2,434,251	0	161,345	2,595,596	22.0%
2033	2,548,082	0	162,002	2,710,084	22.5%

Table ES-3. Cumulative EE/DR/CHP Energy RAP (MWh) -- KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	83,217	0	0	83,217	0.9%
2015	175,255	0	3,162	178,417	2.0%
2016	277,039	0	6,325	283,364	3.2%
2017	392,661	0	15,811	408,472	4.5%
2018	522,323	0	28,461	550,783	6.1%
2019	660,805	0	44,272	705,077	7.7%
2020	801,979	0	63,472	865,450	9.4%
2021	938,370	0	85,608	1,023,978	11.0%
2022	1,064,988	0	109,325	1,174,312	12.5%
2023	1,180,430	0	133,268	1,313,697	13.8%
2024	1,284,982	0	155,404	1,440,386	15.0%
2025	1,379,080	0	174,151	1,553,232	16.0%
2026	1,467,237	0	189,285	1,656,522	16.9%
2027	1,550,686	0	200,805	1,751,491	17.7%
2028	1,629,698	0	208,937	1,838,635	18.3%
2029	1,704,979	0	214,584	1,919,563	18.9%
2030	1,775,261	0	218,198	1,993,459	19.4%
2031	1,843,326	0	220,456	2,063,783	19.8%
2032	1,909,732	0	221,812	2,131,544	20.2%
2033	1,975,390	0	222,715	2,198,106	20.6%

Table ES-4. Cumulative EE/DR/CHP Energy RAP (MWh) -- KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	60,804	0	0	60,804	0.9%
2015	128,797	0	556	129,353	1.9%
2016	201,858	0	1,112	202,970	3.0%
2017	283,429	0	2,780	286,209	4.2%
2018	374,060	0	5,003	379,063	5.5%
2019	470,598	0	7,783	478,381	6.8%
2020	569,032	0	11,158	580,190	8.2%
2021	664,736	0	15,050	679,786	9.5%
2022	754,392	0	19,219	773,611	10.7%
2023	837,423	0	23,428	860,851	11.8%
2024	913,897	0	27,320	941,217	12.7%
2025	983,873	0	30,615	1,014,488	13.5%
2026	1,050,099	0	33,276	1,083,375	14.3%
2027	1,112,106	0	35,301	1,147,407	14.9%
2028	1,171,573	0	36,731	1,208,303	15.5%
2029	1,228,577	0	37,723	1,266,300	16.0%
2030	1,282,500	0	38,359	1,320,858	16.5%
2031	1,335,151	0	38,756	1,373,907	16.9%
2032	1,386,789	0	38,994	1,425,783	17.2%
2033	1,437,728	0	39,153	1,476,880	17.6%

Cumulative Realistic Achievable Potential (RAP) for Peak Demand Savings

Cumulative realistic achievable potential peak demand savings for EE, CHP, and DR for KCP&L GMO, KCP&L MO, and KCP&L KS are provided below in Table ES-5 through Table ES-7, which illustrate results for the RAP scenario. Cumulative realistic achievable potential as a percentage of baseline forecast peak demand at the end of the 20-year forecast horizon ranges from about 24% to 40%, with the largest value in KCP&L GMO's service territory. These percentage differences are driven by the potential for DR, which varies considerably among utilities. DR differences are driven largely by observed differences in the response of large C&I customers (i.e., GMO observes much greater response from large C&I customers in interruptible tariff programs than KS). These assumptions are based on observed results from the Companies' MPower program and are also reasonably consistent with assumptions in the FERC National Assessment of Demand Response Potential[6].

Finally, we note that the EE and DR realistic achievable potential estimates were estimated independently with separate models. If EE and DR programs are simultaneously pursued with adoption as forecast below, there would likely be some interaction between the two, whereby DR potential could be reduced due to aggressive adoption of EE. The estimates below do not adjust for such possible

[6] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

overlap. The extent of this possible reduction in DR realistic achievable potential when combined with an aggressive EE portfolio would depend on a number of factors, including the extent to which the customers participating in EE and DR overlap (as well as the extent to which measures overlap). Though, as an upper bound, one could postulate that the percentage reduction in DR realistic achievable potential when combined with the EE savings achieved below would be roughly 22%, which is the fraction of baseline peak demand accounted for by EE measures alone in the GMO service territory (assuming 100% overlap of EE and DR customers and measures). Such overlap could therefore potentially reduce the combined percentages below (for GMO, for instance), by up to a relative value of 9.4% (or 4 absolute percentage points, from 40% of peak in 2033 to 36%)[7]. In reality, the reduction due to overlap is likely to be lower than this upper bound.

Table ES-5. Cumulative EE/DR/CHP Energy RAP (MW) -- KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	20	36	0.0	56	2.8%
2015	44	66	0.3	110	5.4%
2016	71	98	0.6	169	8.2%
2017	102	130	1.6	233	11.2%
2018	137	162	2.8	302	14.4%
2019	176	195	4.4	375	17.6%
2020	217	229	6.3	452	20.8%
2021	257	262	8.5	527	23.9%
2022	295	296	10.9	602	26.9%
2023	331	330	13.2	674	29.7%
2024	364	365	15.4	745	32.3%
2025	395	375	17.3	787	33.6%
2026	424	384	18.8	827	34.7%
2027	452	394	19.9	866	35.7%
2028	479	404	20.7	904	36.6%
2029	506	415	21.3	942	37.4%
2030	530	425	21.7	977	38.1%
2031	555	435	21.9	1,011	38.7%
2032	579	445	22.0	1,046	39.3%
2033	603	455	22.1	1,080	39.9%

[7] 22.25% of 455 MW of DR is 101 MW, which is ~9.4% of the 1080 MW total forecast in 2033.

Table ES-6. Cumulative EE/DR/CHP Energy RAP (MW) -- KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	19	78	0.0	97	4.9%
2015	41	91	0.4	132	6.7%
2016	65	110	0.9	176	8.9%
2017	94	125	2.2	221	11.1%
2018	127	141	3.9	271	13.5%
2019	162	156	6.0	325	16.1%
2020	198	172	8.7	379	18.6%
2021	233	187	11.7	432	21.1%
2022	266	201	14.9	482	23.4%
2023	295	215	18.2	528	25.5%
2024	320	230	21.2	571	27.4%
2025	343	233	23.8	600	28.5%
2026	364	237	25.8	626	29.5%
2027	382	241	27.4	650	30.3%
2028	400	243	28.5	672	31.0%
2029	416	246	29.3	692	31.6%
2030	432	249	29.8	711	32.2%
2031	447	252	30.1	729	32.6%
2032	461	255	30.3	746	33.1%
2033	475	258	30.4	763	33.5%

Table ES-7. Cumulative EE/DR/CHP Energy RAP (MW) -- KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	14	54	0.0	67	3.9%
2015	30	66	0.1	95	5.4%
2016	47	77	0.2	125	7.0%
2017	67	88	0.4	156	8.7%
2018	90	99	0.7	190	10.5%
2019	115	108	1.1	224	12.4%
2020	140	117	1.5	259	14.1%
2021	165	124	2.1	292	15.7%
2022	189	130	2.6	322	17.2%
2023	210	137	3.2	350	18.5%
2024	229	143	3.7	375	19.7%
2025	246	146	4.2	396	20.5%
2026	262	148	4.5	415	21.3%
2027	276	151	4.8	432	21.9%
2028	289	153	5.0	448	22.4%
2029	302	155	5.1	463	22.9%
2030	314	157	5.2	477	23.2%
2031	326	159	5.3	490	23.6%
2032	337	161	5.3	504	24.0%
2033	348	164	5.3	517	24.3%

Cumulative Maximum Achievable Potential (MAP) for Energy Savings

Cumulative maximum achievable potential energy savings for energy efficiency (EE), combined heat and power (CHP), and demand response (DR) for KCP&L GMO, KCP&L MO, and KCP&L KS are provided below in Table ES-8 through Table ES-10, which do not exclude opt-out customers. Cumulative maximum achievable potential as a percentage of baseline forecast energy sales at the end of the 20-year forecast horizon ranges from 24.5% to 29.2%, with the largest value in KCP&L GMO's service territory. As with RAP, this difference is primarily attributable to GMO's higher forecast annual growth rate, lending additional opportunities for savings in new buildings. Over a nearer-term time horizon, 10 years, cumulative maximum achievable potential is 18.4% (or 1.84%/year) for KCP&L GMO, 18.9% (or 1.89%/year) for KCP&L MO, and 16.2% (or 1.62%/year) for KCP&L KS. As noted in these figures, for DR we conservatively assume there are no significant energy savings, which is consistent with typical industry assumptions for dispatch-able DR programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU. Cumulative MAP for peak demand savings is outlined in Appendix L.

Table ES-8. Cumulative EE/DR/CHP Energy MAP (MWh) – KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	106,150	0	0	106,150	1.2%
2015	227,510	0	3,485	230,995	2.7%
2016	364,356	0	6,970	371,327	4.2%
2017	523,176	0	17,426	540,602	6.1%
2018	703,168	0	31,367	734,535	8.1%
2019	897,225	0	48,793	946,018	10.3%
2020	1,098,957	0	69,953	1,168,909	12.5%
2021	1,298,414	0	94,349	1,392,764	14.6%
2022	1,490,214	0	120,488	1,610,702	16.6%
2023	1,672,037	0	146,876	1,818,913	18.4%
2024	1,847,554	0	171,273	2,018,827	20.1%
2025	2,018,670	0	191,935	2,210,605	21.6%
2026	2,187,097	0	208,614	2,395,711	23.0%
2027	2,350,357	0	221,310	2,571,667	24.2%
2028	2,513,766	0	230,272	2,744,038	25.3%
2029	2,673,904	0	236,495	2,910,400	26.3%
2030	2,826,627	0	240,479	3,067,106	27.1%
2031	2,976,165	0	242,968	3,219,132	27.9%
2032	3,123,259	0	244,462	3,367,721	28.6%
2033	3,270,051	0	245,457	3,515,509	29.2%

Table ES-9. Cumulative EE/DR/CHP Energy MAP (MWh) – KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	103,809	0	0	103,809	1.2%
2015	222,681	0	4,791	227,472	2.6%
2016	358,190	0	9,583	367,772	4.1%
2017	515,413	0	23,957	539,370	6.0%
2018	692,514	0	43,122	735,636	8.1%
2019	881,699	0	67,079	948,778	10.4%
2020	1,075,116	0	96,169	1,171,285	12.7%
2021	1,261,494	0	129,708	1,391,202	14.9%
2022	1,435,067	0	165,643	1,600,710	17.0%
2023	1,591,901	0	201,921	1,793,822	18.9%
2024	1,733,479	0	235,460	1,968,939	20.6%
2025	1,860,562	0	263,866	2,124,428	21.9%
2026	1,980,594	0	286,796	2,267,390	23.2%
2027	2,096,715	0	304,250	2,400,965	24.2%
2028	2,208,109	0	316,571	2,524,680	25.2%
2029	2,315,369	0	325,127	2,640,496	26.0%
2030	2,416,230	0	330,602	2,746,832	26.7%
2031	2,513,709	0	334,025	2,847,734	27.4%
2032	2,607,909	0	336,078	2,943,987	28.0%
2033	2,699,565	0	337,447	3,037,012	28.5%

Table ES-10. Cumulative EE/DR/CHP Energy MAP (MWh) – KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	75,079	0	0	75,079	1.1%
2015	162,511	0	842	163,353	2.4%
2016	260,583	0	1,685	262,267	3.9%
2017	373,070	0	4,212	377,282	5.5%
2018	499,032	0	7,581	506,613	7.3%
2019	633,542	0	11,792	645,334	9.2%
2020	771,503	0	16,906	788,410	11.2%
2021	905,533	0	22,802	928,335	13.0%
2022	1,030,013	0	29,120	1,059,133	14.7%
2023	1,145,041	0	35,497	1,180,539	16.2%
2024	1,250,737	0	41,393	1,292,130	17.5%
2025	1,347,196	0	46,387	1,393,583	18.6%
2026	1,439,352	0	50,418	1,489,770	19.6%
2027	1,526,001	0	53,486	1,579,488	20.5%
2028	1,610,665	0	55,652	1,666,317	21.4%
2029	1,692,504	0	57,157	1,749,660	22.1%
2030	1,770,291	0	58,119	1,828,411	22.8%
2031	1,846,247	0	58,721	1,904,968	23.4%
2032	1,920,151	0	59,082	1,979,233	23.9%
2033	1,992,450	0	59,322	2,051,772	24.5%

ES.4. Caveats and Limitations

Opt Out Customers

At the time of this report, the list of opt-out customers was very much in flux due to changes in customer decision-making regarding opt-out. As such, we collectively agreed with the Companies that we would not reduce the potential results of this study to exclude opt-out customers. However, we note that the latest data available indicated that, for GMO, approximately 19% (on an energy consumption basis) of GMO's large C&I customers were likely to opt out[8]. Data were not available for KCP&L MO and KCP&L KS.

Net-to-Gross Assumptions

Due to the inherent uncertainty in forecasting net-to-gross (NTG) ratios, we agreed with stakeholders to use a NTG value of 1.0 for all measures except appliance recycling (where 0.52 was used). As such, the potential estimates herein are, for the most part, estimates of "gross" savings. Using a default net-to-gross factor of 0.8 rather than 1.0 results in roughly a 20% reduction in savings relative to that shown in this report[9]. Consideration of this caveat is important for comparing the results of this study with future achievements and for setting compliance targets.

Scenario Analysis versus Forecasts/Predictions

Estimation of market potential for energy efficiency savings is inherently uncertain. As such, the estimates provided herein are *scenario* based, and should not be considered to be forecasts or predictions of what *will* happen. Savings that will actually be achieved over the next 10-20 years depend on a large variety of factors, including incentive levels for each measure, effectiveness of program design, execution and marketing efforts, degree of success of emerging technologies, future fuel/electricity prices, measure costs, and economic factors, among many others.

Market Uncertainties

A number of uncertainties exist regarding the market acceptance of energy-efficiency measures. For instance, the primary method employed in this study for calculating equilibrium market share of efficient technologies is use of "payback acceptance curves," which are commonly used in potential studies as a reasonable and tractable approach to estimate market share for dozens or even hundreds of technologies. However, this approach is limited in its ability to account for non-monetary product purchase considerations. When combined with the other market dynamics considered in Navigant's DSMSim model, this approach should provide directionally reasonable estimates. However, it is subject to limitations and uncertainty that would likely be cost-prohibitive to mitigate (e.g., via detailed discrete choice analysis studies for each measure). Additionally, while Navigant's DSMSim model employs advanced technology diffusion theory, diffusion parameters are also uncertain (e.g., marketing effectiveness).

Data Uncertainties

Navigant drew upon many data sources, both primary (e.g., from the baseline study) and secondary (refer to Section 2.2.3), for estimation of measure energy consumption, incremental cost, and market saturation. However, uncertainty in these estimates inevitably exists, which can affect estimates of

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[8] kWh for KCP&L-GMO customers exercising the opt-out option. Data taken from MO Public Commission Staff opt-out list provided to the KCP&L-GMO for verification on January 10, 2013.

[9] Most measures still passed the TRC.

potential. Navigant did not conduct parametric or other uncertainty analysis on the unit-energy-savings, cost estimates, or initial market saturation estimates as part of this study.

1. Introduction

1.1 *Background and Study Goals*

Kansas City Power and Light (KCP&L) and KCP&L Greater Missouri Operations (KCP&L GMO), referred to herein as the "Companies," selected Navigant to conduct a Demand Side Management ("DSM") Resource Potential Study in January, 2012. The Study objective was to assess the various categories of electrical energy efficiency and demand response potential in the residential, commercial, and industrial sectors for the Companies' service areas from 2014 to 2033. Portions of the Study may be used by the Companies to satisfy some of the demand-side analysis requirements of the Missouri Public Service Commission Regulations for Electric Utility Resource Planning ("MO Planning Regulations"). Results of this Study will be used in the Companies' Integrated Resource Planning ("IRP") process to analyze various levels of energy efficiency related savings and peak demand savings attributable to both energy efficiency initiatives and demand response initiatives at various levels of cost in support of the Companies' effort to design highly effective potential demand-side programs that broadly cover the full spectrum of cost-effective end use measures for all customer market segments with the ultimate goal of achieving all cost-effective demand-side savings. As part of this study, Navigant also developed a suite of energy efficiency and demand response programs that were designed to achieve the savings deemed per this study to be "realistically achievable." As required per the statement of work, this study is deemed to be in compliance with Missouri protocols, as outlined in Missouri Public Service Commission (4 CSR 240)[10], for conducting a demand side resource potential study.

1.2 *Stakeholder Involvement*

Navigant involved a broad range of stakeholders throughout the study to ensure opportunity for review and comment of key study assumptions and methods was provided to those where were interested. Navigant invited the following organizations to each meeting and copied each of these stakeholders on correspondence providing key assumption and methodology files. Navigant reviewed and responded to stakeholder comments and distributed final documents to all stakeholders.

Stakeholders:

- KCP&L, KCP&L Greater Missouri Operations
- Missouri Public Service Commission
- Missouri Office of Public Counsel
- Missouri Department of Natural Resources
- National Resources Defense Council
- Empire Electric District
- Renew Missouri
- Ameren

Table 1-1 provides a summary of key stakeholder review meetings and relevant files pertaining to the review process.

[10] Rules of Department of Economic Development Division 240—Public Service Commission Chapter 22—Electric Utility Resource Planning (4 CSR 240-22.010) – http://sos.mo.gov/adrules/csr/current/4csr/4c240-22.pdf

Table 1-1. List of Stakeholder Meetings and Relevant Review and Response Files

Review Item or Milestone	Review Type	Meeting Date (s)	Final File Date(s)	Relevant File Name(s)
Sample Design for On-Site Surveys	Webinar	3/22/2012	3/22/2012	Proposed KCPL Sample Design; Measure List Discussion 012_03_22.ppt
EE Measure List	Webinar	4/3/2012	4/26/2012	KCPL Measure List -- Final.xlsx
C&I Onsite Survey Instruments	File for review	N/A	4/26/2012	KCPL_CI_Onsite_Instrument_FINAL_040612_Clean.docx
Res Onsite Survey Instruments	File for review	N/A	5/25/2012	KCPL Res OnSite Instrument 2012 05 22.docx
Measure Characterization Approach	File for review	N/A	7/17/2012	KCPL Measure Characterization Approaches - 2012_07_17_R2
Online Survey (Payback Acceptance) Sample Design/ Approach	2 Webinars	7/24/2012, 8/13/2012	7/24/2012, 8/9/2012	KCPL Online Telephone Survey Approach 2012_07_24; Navigant notes from KCPL Online, Telephone Survey Approach Webinar, August 7, 2012_R2.docx; Navigant response to July 31 Memorandum Regarding Online, Telephone Surveys, August 9 2012.docx
Online Survey Instruments	File for review	8/28/2012	8/23/2012	CI Survey DRAFT Aug 23 2012 - BVG.docx; Landlord Survey DRAFT Aug 23 2012 - BVG; Residential Survey DRAFT Aug 23 2012 - BVG
Measure Characterization Results	File for review	N/A	9/30/2012	KCPL Measure Characterization Summary - 20130109
DR Measures/ Approach	File for review	N/A	12/3/2012	KCPL_DR Measures-Approach Memo_07-17-12.docx
List of EE and DR Programs	File for review	N/A	12/3/2012	KCPL GMO Final Programs Matrix Dec 3 2012.docx
CHP Measures/ Approach	File for review	N/A	8/1/2012	Proposed KCPL CHP Modeling Approach 2012_08_01.ppt

Review Item or Milestone	Review Type	Meeting Date (s)	Final File Date(s)	Relevant File Name(s)
EE/DR Modeling Approach	Webinar	12/13/2012	12/13/2012, 01/03/2013, 01/14/2013	KCPL EEDR Demand Side Resource Potential Modeling Methodology 2012_12_13_R2.pdf; Response to KCPL and GMO StakeholderComments_2013_January_03 v4.docx; Response to KCPL and GMO StakeholderComments_2013_January_14; Response to KCPL and GMO StakeholderComments_2013_March_5;
DRAFT Report – Review and Comment Period	3 Webinars	4/15/2013, 5/13/2013, 5/15/2013	4/17/2013, 5/22/2013, 5/10/2013, 5/13/2013	EO-2012-0323 MDNR Navigant Potential Study Comments 04 17_Navigant Response.docx; EO-2012-0323 MDNR Navigant Potential Study MDNRComments 05222013_Navigant Response.docx; KCPL potential study NRDC comments_Navigant_Response_2013_05_10.docx; PSC CHP Comments_Navigant Response 05_13_13

1.3 *Organization of Report*

This report is organized as follows:

Section 2 describes the study approach to estimating potential for energy efficiency savings, including discussion of baseline market characterization; measure identification and characterization; approach to modeling technical, economic, realistic achievable and maximum achievable potential; and calculation of payback acceptance curves.

Section 3 offers the results of the potential study analysis for energy efficiency measures, including a summary of aggregate savings potential for each utility; disaggregated savings results by customer segment, end use, and program; discussion of the top measures contributing toward potential; program costs and cost effectiveness; and energy efficiency potential supply curves.

Section 4 discuss the approach, assumptions, and results for Navigant's estimate of the potential for Combined Heat and Power (CHP) savings, as this portion of the study was conducted separately from the efficiency potential analysis.

Section 5 summarizes the combined savings from energy efficiency, CHP, and Demand Response (DR), as the DR study is a stand-alone report delivered to the Companies in parallel with this report.

2. Approach to Electric Energy and Demand Savings

2.1 *Baseline Market Characterization*

This section provides a high-level overview of the data sources and methods used to develop the baseline market characterization. Additional detail regarding the process, including sampling and site surveys used, can be found in Appendix K and Appendix J. The baseline market characterization involved extensive primary data collection from 208 customer sites in Kansas and Missouri. These customer data, combined with SIC code analysis of KCP&L and GMO's customer database, were used to estimate baseline measure characteristics (e.g., savings and initial market shares – see Section 2.2) and the initial breakdown of KCP&L and GMO's historic load by customer segment and by end use.

2.1.1 Breakdown by Customer Segment

The first step in the baseline market characterization was to break down historic energy usage by customer segment by mapping customer SIC codes (provided by KCP&L) to each customer segment. Consistent with MO 4 CSR 240-22.030(4), we segmented the study into the following residential, commercial, and industrial segments.

Residential: Single Family, Single-Family Low Income, Multifamily, Multifamily Low Income

Commercial: Grocery, Healthcare, Lodging, Office-Large, Office-Small, Restaurants, Retail, Schools, Warehouses, Other Commercial

Industrial: Chemicals, Electronics, Food, Rubber-Plastics, Stone-Clay-Glass, Motor Freight Transportation[11], Other Industrial[12]

Table 2-1 and Figure 2-1 provide the calculated breakdown of energy consumption, by customer segment, for the first year of the study (2014).

[11] The original breakdown per MO 4 CSR 240 did not specify a Motor Freight segment. However, SIC code analysis indicated this was a large customer segment. As such, we specifically targeted this segment as part of the onsite sample design and Industrial customer segmentation.

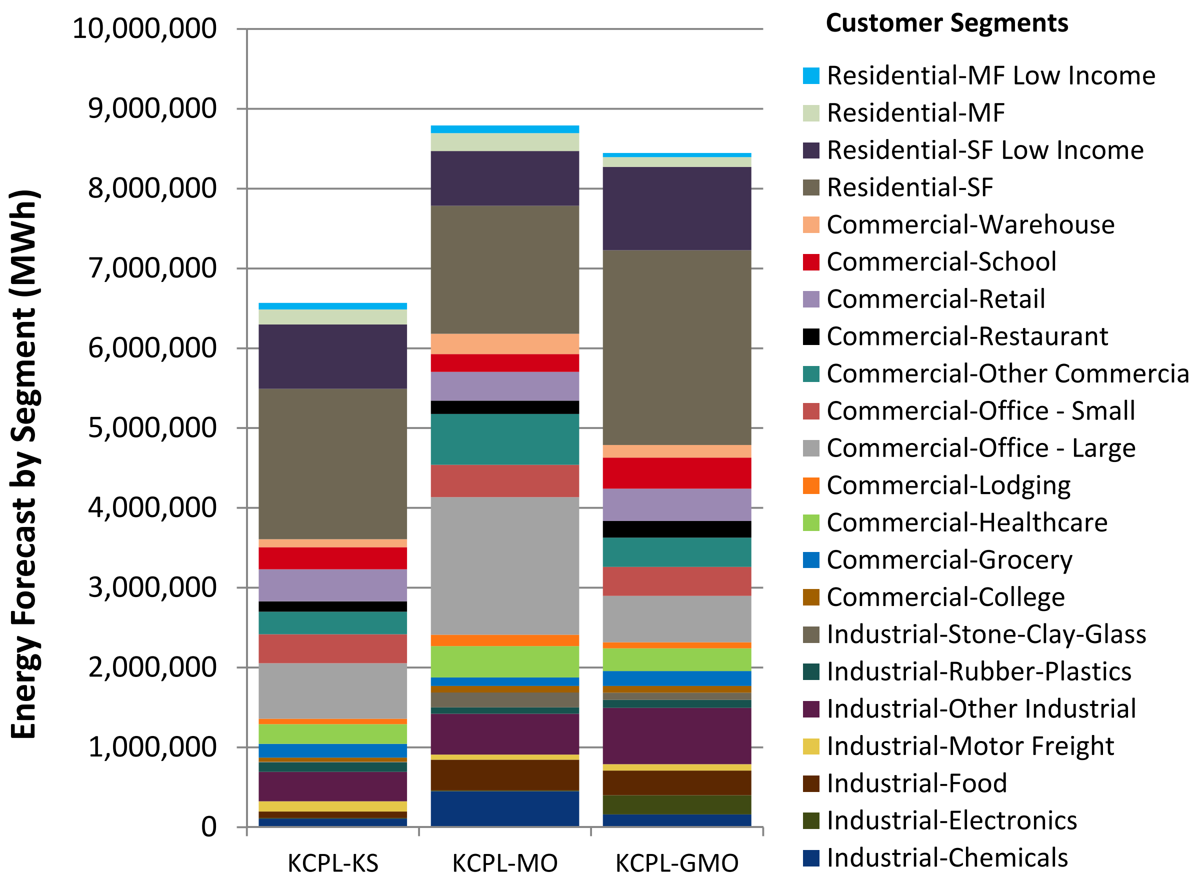
[12] The original breakdown included a number of additional Industrial customer segments. However, our SIC code analysis indicated that these customer segments were a very small percentage of the energy consumption in the KCP&L GMO service territories. If a customer segment fell below a threshold of 1% of energy sales, it was aggregated into the "Other Industrial" customer segment. Though the Agriculture segment was not specifically included in the MO 4 CSR 240 breakdown, stakeholders did express some interest in this segment. After further analyzing this segment, Navigant chose not to specifically include it in the customer segmentation breakdown due to its very small calculated contribution toward total energy consumption (~0.4% of the three utility's combined energy consumption and ~0.75% of combined C&I energy consumption – well below the 1% threshold we applied for purposes of customer segmentation and sample design).

Table 2-1. Forecast Energy Consumption Breakdown (2014), in MWh

	KCPL-KS	KCPL-MO	KCPL-GMO
Industrial-Chemicals	109,750	451,450	161,806
Industrial-Electronics	7,517	10,702	238,731
Industrial-Food	79,681	383,343	308,581
Industrial-Motor Freight	127,791	65,188	80,461
Industrial-Other Industrial	369,841	510,800	705,581
Industrial-Rubber-Plastics	118,770	80,755	101,682
Industrial-Stone-Clay-Glass	7,517	185,834	90,187
Commercial-College	51,868	82,701	82,229
Commercial-Grocery	172,142	106,052	186,563
Commercial-Healthcare	247,313	393,073	284,708
Commercial-Lodging	67,654	142,051	76,924
Commercial-Office - Large	695,332	1,724,071	580,911
Commercial-Office - Small	361,572	403,775	363,401
Commercial-Other Commercial	284,146	638,256	366,053
Commercial-Restaurant	130,046	166,375	209,552
Commercial-Retail	400,661	360,965	404,073
Commercial-School	275,878	221,833	388,158
Commercial-Warehouse	101,481	254,913	159,154
Residential-Single Family	1,882,013	1,602,132	2,438,300
Residential-SF Low Income[13]	806,577	686,628	1,044,986
Residential-Multi-Family	188,799	223,868	122,334
Residential-MF Low Income	80,914	95,943	52,429
Totals	**6,567,261**	**8,790,707**	**8,446,806**

[13] Split by low-income households assumes that 32.2% of households are low-income. Assumptions & Sources (all specific to Kansas City Metro Area): Average HH size = 2.54 people (Census DP02). 2011 Federal poverty threshold for HH with 3 people = $17,916 (Census Poverty Thresholds). 2x federal poverty threshold = $35,832. % of HH with income < $35k = 32.2% (Census S1909).

Figure 2-1. Forecast Energy Consumption Breakdown (2014), in MWh



The above breakdown of energy consumption by customer segment is particularly relevant in this study, as measure potential is estimated by customer segment, with in some cases unique measure-level savings estimates that are dependent on the relevant customer segment. Additionally, the breakdown above is used in conjunction with a calculation of energy intensity by building type (derived from the baseline study's primary data collection activities – see Table 2-2) and a customer count forecast to determine the forecast building stock (in 1000 square feet) for C&I customers. For residential homes, the customer count forecast is used directly and does not require the estimation of energy intensity for forecasting building stock. The forecast building stock is then used in conjunction with measure-level "densities" (see section 2.2.2) to determine the quantity of measures (and the quantity that are "inefficient" and therefore offer savings potential) in each utility service territory.

Table 2-2. Customer Segment Energy Intensity

Customer Segment	kWh/ square foot
Industrial-Chemicals	231.9
Industrial-Electronics	30.4
Industrial-Food	106
Industrial-Motor Freight	7.6
Industrial-Other Industrial	22
Industrial-Rubber-Plastics	68.1
Industrial-Stone-Clay-Glass	796.6
Commercial-College	12.5
Commercial-Grocery	58.4
Commercial-Healthcare	21.3
Commercial-Lodging	13.1
Commercial-Office - Large	24.4
Commercial-Office - Small	17.4
Commercial-Other Commercial	15.8
Commercial-Restaurant	28.8
Commercial-Retail	21.1
Commercial-School	12.8
Commercial-Warehouse	7.7

Navigant notes that MO 4 CSR 240-20.094 provides provisions for customer to "opt-out" of energy efficiency programs. For this study, Navigant incorporated the ability to consider opt-out customers in its model, which would therefore reduce the potential savings since some customers are therefore guaranteed not to participate in any program. Early results provided to the Companies included such reduction in overall potential. However, at the time of this report, the list of opt-out customers was very much in flux due to changes in customer decision-making regarding opt-out. As such, we collectively agreed with the Companies that we would not reduce the potential results of this study to exclude opt-out customers. However, we note that the latest data available indicated that, for GMO, approximately 19% (on an energy consumption basis) of GMO's large C&I customers were likely to opt out[14]. Data were not available for KCP&L MO and KCP&L KS.

2.1.2 Onsite Sample Design

Using the customer breakdown calculated in the first step, Navigant developed a stratified sample to target onsite data collection in each customer segment. The sample was designed to target 10% relative precision with 90% confidence at the sector level (i.e., Residential, Commercial, Industrial) across KS and MO. Additional detail, including the further stratification by customer energy consumption, is provided in Appendix B.

[14] kWh for KCP&L-GMO customers exercising the opt-out option. Data taken from MO Public Commission Staff opt-out list provided to the KCP&L-GMO for verification on January 10, 2013.

Table 2-3. Target vs. Actual Onsite Surveys

Sector	Segment	Target/Actual Total
Commercial	College	6/6
	Grocery	6/8
	Healthcare	9/9
	Lodging	6/6
	Office - Large	9/7
	Office - Small	23/21
	Other Commercial	9/9
	Restaurant	6/7
	Retail	9/9
	School	9/9
	Warehouse	6/6
	Commercial Total	**98/97**
Industrial	Chemicals	7/3
	Electronics	5/3
	Food	7/9
	Motor Freight Transportation	5/2
	Other Industrial	8/13
	Rubber-Plastics	5/9
	Stone-Clay-Glass	5/3
	Industrial Total	**42/42**
TOTAL C&I		**140/139**
Residential	Multifamily	14/14
	Single Family	56/55
	Residential Total	**70/69**
TOTAL (C&I and Residential)		**210/208**

2.1.3 Onsite Data Collection

Commercial/Industrial

Professionally trained surveyors surveyed the sites of 139 C&I customers across the Companies' service territories (97 commercial and 42 industrial sites), which were randomly recruited by telephone according to the stratified sample design. The surveyors collected detailed inventories of energy-using equipment and building characteristics by inspection and, at some of the larger sites, by customer-provided schedules of equipment. Surveyors also collected operation and power management behavior by interview including specifics on combined heat and power, if present.

Data collected were extensive; on average, 8 hours were spent per C&I site. Data collected covered all relevant energy aspects of customer facilities and businesses, including:

- Building size and orientation
- Building envelope information, such as insulation levels and wall and window sizes
- Complete inventories of energy-using equipment covering all end uses, including lighting, HVAC, motors, water heating, commercial refrigeration, cooking, office equipment, air compressors, and other types of process equipment
- Equipment and operation schedules and controls

The survey used to collected onsite data for C&I customers can be explored further in Appendix K.

Residential

Professionally trained surveyors surveyed the sites of 69 KCP&L and GMO residential customers that were randomly recruited by telephone according to the stratified sample design. Surveyors conducted a brief interview with the customer regarding occupancy information and age of the home. The surveyors collected detailed inventories of energy-using equipment and building characteristics by inspection.

The inspection covered all relevant energy aspects of the home:

- Home size and orientation
- Building envelope information, such as insulation levels and wall and window sizes
- Complete inventories of energy-using equipment covering all end uses, including lighting, HVAC, motors, water heating, refrigeration, cooking, and electronic equipment

Surveyors used various tools for their inventory, including hot water thermometer, metered water container, and measuring tape. In addition, surveyors collected information on household characteristics, equipment usage, and maintenance from the resident.

The survey used to collected onsite data for residential customers can be explored further in Appendix J.

2.1.4 Energy Consumption Breakdown and Forecast

Navigant's potential study analysis is conducted at the measure level and is disaggregated by customer segment. As a result, the breakdown of energy consumption at the customer segment level combined with measure-level savings characteristics (which in some cases vary by customer segment) are the key drivers of potential study output. As a result, the potential study approach does not rely on a forecast that is broken down by customer end-use category. Some potential study approaches rely heavily on the end-use category breakdown, as they estimate savings as a fraction of the end-use category consumption. However, since this model is more granular and uses a bottom-up approach aggregating the savings of each measure, the end-use breakdown assumptions provided in this section are for information purposes only.

The Companies provided Navigant with a baseline energy forecast for each of the three utilities and was further disaggregated by sector (Residential, C&I). Navigant reviewed this forecast and did not suggest any adjustments, though we understand that an updated forecast is under development by the Companies. The baseline energy forecast data were used to estimate a breakdown of the forecast into eight end-use categories over the 20-year forecast horizon. To estimate a baseline energy consumption breakdown by end-use categories, the Navigant team used a combination of building simulation modeling (for the residential sector) and a bottom-up summation of energy consumption at the measure level (for the C&I sector), as described below.

For the residential sector, the 2014 residential sector energy consumption forecast was split into end-use categories using calibrated building simulation modeling. A description of the building simulation modeling that was conducted is expanded upon in section 2.2.3. The output of this modeling effort generated hourly load profiles (24 hours x 365 days) for residential homes and 3 HVAC configurations (Electric Resistance/AC, Gas Furnace/AC, Heat Pump) broken down by different end-use categories. Weighted average annual load consumption estimates were then calculated using the weightings by HVAC type calculated from the onsite data. These weighted-average load profiles were then used to estimate the base year percentage split by residential end-use categories (Lighting, Hot Water, HVAC, and Appliances/Electric/Other). The base year split among the end-use categories was assumed to be constant over the forecast horizon for simplicity. Though again, since this forecast breakdown by end use does not drive model results, the simplification does not impact the overall study results.

To estimate a percentage breakdown for C&I end-use categories, the Navigant team used the building stock forecast (disaggregated by customer segment) discussed in section 2.1.1 combined with measure characterization results such as base consumption, efficient measure consumption, and technology 'density' (see section 2.2) to estimate total energy consumption of all measures characterized in the study. The measure level usage data was then aggregated into C&I end-use categories (HVAC, Lightings, Motors/Process/Other, Hot Water/Refrigeration/Cooking) to estimate the base year percentage split by C&I end-use categories. The residential and C&I percentage breakdowns calculated as described were applied to the KCP&L baseline energy forecast to estimate the energy consumption by end-use categories over the modeling horizon, as shown below.

As can be seen in Figure 2-4, KCP&L GMO's energy forecast grows at a faster rate than does the KCP&L MO and KCP&L KS forecast. The compound annual growth rates of energy for these three utilities are 1.84%, 1.01%, and 1.25% per year for KCP&L GMO, KCP&L MO, and KCP&L KS, respectively. This difference is a key driver of differences in the calculated savings potential (as a percentage of baseline sales) among the three utilities.

Figure 2-2. End-Use Energy Consumption Forecast, in MWh - KCP&L GMO

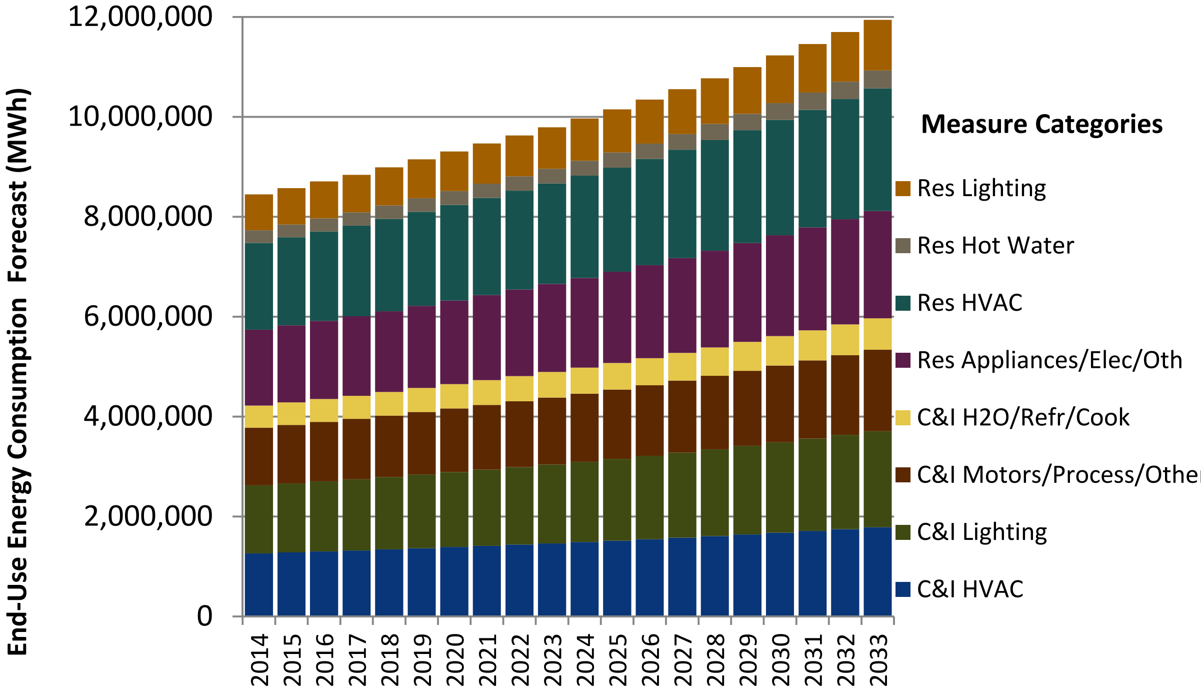


Figure 2-3. End-Use Energy Consumption Forecast, in MWh - KCP&L MO

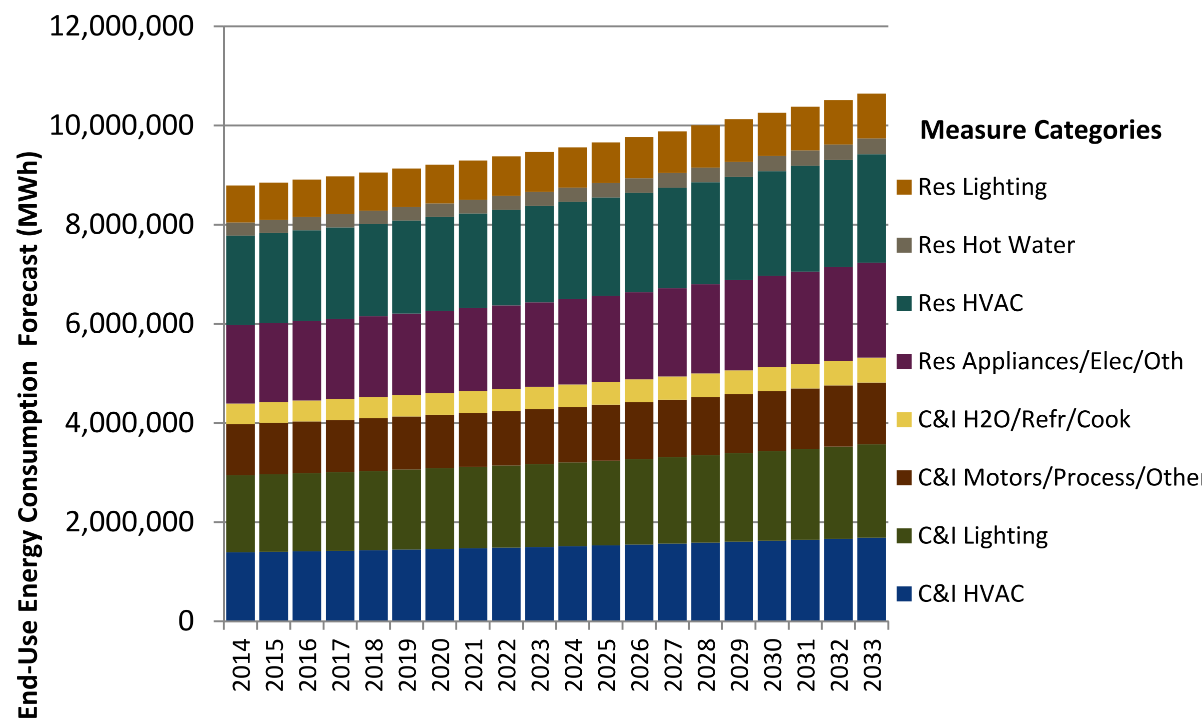
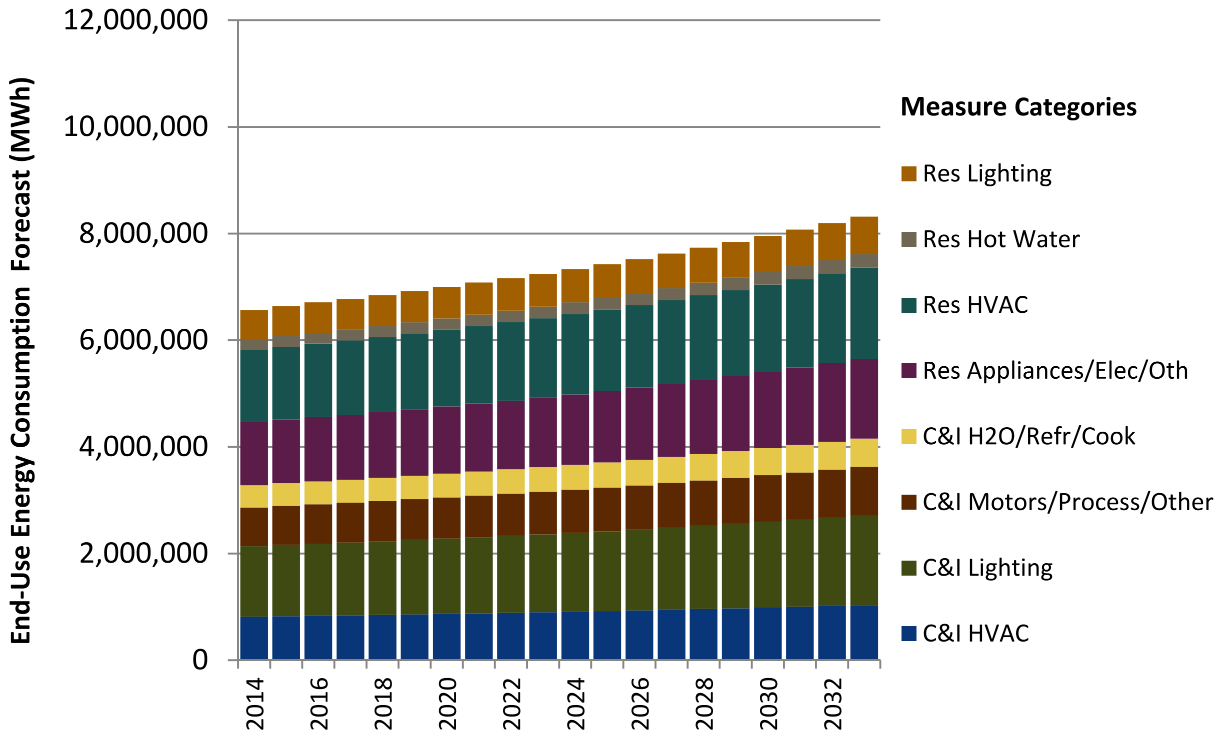


Figure 2-4. End-Use Energy Consumption Forecast, in MWh - KCP&L KS



2.2 *Measure Identification and Characterization*

2.2.1 Measure List Development

Navigant developed a comprehensive measure list of conventional and emerging technologies as the first step in the measure characterization process. The initial measure list was identified through a review of a) previous DSM potential studies conducted for the state of Missouri and other Missouri utilities[15,16], b) other Navigant potential, evaluation and program design work, and c) existing KCP&L program descriptions and custom applications. Navigant then modified the measure list – both adding and deleting measures - to incorporate feedback from KCP&L and Missouri stakeholders. Overall, 500 total measures were considered across the sectors and end-uses listed below, with 300[17] characterized for the final model. The final list of measures, including detailed measure characterization results, can be found in Appendix A.

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[15] Missouri Statewide DSM Potential Study – Final Report – Appendix J (i.e. MO DSM Study), published by KEMA consulting on March 04, 2011.
[16] AmerenUE Demand-side Management (DSM) Market Potential Study Volume 3: Analysis of Energy-Efficiency Potential (i.e. AmerenUE DSM Study), prepared by Global Energy Partners, January 2010.
[17] Measures that were not characterized either had low or no density per the baseline data collection effort, or were accounted for by other measures. For example, rather than characterizing "Best Practices", "Improved Operations", and "State of the Art" measures for Data Centers, potential savings from these measures are all captured in "Best Practices."

» **Residential :** Lighting, Space Cooling, Space Heating, Ventilation, Water Heating, Refrigerators, Freezers, Cooking, Clothes Washers, Clothes Dryers, Television, Personal Computers, Fans, Plug Loads, Behavioral

» **Commercial :** Heating, Space Cooling, Ventilation, Water Heating, Refrigeration, Lighting, Office Equipment, Cooking Equipment, Combined Heat and Power (CHP), Data Centers, Behavioral

» **Industrial:** Machine Drives, Space Heating, Space Cooling, Ventilation, Lighting, Process Heating, CHP, Compressed Air, Fans, Pumps, Refrigeration, Transformers

2.2.2 Measure Characterization Inputs

The measure characterization consisted of estimating/defining 22 key parameters across the 11 commercial, seven industrial, and two residential customer segments, all of which are input to the potential model and used in the calculation of technical, economic, and market potential. These parameters are listed and defined as follows:

1. ***Measure Definition (four parameters)*** – The following variables are used to qualitatively define each measure that is characterized.
    a. **Measure Application–** characterizes the measure as a retrofit (RET), replace-on-burnout (ROB), and/or new (NEW) application. The baseline definition and cost basis for each application is as follows:
        i. *RET* – The baseline is considered the existing equipment and the measure cost is considered the full installed cost of the efficient equipment.
        ii. *ROB* – The baseline is considered the least cost, code-compliant option and the measure cost is considered the incremental cost between the efficient and code-compliant equipment.
        iii. *NEW* - The baseline is considered the least cost, code-compliant option and the measure cost is considered the incremental cost between the efficient and code-compliant equipment.
    b. **Baseline Definition –** describes the baseline technology being characterized. For RET measures, the baseline is defined by characteristics sourced from the on-site data collection effort, when applicable.
    c. **EE Definition –** describes the efficient technology being characterized per the resources mentioned above, or Navigant's professional judgment.
    d. **Unit Basis –** the normalizing unit for energy, demand, cost, and density estimates.
2. ***Annual Energy Consumption (three parameters)*** – the annual energy consumption in kilowatt-hours (kWh) for each of the base, code-compliant and energy efficient technologies. Base consumption is equivalent to Code consumption for ROB and NEW measures.
3. ***Coincident Electric Demand (three parameters)*** – the peak coincident demand in kilowatts (kW) for each of the base, code-compliant and energy efficient technologies. The coincident peak demand period is assumed to be 3pm-5pm weekdays in August, as recommended by KCP&L. The Base and Code demand are equivalent for ROB and NEW measures.

4. ***Annual Natural Gas Consumption (three parameters)*** – Given that KCP&L is an electric utility, technologies focused primarily on natural gas savings were not evaluated. However, for those measures which result in both significant electric and gas savings – such as shell and envelope measures - the annual gas consumption is estimated in therms for the base, code-compliant, and energy efficient cases, to support benefit cost calculations. Base consumption is equivalent to Code consumption for ROB and NEW measures.

5. ***Measure Lifetime (two parameters)*** – the lifetime in years for the base/code and energy efficient technologies. The Base/Code and EE lifetime only vary in instances where the two cases represent inherently different technologies, such as LED or CFL bulbs compared to a baseline incandescent.

6. ***Incremental Costs (three parameters)*** – the following variables are used as inputs to estimate measure costs.

    a. **<u>Base/Code Material Costs –</u>** the cost of the base or code compliant equipment. Only applicable for ROB and NEW applications.

    b. **<u>EE Material Costs –</u>** the cost of the energy efficient equipment.

    c. **<u>Labor Costs –</u>** the cost of installing the technology. Labor costs are only applied for RET measures. The analysis assumes no variation in labor costs between the base/code and efficient cases.

7. ***Net-to-Gross Ratio (one parameter)*** – adjusts savings and costs in the benefit cost tests to account for free-ridership and spillover. This analysis assumes a Net-to-Gross Ratio of 1.0 for all measures, except for appliance turn-ins, which assumed a NTG ratio of 0.52, consistent with discussion among stakeholders and a study performed by JACO for the Companies. A NTG of 1.0 is assumed for the base case analysis for simplicity due to inherent uncertainty in forecasting NTG ratios for new measures and programs. However, we also ran a scenario on total realistic achievable potential assuming instead a NTG ratio of 0.8 for all measures except appliance turn-ins, where 0.52 is assumed.

8. ***Technology Densities (two parameters)*** – the following variables define the saturation of the baseline and energy efficient technologies in KCP&L territory. The values are on a "per home" basis for the Residential sector, and on a "per 1000 square feet of building space" for the Commercial and Industrial sectors. All values are calculated from customer segment-specific information sourced from the baseline data collection effort. When customer segment data was under-sampled or unavailable, secondary literature and professional judgment was used to derive an appropriate value.

    a. **<u>Base Density –</u>** the saturation of the baseline equipment in KCP&L territory for a given customer segment.

    b. **<u>Total Maximum Density –</u>** the total number of both the baseline and efficient case for a given technology.

9. ***Technology Applicability (one parameter)*** – The percentage of the base technology that can be reasonably and practically replaced with the specified efficient technology. For instance, occupancy sensors are only practical for certain interior lighting fixtures (an applicability less than 1.0), while all existing incandescent exit signs can be replaced with efficient LED signs (an applicability of 1.0).

2.2.3 Measure Characterization Approaches

The characterization team employed a variety of analytical approaches to estimate annual energy savings and coincident peak demand savings for each measure including: engineering algorithms, building energy computer simulation models, and secondary resources.

The majority of measures employed engineering algorithms and appropriate inputs from different Technical Reference Manuals. When possible, the team sourced estimates from TRMs for mid-western states and utilities to capture effects of climate and regional similarities. These include the TRM submitted by Ameren Missouri[18], as well as the statewide TRM for Illinois[19]. TRMs also served as good resources for estimating costs and measure lifetimes.

Most building envelope measures were characterized through the use of building simulation models. For residential envelope measures, six models were constructed using BEopt™ software and calibrated to customer billing data. The six models were based on characteristics sourced from the baseline data collection effort and represent two customer segments (Single Family and Multi-Family) and three HVAC configurations (Electric Resistance/AC, Gas Furnace/AC, Heat Pump).

Energy and demand for commercial envelope measures were derived from simulations leveraging the *U.S. Department of Energy Commercial Reference Building Models of the National Building Stock* with a Kansas City, MO weather file. These models covered three vintages (Pre-1980, Post-1980, and New Construction) and 14 building types (Large Office, Small Office, Warehouse, Stand-alone Retail, Strip Mall, Primary School, Secondary School, Supermarket, Quick Service Restaurant, Full Service Restaurant, Hospital, Outpatient Health Care, Small Hotel, and Large Hotel).

Simulation models were also used to estimate the percent of annual energy consumption by end use occurring in each Month, On/Off Peak Period, and day type (i.e. weekday, weekend/holiday). Allocation of energy savings is necessary for calculating monetary benefits of each measure. Load shapes used for this allocation can be found in Appendix C.

Material and labor costs were derived from a variety of resources including TRMs, online research, the California Database for Energy Efficiency Resources (DEER), potential peak reductions are relatively small and RS Means cost work. When sourcing data from DEER or RSMeans, costs were adjusted using RSMeans City Cost Indices for material and labor as indicated in Table 2-4.

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[18] *Appendix A, Technical Resource Manual, 2012 Energy Efficiency Filing.* Comments provided by the Missouri Department of Natural Resources (MDNR) were considered and accounted for in the measure characterization.
[19] *State of Illinois Energy Efficiency Technical Reference Manual*

Table 2-4. Cost Adjustment Factors based on RS Means City Cost Indices

	Adjustment from DEER			Adjustment from RSMeans		
	Material	Installation	Total	Material	Installation	Total
Other	1.00	0.85	0.96	1.00	1.03	1.01
HVAC	1.03	0.84	0.94	1.01	1.02	1.01
Electrical	1.03	0.80	0.90	1.02	0.94	0.98
Weighted Average	1.00	0.86	0.93	1.02	1.03	1.02

2.2.4 Code Adjustments

The measure characterization values are aligned with national codes and standards assumptions for 2013. To accurately assess future impacts and cost effectiveness from these measures, both the energy/demand and costs of certain measures must be adjusted to account for codes and standards changes. Navigant identified the following measures as affected by future codes and standards:

- Residential Central Air Conditioners and Heat Pumps
- Residential Room Air Conditioners and Heat Pumps
- Residential Hot Water Heaters
- Residential Refrigerators and Freezers
- Residential Dishwashers
- Residential Clothes Washers and Dryers
- Residential and Commercial Screw In Bulbs
- Commercial Linear Fluorescents

The adjustments to the baseline and efficient annual energy consumption and demand can be found on the "Energy Adjustments" tab in Appendix A. Cost adjustments can be found on the "Cost Adjustments" tab in the same file.

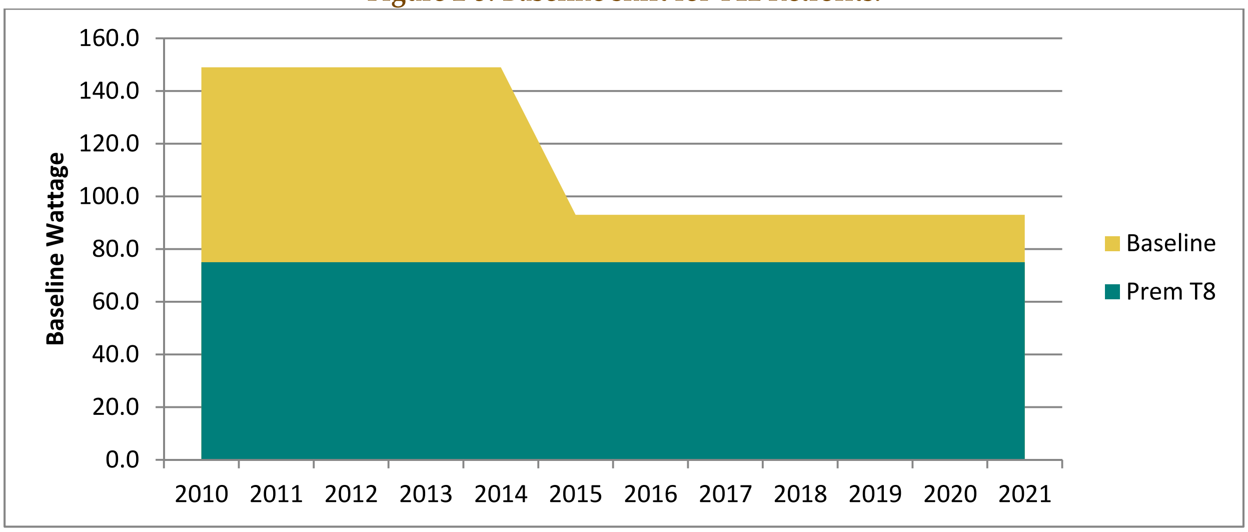
2.2.5 Treatment of T12 Retrofits

A key consideration for this analysis is the savings attributable to retrofitting T12 linear fluorescent lamp systems with T8 systems. These retrofits have been integral to successful and productive EE programs, and code changes – including the Energy Policy Act of 2005 (EPAct 2005) and Energy Independence and Security Act of 2007 (EISA 2007) - introduced increased efficacy requirements that temper the impact of these measures. These acts included specific requirements with respect to fluorescent lighting systems. EPAct 2005 laid out a timeline for phase out of magnetic ballasts. EISA 2007 included requirements for increased efficacy of fluorescent lighting.

Although magnetic ballasts have a fairly long EUL and code changes do affect the baseline for new construction, the critical date for most energy efficiency programs is July 14, 2012. This is the date specified by EISA 2007 that essentially bans the manufacture or importing of virtually all 4' T12 lamps and 700-series T8 lamps (known as commodity F32T8, standard F32T8, or SP F32T8) by setting new efficacy standards for general purpose fluorescent lamps. Most T12 lamps and 700-series T8's cannot pass these standards. Therefore, after July 14, 2012, if a T12 lamp or 700-series T8 lamp burns out, a customer will only be able to purchase a replacement lamp while existing stocks last, after which the fixture ballast and lamps will need to be upgraded.

As recommended by KCP&L and Missouri Stakeholders, savings for measures with a baseline of "Linear Fluorescent - T12" assume a T12 baseline for 2013 and 2014, and a standard T8 baseline (800 series) from 2015 on. To account for the baseline shift to T8, the model adjusts baseline kWh and kW for these measures to 63%[20] of their 2013 value (as listed in the “C&I Measures” tab in Appendix A) for 2015 on. In addition, for measures with an efficient description of "Linear Fluorescent - T8", starting in 2015, the efficient case is shifted to a "Premium T8" to address the remaining potential for linear fluorescent retrofits. As a result, the EE kWh and kW are adjusted to 81%[21] of their 2013 value for 2015 on. The baseline shift is depicted in Figure 2-5, where savings is represented by the yellow shaded area.

Figure 2-5. Baseline shift for T12 Retrofits.



2.3 *Approach to Estimation of Technical, Economic, and Market (Achievable) Potential for Energy/Demand*

Navigant estimated the technical, economic, and market Potential for this study using its proprietary Demand Side Management Simulator (DSMSim™) model. DSMSim is a bottom-up technology diffusion and stock tracking model implemented using a System Dynamics[22] framework. Figure 2-6 provides a high-level summary of the key input and output of DSMSim.

[20] A standard T8 system consumes approximately 63% of that consumed by a T12 system.

[21] A premium T8 system consumes approximately 81% of that consumed by a standard T8 system.

[22] See Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill. 2000 for detail on System Dynamics modeling. Also see http://en.wikipedia.org/wiki/System_dynamics for a high-level overview.

Figure 2-6. DSMSim Key Input and Output

Key Input

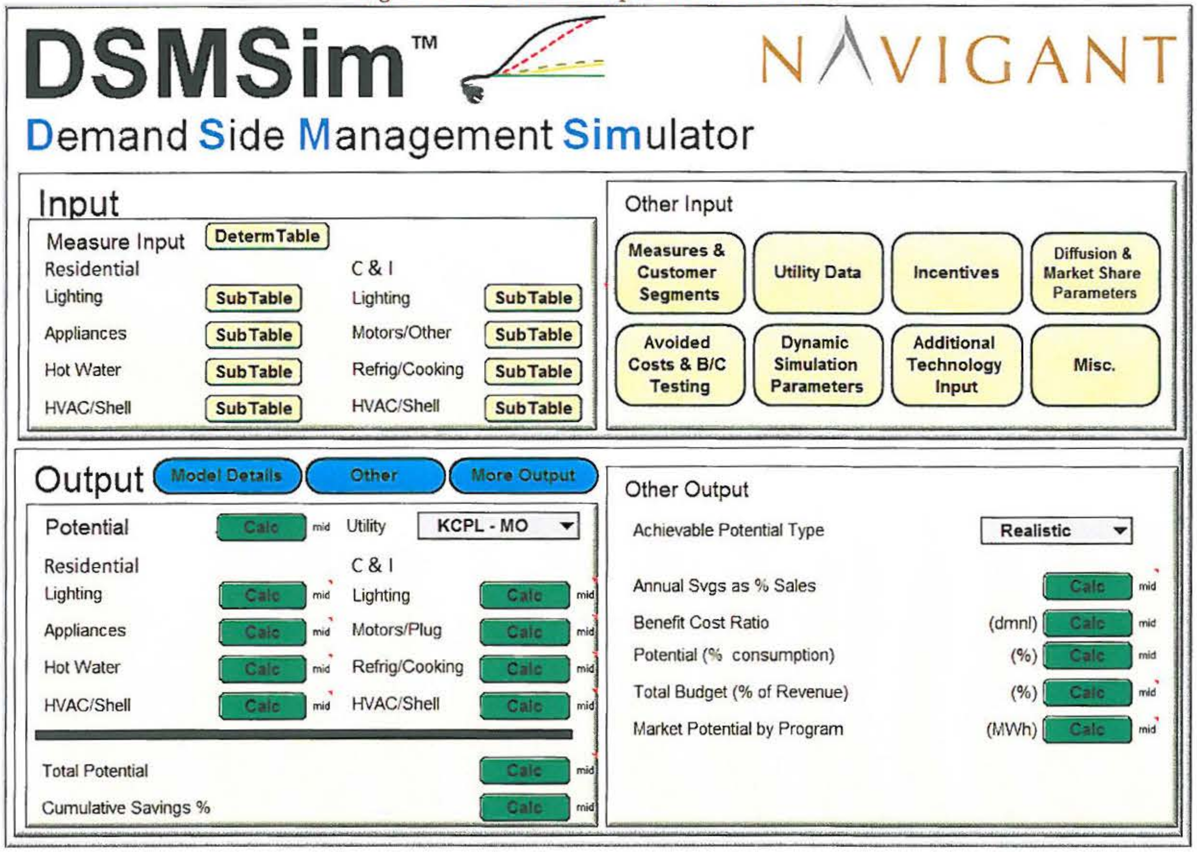
- » EE Measure Costs, Energy/Demand Savings
- » Utility Data
  - Electricity Rates, Avoided Costs, Incentives (can also be an output), Energy Sales, Demand, etc.
- » Initial Measure Saturation
- » Maximum Measure "Density" (e.g., units/home)
- » NTG Ratios
- » Consumer Sensitivity to Payback
- » Diffusion Parameters

Key Output

- » Energy/Demand Svgs (Tech/Econ/Achievable)
- » Utility Costs (Incremental and Cumulative)
- » Portfolio & Measure Benefit/Cost Ratios
- » Incentive Levels
- » Average $/kWh
- » Costs/Savings and % of Revenue & Elec. Sales

All data developed as part of the measure characterization and baseline study tasks were auto-imported into DSMSim using the graphical user interface displayed below. This interface also facilitates detailed inspection (graphical or tabular) and quality control of all model output and intermediate variables, at the measure level, across customer segments, utilities, measure end uses, and simulation scenarios.

Figure 2-7. DSMSim Graphical User Interface



2.3.1 Types of Potential

Consistent with the requirements of MO 4 CSR 240, four types of savings potential are calculated in this study – technical, economic, realistic achievable potential and maximum achievable potential. These different potential types are defined as follows:

Technical Potential: Technical potential is calculated assuming that all installed measures can *immediately* be replaced with the "efficient" technology, wherever technically feasible, regardless of the cost or market acceptance of the measure. This calculation of potential also does not take into consideration whether a measure has failed and is in need of being replaced.

Economic Potential: Economic potential is a subset of technical potential, using the same assumptions regarding immediate replacement, but limiting the calculation only to those measures that have passed the benefit/cost test chosen for measure screening. For this analysis, the total resource cost test[23] was used for measure screening and calculation of economic potential, using the utility after-tax weighted average cost of capital for the discount rate (**[redacted]** for KCP&L and **[redacted]** for GMO). The total resource test includes avoided energy, demand, and therm costs as the "benefits" in the ratio, whereas incremental measure costs are included as "costs" in the ratio. Consistent with industry practice,

[23] See California Standard Practice Manual, Economic Analysis of Demand-Side Programs and Projects. October, 2001, available at http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF

administrative costs are not included for screening at the measure level – they are considered only when estimating program level cost-effectiveness.

Maximum Achievable Potential (MAP) and Realistic Achievable Potential (RAP): Achievable potential is the most difficult and uncertain of the potentials calculated, as it estimates the energy savings that is achievable considering the following factors:

1. Market acceptance of the measure (often a function of the economics, or payback, of the measure – but other non-economic factors are also sometimes considered in market acceptance);
2. Dynamics of turning over long-lived technology stocks, since technologies with longer useful lifetimes turn over more slowly than technologies with short lifetimes, affecting the likely timing of technology adoption.
3. Diffusion of technology awareness and product adoption.

In this study, the only difference between the maximum and realistic achievable potential scenarios is the assumed level of measure incentives. Refer to section 2.3.3 for a description of how incentive levels are set for RAP and MAP.

2.3.2 Approach to Simulating Achievable Potential

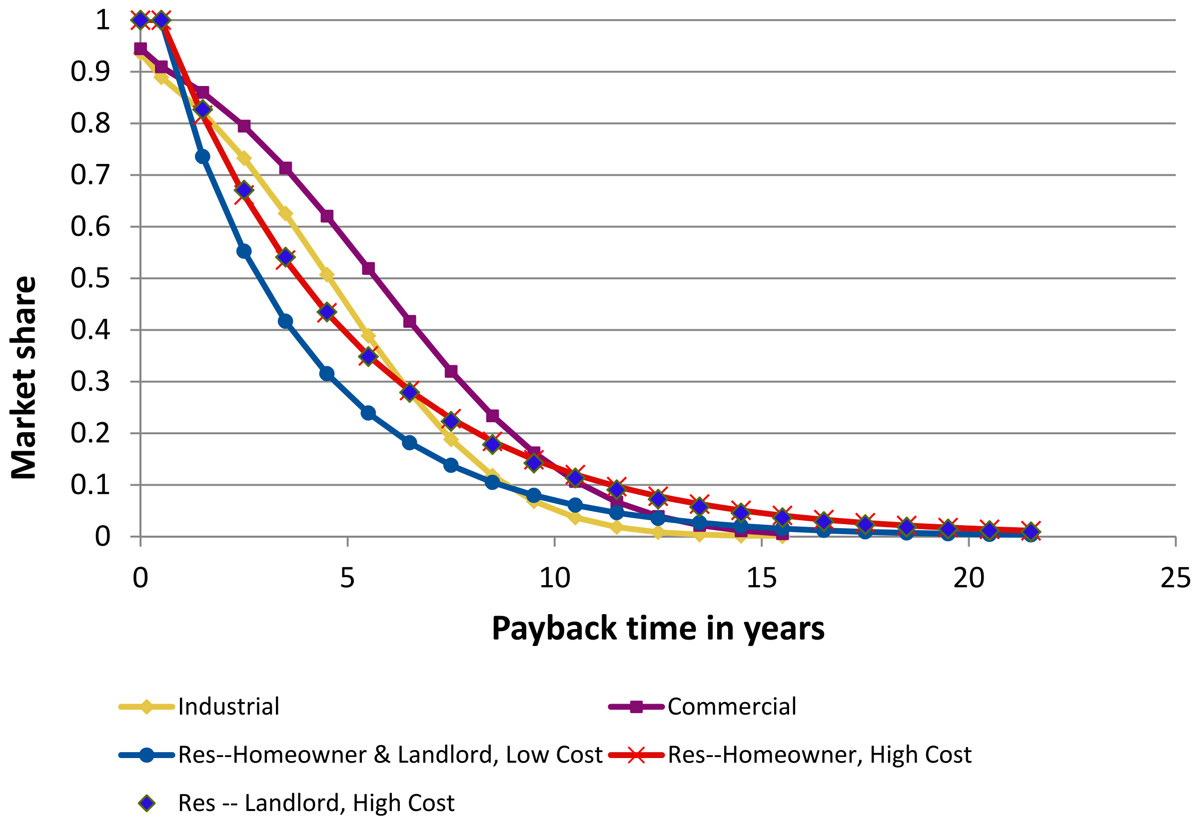
This section provides a high-level summary of the approach to calculating achievable potential, which is fundamentally more complex than calculation of technical or economic potential. The adoption of energy-efficient technologies can be broken down into calculation of the "equilibrium" market share and calculation of the dynamic approach to equilibrium market share.

Calculation of "Equilibrium" Market Share:

The equilibrium market share can be thought of as the percentage of individuals choosing to purchase a technology provided those individuals are fully aware of the technology and its relative merits (e.g., the energy- and cost-saving features of the technology). For energy-efficient technologies, a key differentiating factor between the base technology and the efficient technology is the energy and cost savings associated with the efficient technology. Of course, that additional efficiency often comes at a premium in initial cost. In efficiency potential studies, equilibrium market share is thus often calculated as a function of the payback time of the efficient technology relative to the inefficient technology. While such approaches certainly have limitations, they are nonetheless directionally reasonable and simple enough to permit estimation of market share for the dozens or even hundreds of technologies that are often considered in potential studies.

In this study, Navigant used equilibrium "payback acceptance" curves that were developed using primary research conducted in the KS and MO service areas. The final curves used in the model are illustrated below in Figure 2-8; details regarding their estimation are provided in Section 2.4.

Figure 2-8. Payback Acceptance Curves



Since the payback time of a technology can change over time, as technology costs and/or energy costs change over time, the "equilibrium" market share can also change over time. The equilibrium market share is therefore recalculated for every time step within the market simulation to ensure the dynamics of technology adoption take this effect into consideration. As such, "equilibrium" market share is a bit of an oversimplification and a misnomer, as it can itself change over time and is therefore never truly in equilibrium, but it is used nonetheless to facilitate understanding of the approach. The above curves were used for all technologies except residential lighting and appliance turn-ins (which have no calculable payback time), where a multinomial logit model[24] was employed.

Calculation of the approach to equilibrium market share:

Two approaches are used for calculating the approach to equilibrium market share, one for new technologies or those being modeled as a "retrofit" measures, and one for technologies simulated as "replace-on-burnout" (ROB) measures. Each of these approaches can be better understood by visiting Navigant's technology diffusion simulator, available at:
http://forio.com/simulate/navigantsimulations/technology-diffusion-simulation.
A high-level overview of each approach is also provided below.

Retrofit/New Technology Adoption Approach

[24] See Ben-Akiva, Moshe and Lerman, Steven R. *Discrete Choice Analysis: Theory and Application to Travel Demand*, MIT Press 1985.

Retrofit and new technologies employ an enhanced version of the classic Bass diffusion model[25,26] to simulate the S-shaped approach to equilibrium that is observed again and again for technology adoption. Figure 2-9 provides a stock/flow diagram illustrating the causal influences underlying the Bass model. In this model, market potential adopters "flow" to adopters by two primary mechanisms – adoption from external influences, such as marketing and advertising, and adoption from internal influences, or "word-of-mouth." The "fraction willing to adopt" was estimated using the payback acceptance curves illustrated in Figure 2-10.

The marketing effectiveness and word-of-mouth parameters for this diffusion model were estimated drawing upon case studies where these parameters were estimated for dozens of technologies[27]. Recognition of the positive, or self-reinforcing, feedback generated by the "word-of-mouth" mechanism is evidenced by increasing discussion of the concepts such as social marketing as well as the term "viral," which has been popularized and strengthened most recently by social networking sites such as Facebook and YouTube. However, the underlying positive feedback associated with this mechanism has been ever present and a part of the Bass diffusion model of product adoption since its inception in 1969.

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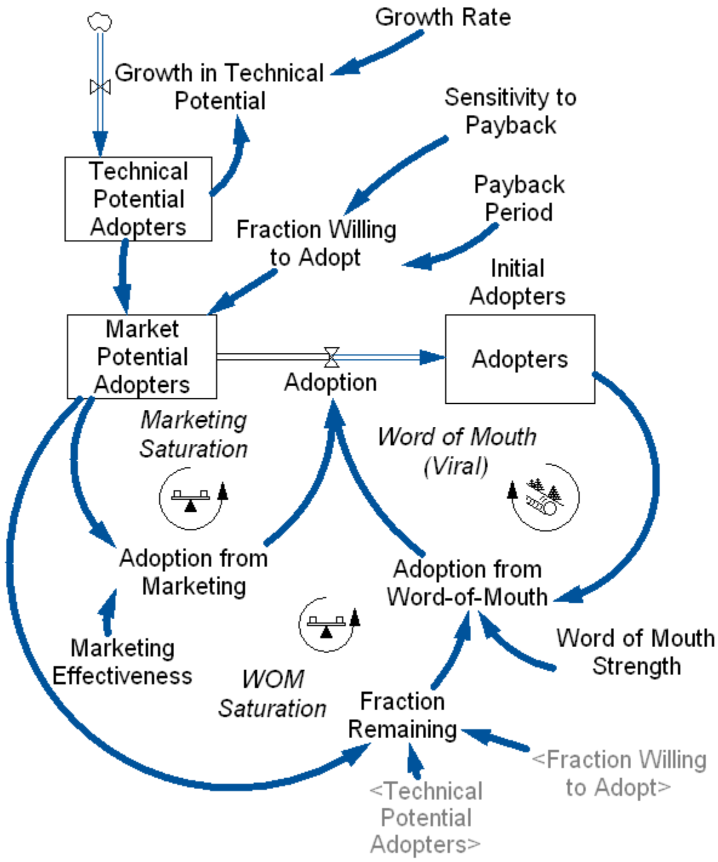
[25] Bass, Frank (1969). "A new product growth model for consumer durables". Management Science 15 (5): p215–227.
[26] See Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill. 2000. p. 332.
[27] See Mahajan, V., Muller, E., and Wind, Y. (2000). New Product Diffusion Models. Springer. Chapter 12 for estimation of the Bass diffusion parameters for dozens of technologies. This model uses the median value of 0.365 for the word-of-mouth strength in the base case scenario. The Marketing Effectiveness parameter was assumed to be 0.04, representing a somewhat aggressive value that exceeds the most likely value of 0.021 (75^{th} percentile value is 0.055) per Mahajan 2000.

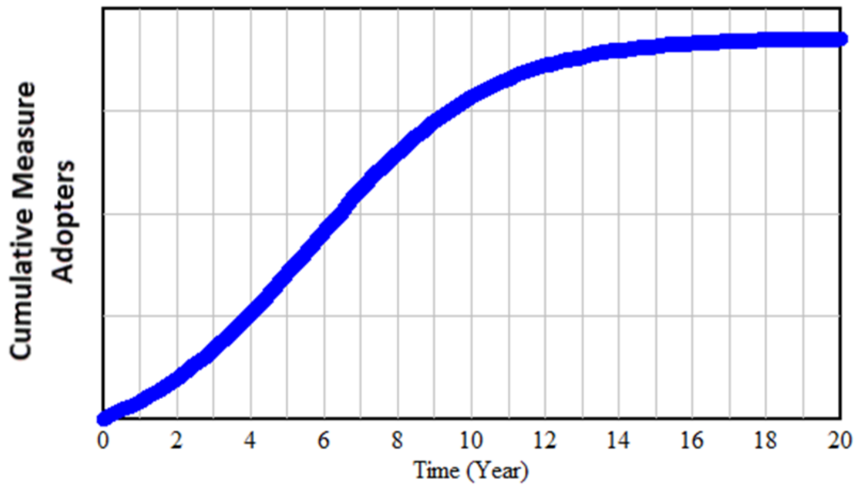
Figure 2-9. Stock/Flow Diagram of Diffusion Model for New Products and Retrofits



Source: Navigant Consulting, Inc.

The model illustrated above generates the commonly seen S-shaped growth of product adoption and is a simplified representation of that employed in DSMSim. The characteristic S-shaped growth for the parameters assumed in this model is provided below in Figure 2-10 (for retrofit measures – for replace-on-burnout measures, the dynamics can be slowed due to stock turnover).

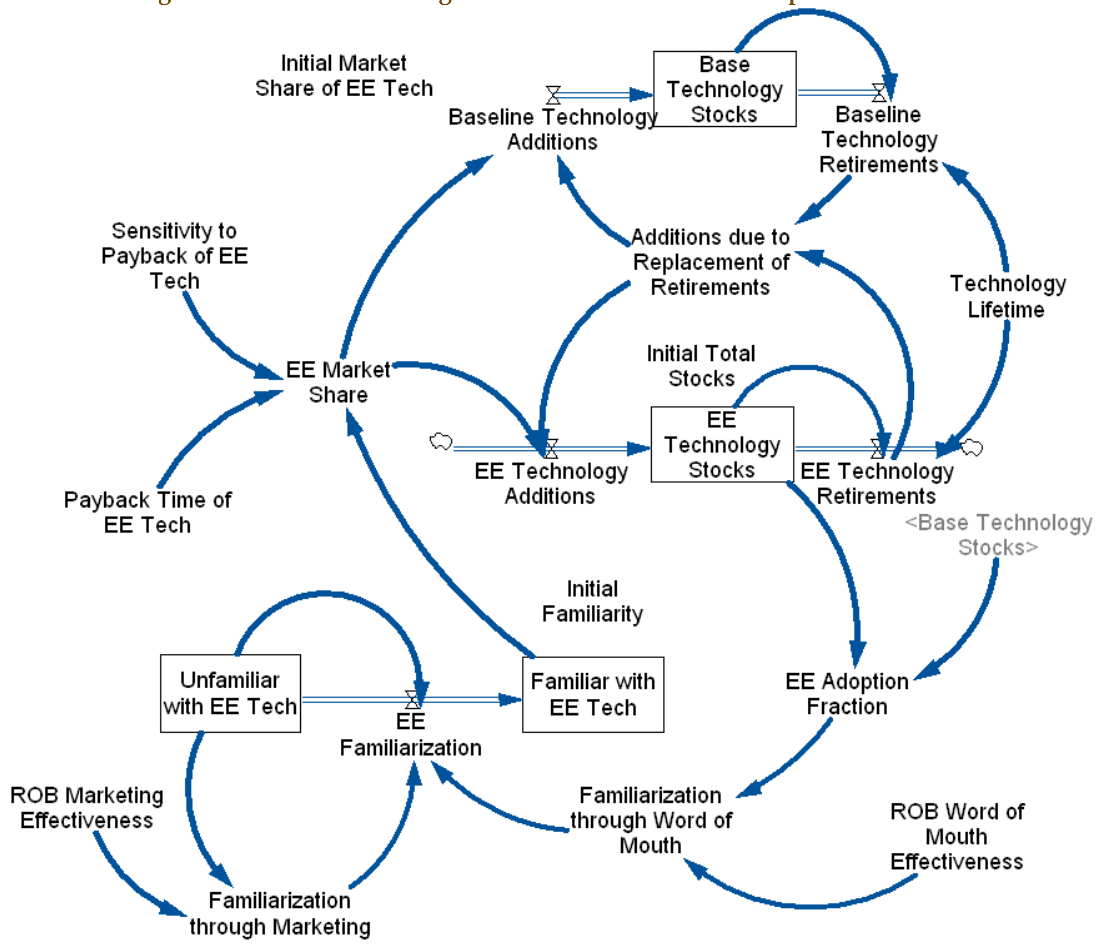
Figure 2-10. Characteristic Technology Diffusion for New/Retrofit Measures



<u>Replace on Burnout Technology Adoption Approach</u>

The dynamics of adoption for replace-on-burnout technologies is somewhat more complicated than for new/retrofit technologies since it requires simulating the turnover of long-lived technology stocks. The DSMSim model tracks the stock of all technologies, both base and efficient, and explicitly calculates technology retirements and additions consistent with the lifetime of the technologies. Such an approach ensures that technology "churn" is considered in the estimation of market potential, since only a fraction of the total stock of technologies are replaced each year, which affects how quickly technologies can be replaced. A model that endogenously generates growth in the familiarity of a technology, analogous to the Bass approach described above, is overlaid on the stock tracking model to capture the dynamics associated with the diffusion of technology familiarity. A simplified version of the model employed in DSMSim is illustrated graphically in Figure 2-11

Figure 2-11. Stock/Flow Diagram of Diffusion Model for Replace on Burnout Measures



Source: Navigant Consulting, Inc.

2.3.3 Achievable Potential Scenarios and Incentive Levels

A key component of any potential study is determining the appropriate level at which to set measure incentives for each scenario. Often, potential studies will set incentive levels by using a constant percentage of incremental cost across all measures (e.g., 33%, 50%, 75%, etc.). However, this methodology, while common in potential studies, will result in a portfolio that is more expensive than if the incentive levels are allowed to vary by measure using methods that come down the EE supply curve more efficiently[28], as we have done in this study. In this study, we follow the approach described in detail in Welch, Richerson-Smith (2012), which is summarized briefly below.

<u>Maximum Achievable Potential (MAP)</u>:
For the MAP scenario, incentive levels are set at 100% of the incremental cost of the measure. This scenario will maximize savings achieved, but will also result in a portfolio cost that far exceeds that typically encountered in efficiency programs for a given level of energy saved (as will be illustrated in

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[28] See Welch, Richerson-Smith (2012). "Incentive Scenarios in Potential Studies: A Smarter Approach" Presented at the ACEEE Summer Study on Energy Efficiency in Buildings. Monterey, CA. August 2012. Available at http://www.aceee.org/files/proceedings/2012/data/papers/0193-000050.pdf.

section 3.8). Some exceptions apply, however. For instance, in the case of CFLs and ultra-high efficiency incandescent lightbulbs, the incremental cost can actually become negative upon full implementation of the new EISA lighting standards, due to increasing costs of the baseline code-compliant bulb. However, savings opportunities still exist for these measures, since the code-compliant incandescent bulbs still consume considerably more than an efficient CFL and since some consumers will still purchase code-compliant bulbs due to issues such as lighting quality and dim-ability. As such, we still suggest offering incentives for these measures, but rather than using the incremental cost to calculate the incentive level, we have selected an incentive level of $1/bulb for CFLs and ultra-high efficiency incandescents. Additionally, appliance turn-in programs typically cover the full recycling cost of the refrigerator or freezer and further provide an incentive for a customer to participate beyond that cost. In this study, we have selected an additional incentive level of $50/appliance for refrigerator and freezer recycling.

Realistic Achievable Potential (RAP):
For the RAP scenario, we come down the efficiency supply curve by limiting the maximum $/kWh paid (calculated on a levelized cost basis) for any given measure. This methodology, as described by Welch and Richerson-Smith (2012)[29], will first reduce the incentive levels (from a starting point of 100%) of those measures that are most expensive on a levelized $/kWh basis. For instance, at a maximum threshold payment of $0.015/kWh levelized, any measure with a levelized cost below this value will still offer an incentive of 100% of incremental cost (to maximize adoption of the measures that are least expensive on a levelized $/kWh basis). Measures that exceed this levelized cost will have incentives lower than 100% in proportion to their levelized cost. For instance, a measure that has a levelized cost of $0.03/kWh would receive an incentive that is 50% of the incremental cost of that measure (or $0.015/$0.030). The threshold value of $0.015 was determined iteratively to achieve an average incentive payment (across all measures) of 50% of the incremental costs (incentive fractions were weighted by the economic potential). The value of 50%, on average, was deemed to be reasonable by the stakeholder group and is consistent with levels often seen in efficiency program design.

As with MAP incentives, exceptions do apply. CFLs and ultra-high efficiency incandescents provide incentives of $1/bulb, and appliance turn-ins offer an additional incentive of $50/appliance beyond the full recycling cost (see discussion in the MAP scenario above). Additionally, as this study also developed a set of efficiency programs designed to achieve the realistic achievable potential, certain programs deviated from the algorithm described above. For instance, measures passing through the limited income program do not follow this algorithm. Rather, the full measure cost (materials and labor) are assumed to be covered for participants in this program. In similar fashion, incentive levels in the Small Business Direct Install program were set to an average of 70%, as higher incentive levels are often used in these types of programs to get adequate program participation. Finally, as very low incentive levels can result in high free ridership, we have set a minimum percentage of incremental cost covered of 25% for all cost-effective measures.

Other Scenarios:
In section 3.8.1 we provide high-level output (cumulative savings and cumulative program costs) for additional incentive scenarios between the RAP and MAP scenarios. These scenarios help to define a type of "market potential supply curve" for energy efficiency. These intermediate scenarios follow the same algorithm set forth above for the RAP scenario, but using different thresholds for the maximum

[29] Welch, Richerson-Smith (2012). "Incentive Scenarios in Potential Studies: A Smarter Approach" Presented at the ACEEE Summer Study on Energy Efficiency in Buildings. Monterey, CA. August 2012. Available at http://www.aceee.org/files/proceedings/2012/data/papers/0193-000050.pdf.

levelized $/kWh payment (values of $0.03/kWh, $0.06/kWh, and $0.015/kWh), respectively, were used for Scenarios 1, 2, and 3 in this curve).

2.3.4 Model Calibration

Any model simulating *future* product adoption faces challenges with 'calibration,' as there is no future world against which one can compare simulated with actual results. Engineering models, on the other hand, can often be calibrated to a high degree of accuracy since simulated performance can be compared directly with performance of actual hardware. Unfortunately, DSM potential models do not have this luxury, and therefore must rely on other techniques to provide both the developer and the recipient of model results with a level of comfort that simulated results are reasonable. For this potential study, Navigant took a number of steps to ensure that forecast model results were reasonable, including:

- Comparing 2014 forecast values, by program, against claimed savings in 2011 and 2012. Although some studies indicate that DSM potential models are 'calibrated' to ensure first-year simulated savings precisely equal prior-year reported savings, we have found that forcing such precise agreement has the potential to introduce errors into the modeling process by effectively masking the explanation for differences – particularly when the measures included may be different. Additionally, there may be sound reasons for first-year simulated savings to differ from prior year reported savings (e.g., a program is rapidly ramping up, or savings estimates have changed). Thus, while we endeavored to achieve agreement to a degree believed to be reasonable between past results and forecast first-year results, we did not force the model to do so -- providing, we believe, a degree of confidence that the model is internally consistent.
- Identifying and ensuring an explanation existed for significant discrepancies between 2014 forecast savings and prior year savings, recognizing that some ramp-up is expected. For example, we noted in this process discrepancies in some programs (e.g., cool homes) due to our exclusion of some measures (e.g., early retirement HVAC) from the program due to failure to pass the TRC.
- Calculating $/first-year kWh costs for each program and comparing them with past results.
- Calculating portfolio-level $/first-year kWh costs and comparing them with values we researched through benchmarking of other utilities, which was conducted as part of this study.
- Comparing cost-effectiveness results with results from other programs Navigant has designed and/or evaluated and with values we researched through benchmarking we conducted of other utilities.

2.4 Estimation of Payback Acceptance Curves

This section describes calculation of payback acceptance curves, which, as discussed in section 2.3.3, are used to estimate the long-run, or equilibrium, market share of energy efficiency measures.

2.4.1 Objective and general approach

The objective of the analysis was to generate payback curves for each of three sectors: residential, commercial, and industrial. The approach chosen was to survey customers in the KCP&L/GMO service territory about the payback times required for the adoption of energy efficient technologies and to use these survey data to statistically estimate payback curves.

2.4.2 Sample Design for Customer Payback Acceptance Surveys

To generate separate payback curves for all three sectors, Navigant surveyed 400 commercial customers, 150 industrial customers, and 400 residential customers. All surveyed customers were in the KCP&L and GMO service territories.

Sample Stratification

The residential sector was stratified in three dimensions. First, the sample was split between 360 single-family homeowners and 40 landlords. The decision to include a small sample of landlords reflected the understanding that because landlords do not always pay for utilities, the rate of adoption of energy efficient appliances by landlords could be quite different than that for homeowners. The small sample of landlords allowed us to investigate this issue. Second, among homeowners the sample was split evenly between KCP&L respondents and GMO respondents –180 each. Third, the homeowner sample in each service territory was further stratified across three income classes: 60 with annual incomes less than $50K, 60 with incomes in the range $50K-$75K, and 60 with incomes greater than $75K. The decision to stratify by income reflected the concern that for high-cost electrical devices like refrigerators and central air conditioning units, income might be a factor in the decision to purchase the more expensive energy-efficient version of the device.

The sample of landlords was not stratified by location because of its small size and because landlords would be expected to have properties across the service territory boundaries. The commercial and industrial samples were not stratified due to expected high costs per completed survey and the reasonable hypothesis that the distribution of payback times was unlikely to vary much across sectors.

Implementation Strategy

The task of fielding the surveys was subcontracted to Ipsos Observer, a national survey firm. Web-based panels were used for the survey of residential homeowners. The advantage of such panels is that, because panel respondents choose to respond to a survey without knowing the survey topic, they eliminate the problem of issue-oriented selection bias. There is of course the possibility that an individual who agrees to sign up for such panels is different than the average individual, but it seems unlikely that this difference, if it exists, is related to the decision to purchase energy efficient technologies. Either way, this avenue for selection bias would seem far less problematic than a telephone survey in which the respondent is told the purpose of the survey at the start.

Ipsos Observer provided a census weight for each completed survey in the sample of residential homeowners. Weights were designed to match the sample distribution as closely as possible to the local census distribution of five demographic variables in each service area (KCP&L or GMO). The variables were age, income, education, gender, and race. The survey of residential landlords involved a telephone survey drawing on a client-supplied list of landlords in the service areas who previously completed a random survey for KCP&L. The survey of commercial and industrial customers involved a telephone survey drawing on a list of non-residential accounts previously provided by the client. Assignment of these accounts to the commercial and industrial sectors was based on SIC codes.

The surveys were fielded in late September 2012 and were completed by mid-October 2012. Because panel surveys are based on a first-come, first-served basis, in which panel members can opt into the survey as long as it is “open”, with the survey closing when the desired sample size is reached, there is no response rate for the residential homeowner survey. For the landlord survey the response rate, defined as the ratio of the number of completed surveys to the number of customers who either completed the survey or refused to participate, was 44%. For the survey of industrial and commercial customers the response rate was 36%.

Three survey instruments were developed: one for homeowners, one for landlords, and one for commercial/industrial. The survey instruments are in Appendix E-Appendix I. Highlights of the surveys include the following:

- The survey of commercial and industrial customers was administered only to a respondent indicating that he/she was the person "most familiar" with the management of the company's lighting, heating, and cooling technology.
- In the survey of commercial and industrial customers, respondents were asked if they had a required payback time, or an established rule of thumb concerning payback time, for the purchase of energy efficient technologies. If not, they were asked a set of questions to get at the firm's typical payback time for energy efficient technologies.
- In the residential surveys—homeowner and landlord—respondents were not asked directly about payback times. Instead, they were given a decision scenario involving the purchase of an energy efficient technology, and then asked a set of questions concerning whether they would be willing to pay $X more for the technology if it saved them $Y per year. From their responses a payback time was calculated. For instance, if the respondent was told that savings from an energy efficient refrigerator is $25/year compared to a standard version, and the respondent indicated they would buy it if it cost $75 more than the standard version, but not if it cost $100 more, then their payback time for the energy efficient technology was revealed to be greater than $75/$25/year =3 years, but less than $100/$25/year =4 years, yielding an estimated payback time of 3.5 years.
- Homeowners were asked two such willingness-to-pay questions, one from a set of low-cost devices (light bulb, power strip, DVD player), and one from a set of high-cost devices (dishwasher, large-screen TV, refrigerator, central air conditioner). This created the opportunity to investigate whether the payback curves for low-cost devices are different than for high cost devices.
- Distinguishing payback curves for high-cost and low-cost devices for rental housing is confounded by the fact that landlords are typically responsible for high-cost appliances, while tenants are the purchasers of most low-cost devices and high-cost consumer devices –that is, devices that stay with the tenant. To simplify, we assumed that the payback curves for low-cost devices estimated for homeowners are generally applicable, and focused the survey of landlords on high-cost appliances only (dishwasher, refrigerator, central air conditioner).

2.4.3 Estimating Payback Functions

The survey data generates payback times in whole years –1 year, 2 years, 3 years, etc. These data were used to estimate payback functions *F(t)* that indicate the proportion of respondents adopting an energy efficient technology if the payback time is t. We used two approaches for estimating *F(t)*. With t measured in years, the first simply plots the proportion of respondents adopting a technology with a payback time equal to t=0, 1, 2, 3, etc., and interpolates linearly between each point. This approach is called a "semi-parametric" approach because it makes no parametric assumptions about the shape of the payback curve except as expressed in linear interpolation between the market shares calculated from the data at each whole year. The advantage of the semi-parametric approach is that it imposes no assumptions about the functional form of the payback function. It's disadvantage, though, is that hypothesis testing, such as whether the payback function for the KCP&L and GMO service territories are different, or whether the payback functions for landlords and homeowners are different, is cumbersome and conceptually nuanced.[30]

In the alternative approach –parametric estimation of payback functions –hypothesis testing is straightforward. The analyst specifies and estimates a functional form for the payback function that includes both t and other variables expected to affect payback times, and tests whether these other variables do indeed have a statistically significant effect on payback. Formally, the payback function is specified as $F(t,X)$, where X is the set of additional variables.

After a review of histograms of the payback times reported in the survey data, we settled on a gamma-distributed specification for the residential version of $F(t,X)$, and a normal-distributed specification for the commercial and industrial versions of $F(t,X)$. The functions were estimated using maximum likelihood estimation, as described in Appendix A.

2.4.4 Payback Acceptance Results

Detailed results of the statistical analysis are reported in Appendix A. As discussed in Appendix A, the parametric estimates of the payback functions are very similar to the nonparametric estimates. Figure 2-12 below compares the parametric payback curves across sectors. It bears repeating that the analysis assumed that the payback curve for low-cost devices estimated for homeowners is generally applicable, whereas the analysis tests whether homeowners and landlords differ in the payback curve for high-cost devices. The figure indicates the following:

- In general, residential payback curves fall below the curves for the commercial and industrial sectors, indicating that residential customers require a shorter payback time to adopt new technology.
- The residential payback curve for high cost (>$300) devices lies above the curve for low-cost devices, indicating that in the residential sector, low-cost devices typically must have shorter payback times to capture the same market share as high-cost devices. This difference is statistically significant at the 95% confidence level.
- The residential payback curve for high-cost devices is virtually the same for homeowners and landlords. In statistical terms, it is not possible to reject at any reasonable confidence level the null hypothesis that there is no difference between these two curves.[31] While the results of this study did not reveal a difference between homeowners and landlords, Navigant notes that

[30] For instance, it's conceivable that a comparison of two non-parametric payback functions generates the result that they are statistically different at Year 1, not statistically different at Year 2, statistically different at Year 3, and so on.

[31] One possible explanation for this result is that landlords systematically misinterpreted the question to be asking about how they would behave in a hypothetical situation in which they were responsible for the rental property's utilities. This is very unlikely to be the case. First, landlords were asked to think about a *particular* property if they owned more than one, and were asked whether they or their tenants paid the electric bill. Then, just before the payback questions were asked, the following script was read to the respondent:

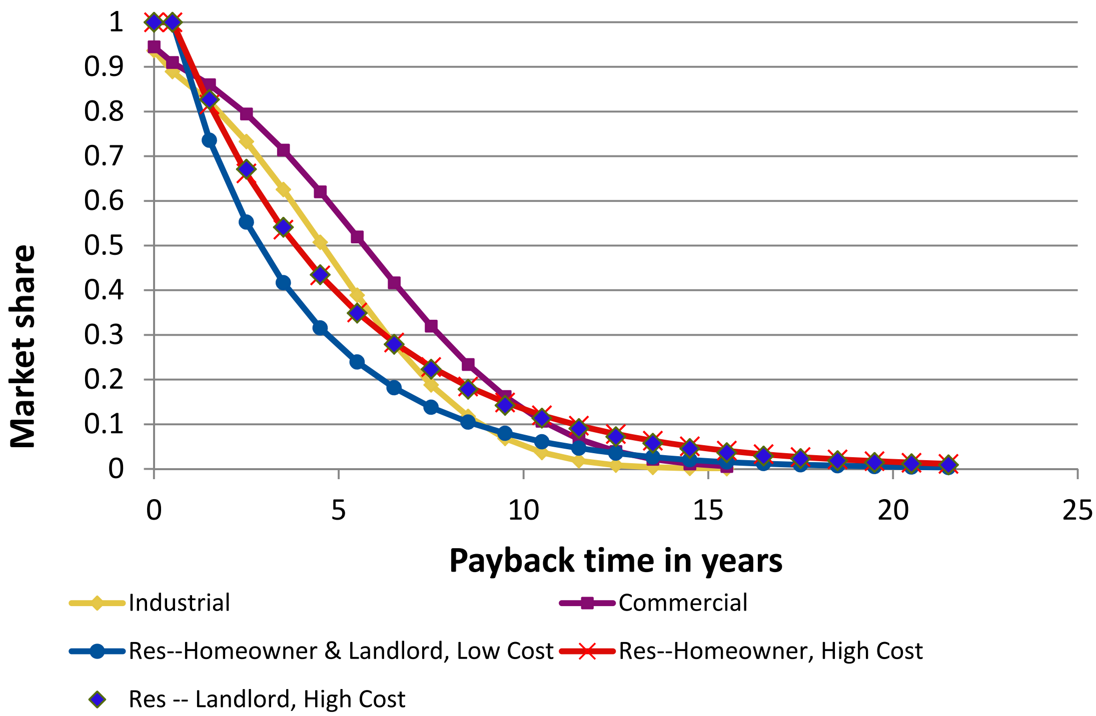
> *"The next set of questions asks about your likely purchase behavior when buying a new energy efficient appliance for your rental property. Imagine that you really are in the process of making the purchase decisions presented below, and anticipate how you would truly behave if the situation were real. Thanks for your help."*

future studies might focus in on the "landlord/tenant" issue to further explore whether forecast results might be impacted.

Two other results of interest, with details in Appendix A:

- For the residential sector there is no statistical difference in payback curves for KCPL and GMO;
- For the residential sector, demographic variables generally do not have a statistically significant effect on the payback curves.

Figure 2-12. Summary of Parametric Payback Curves



2.5 *Caveats and Limitations*

There are a number of important caveats and limitations associated with the results of this DSM potential study, as detailed below.

Opt Out Customers

At the time of this report, the list of opt-out customers was very much in flux due to changes in customer decision-making regarding opt-out. As such, we collectively agreed with the Companies that we would not reduce the potential results of this study to exclude opt-out customers. However, we note that the latest data available indicated that, for GMO, approximately 19% (on an energy consumption basis) of GMO's large C&I customers were likely to opt out[32]. Data were not available for KCP&L MO and KCP&L KS.

[32] kWh for KCP&L-GMO customers exercising the opt-out option. Data taken from MO Public Commission Staff opt-out list provided to the KCP&L-GMO for verification on January 10, 2013.

Net-to-Gross Assumptions

Due to the inherent uncertainty in forecasting net-to-gross (NTG) ratios, we agreed with stakeholders to use a NTG value of 1.0 for all measures except appliance recycling (where 0.52 was used). As such, the potential estimates herein are, for the most part, estimates of "gross" savings. Using a default net-to-gross factor of 0.8 rather than 1.0 results in roughly a 20% reduction in savings relative to that shown in this report[33]. Consideration of this caveat is important for comparing the results of this study with future achievements and for setting compliance targets.

Scenario Analysis versus Forecasts/Predictions

Estimation of market potential for energy efficiency savings is inherently uncertain. As such, the estimates provided herein are *scenario* based, and should not be considered to be forecasts or predictions of what *will* happen. Savings that will actually be achieved over the next 10-20 years depend on a large variety of factors, including incentive levels for each measure, effectiveness of program design, execution and marketing efforts, degree of success of emerging technologies, future fuel/electricity prices, measure costs, and economic factors, among many others.

Market Uncertainties

A number of uncertainties exist regarding the market acceptance of energy-efficiency measures. For instance, the primary method employed in this study for calculating equilibrium market share of efficient technologies is use of "payback acceptance curves," which are commonly used in potential studies as a reasonable and tractable approach to estimate market share for dozens or even hundreds of technologies. However, this approach is limited in its ability to account for non-monetary product purchase considerations. When combined with the other market dynamics considered in Navigant's DSMSim model, this approach should provide directionally reasonable estimates. However, it is subject to limitations and uncertainty that would likely be cost-prohibitive to mitigate (e.g., via detailed discrete choice analysis studies for each measure). Additionally, while Navigant's DSMSim model employs advanced technology diffusion theory, diffusion parameters are also uncertain (e.g., marketing effectiveness).

Data Uncertainties

Navigant drew upon many data sources, both primary (e.g., from the baseline study) and secondary, for estimation of measure energy consumption, incremental cost, and market saturation. However, uncertainty in these estimates inevitably exists, which can affect estimates of potential. Navigant did not conduct parametric or other uncertainty analysis on the unit-energy-savings, cost estimates, or initial market saturation estimates as part of this study.

[33] Most measures still passed the TRC.

3. KCP&L and GMO Energy Efficiency Potential Results

In this section, we summarize the potential for energy and peak demand savings from energy efficiency measures. The potential for combined heat and power savings is described in section 4. The potential for demand response program savings is detailed in a separate stand-alone report entitled "Demand-Side Resource Potential Study Report – Demand Response," dated June 2013.

We first describe in section 3.1 the technical, economic, maximum achievable (MAP) and realistic achievable (RAP) savings potential (energy and peak demand) in aggregate for KCP&L KS, KCP&L MO and KCP&L GMO. Subsequent sections (0 through 3.5) disaggregate the savings potential by customer segment, end use category, and program. We provide these disaggregated results for the realistic achievable potential scenario only. In section 3.6, we provide estimated costs, by program, to achieve the realistic potential savings. Finally, we provide in section 3.8 two types of supply curves that illustrate 1) the cost to achieve savings at levels higher than the RAP scenario (up to the MAP scenario), and 2) the levelized cost of electricity saved as a function of cumulative savings for both RAP and MAP.

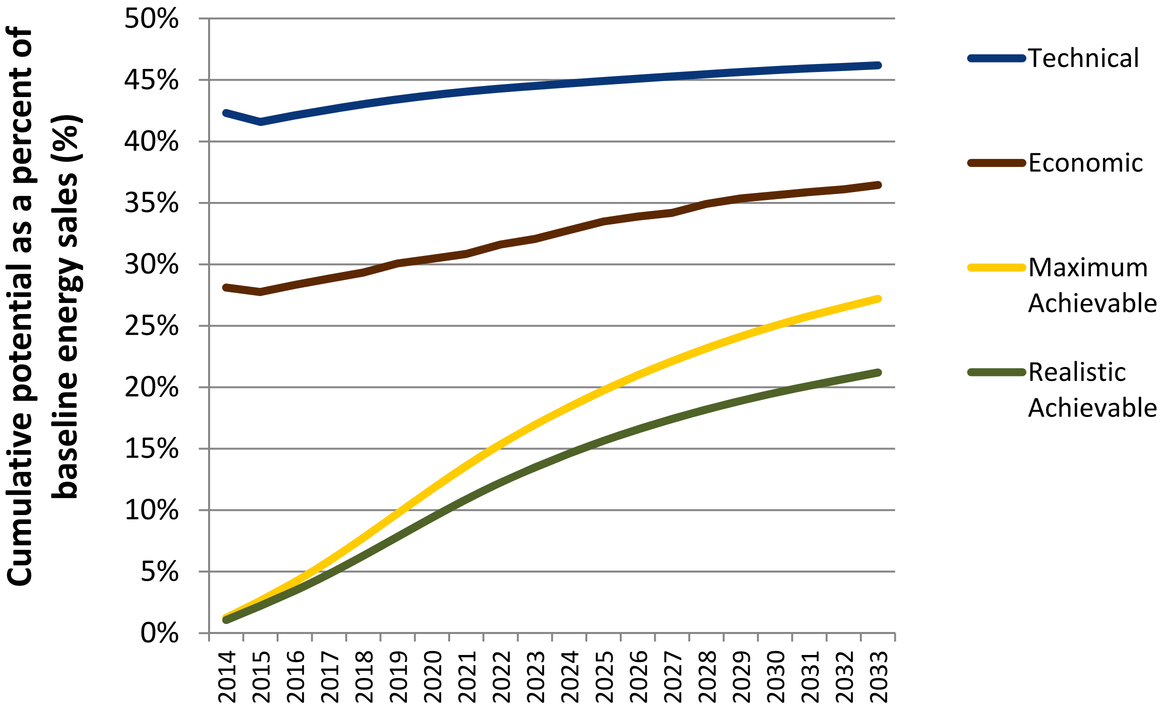
3.1 Aggregate Savings Potential

This section summarizes the aggregate savings potential for energy and peak demand, including technical, economic, MAP, and RAP scenario results for KCP&L KS, KCP&L MO, and KCP&L GMO. For energy savings potential, in addition to providing absolute values (in MWh), we also illustrate the potential as a percentage of baseline forecast energy sales (exclusive of EE savings), as stakeholders are often interested in this metric. Looking at the cumulative savings as a percentage of baseline forecast sales offers a way to compare results with other potential studies as well as with achieved savings from past programs in other service territories.

3.1.1 Aggregate Savings Potential – KCP&L GMO

Figure 3-1 illustrates the potential for energy savings as a percentage of KCP&L GMO's baseline energy forecast. As seen in this figure, technical potential represents between 41-46% of baseline energy sales over the 20-year forecast horizon, whereas economic potential ranges from about 27%-36% over the forecast horizon. There are sometimes "kinks" in the technical and economic potential curves (e.g., in 2015 and 2028) due to two factors. First, code and standard changes result in adjustment to baseline energy consumption assumptions (e.g., for residential lighting, T12's, etc. – see section 2.2.4). This factor is the primary contributor to the drop in technical and economic potential in 2015. Second, TRC screening is performed in every year of the simulation. As such, some measures (e.g., AC/HP evaporative pre-cooling, HPS induction lighting) that don't initially pass the TRC in the early years eventually pass the TRC in later years as avoided costs escalate. As a result, one can see an uptick in economic potential as those measures are introduced into the assumed portfolio of cost-effective measures.

Figure 3-1. Cumulative Energy Savings as % of Sales - KCP&L GMO



One can also see in Figure 3-1 that maximum achievable potential reaches 16.9% after 10 years (an average of 1.69%/year over the first 10 years of the forecast) and 27.2% by the year 2033, or about 75% of economic potential in that year. When comparing this result with the payback acceptance curves discussed in section 2.4, one may expect a higher value as a percentage of economic potential (e.g., closer to 90-95% of economic potential), since 100% of incremental costs are covered by incentives in the MAP scenario. The reason that MAP is somewhat lower is two-fold. First, the dynamics of stock turnover and growth in familiarity are such that some measures have not yet reached their "equilibrium" market share by 2033 (especially in the case of residential LEDs, which are not projected to gain significant market share until later in the simulation). Additionally, as noted in the previous paragraph, some measures don't pass the TRC until later in the simulation, meaning that they have also not yet reached their equilibrium market share values by 2033.

Figure 3-1 also shows that realistic achievable potential is 13.5% of baseline energy sales by 2023 (or 1.35%/year for the first 10 years of the forecast) and 21.2% by 2033, which is roughly 58% the economic potential in that year. Table 3-1 provides the same information shown in Figure 3-1, but in tabular format.

Table 3-1. Cumulative Energy Savings as % of Sales – KCP&L GMO

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	42.3%	28.1%	1.1%	1.2%
2015	41.6%	27.7%	2.2%	2.6%
2016	42.1%	28.3%	3.4%	4.2%
2017	42.6%	28.8%	4.8%	5.9%
2018	43.0%	29.3%	6.3%	7.8%
2019	43.4%	30.1%	7.8%	9.7%
2020	43.7%	30.5%	9.4%	11.7%
2021	44.1%	30.8%	10.9%	13.6%
2022	44.3%	31.6%	12.2%	15.4%
2023	44.5%	32.1%	13.5%	16.9%
2024	44.7%	32.8%	14.6%	18.4%
2025	44.9%	33.5%	15.6%	19.7%
2026	45.1%	33.9%	16.6%	21.0%
2027	45.3%	34.2%	17.4%	22.1%
2028	45.5%	34.9%	18.2%	23.2%
2029	45.6%	35.4%	18.9%	24.1%
2030	45.8%	35.6%	19.5%	25.0%
2031	45.9%	35.9%	20.1%	25.8%
2032	46.1%	36.1%	20.7%	26.5%
2033	46.2%	36.5%	21.2%	27.2%

In addition to viewing the cumulative realistic achievable potential as a percentage of baseline energy sales, it is also informative to look at the incremental annual potential as a percentage of baseline sales. We provide this result in Figure 3-2. As can be seen in this figure, which is effectively the slope of the cumulative potential curve[34], potential ramps up over the first several years, peaks in about 2020, and tails off in later years as the market for energy savings saturates and approaches its equilibrium value. In a simple situation where all savings are harvested over a 20-year horizon, the annual value would approach zero as the market saturates. However, it does not in this instance for a number of reasons, mainly due to the continued addition of new building stock, which continues to offer savings potential as long as the stock is growing. Additionally, some measures are being added to the portfolio in the out-years as they become cost-effective later in the forecast due to escalating avoided costs. Finally, emerging technologies such as LEDs show market penetration later in the forecast horizon as their costs and performance come down an estimated learning curve, thereby improving their competitiveness with other measures such as CFLs.

[34] This statement is true if the curves are plotted in terms of absolute magnitude of savings, but not if plotted as a percentage. While the summation of annual savings will result in the same value as the cumulative potential curve in absolute terms (e.g., in MWh), the summation of annual percentages will not add to the cumulative potential as a percentage of baseline sales.

Figure 3-2. Incremental RAP as a % of Baseline Forecast Energy Sales – KCP&L GMO

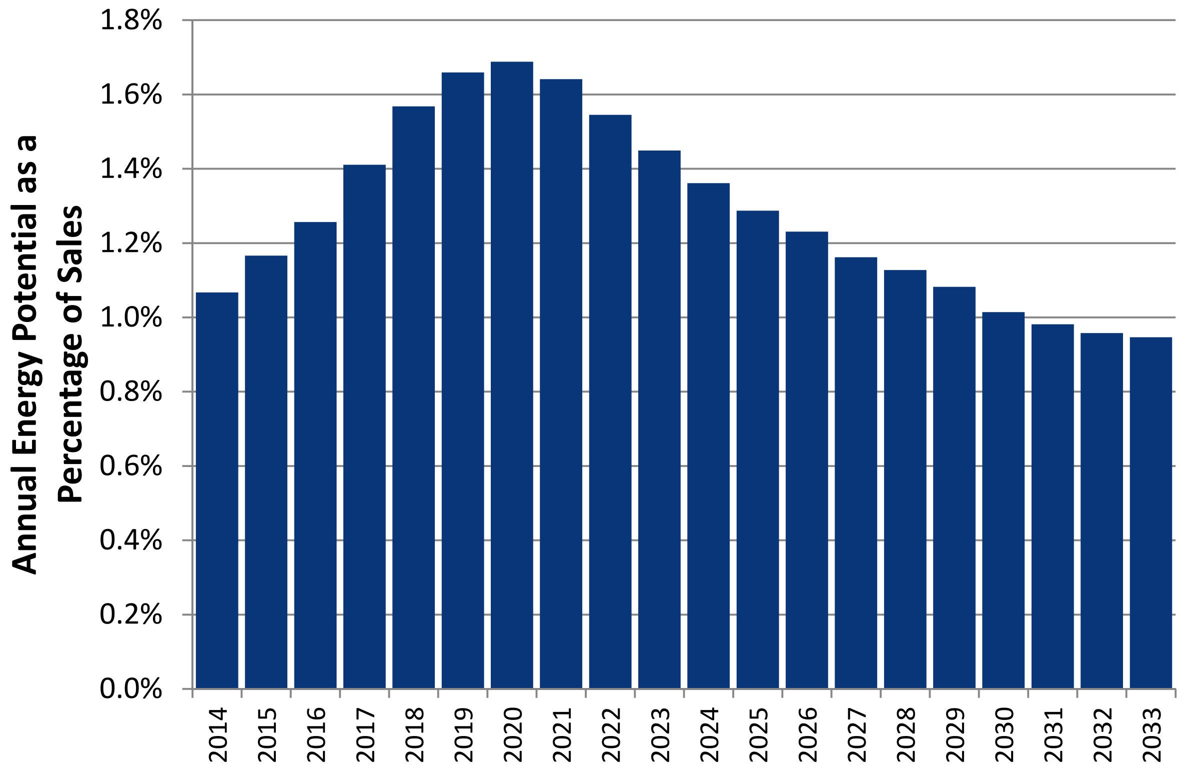


Table 3-2 shows the results described expressed in absolute savings potential (in MWh), rather than as a percentage of baseline forecast energy sales.

Table 3-2. Cumulative Energy Savings (MWh) – KCP&L GMO

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	3,604,097	2,394,376	90,895	106,150
2015	3,595,117	2,398,790	191,727	227,510
2016	3,697,376	2,486,081	302,033	364,356
2017	3,796,243	2,570,081	427,785	523,176
2018	3,899,798	2,658,253	569,884	703,168
2019	4,005,157	2,773,474	722,942	897,225
2020	4,103,282	2,857,034	881,328	1,098,957
2021	4,203,193	2,942,518	1,037,947	1,298,414
2022	4,299,936	3,068,068	1,187,910	1,490,214
2023	4,393,587	3,164,818	1,330,940	1,672,037
2024	4,492,172	3,292,540	1,467,700	1,847,554
2025	4,594,538	3,425,606	1,599,381	2,018,670
2026	4,700,944	3,531,512	1,727,665	2,187,097
2027	4,816,489	3,635,284	1,851,215	2,350,357
2028	4,933,979	3,788,766	1,973,566	2,513,766
2029	5,055,552	3,915,775	2,093,452	2,673,904
2030	5,180,364	4,028,017	2,208,148	2,826,627
2031	5,300,992	4,140,064	2,321,418	2,976,165

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2032	5,425,181	4,251,923	2,434,251	3,123,259
2033	5,554,149	4,383,342	2,548,082	3,270,051

Navigant also calculated the potential for reduction in coincident peak demand from energy efficiency measures, the results of which are illustrated below in Table 3-3.

Table 3-3. Cumulative Peak Demand Potential (MW) – KCP&L GMO

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	1,018	602	20	26
2015	1,016	606	44	57
2016	1,039	624	71	93
2017	1,061	642	102	135
2018	1,085	661	137	183
2019	1,109	684	176	237
2020	1,133	703	217	292
2021	1,156	721	257	347
2022	1,179	771	295	400
2023	1,201	790	331	450
2024	1,224	821	364	498
2025	1,248	846	395	543
2026	1,273	872	424	587
2027	1,301	895	452	629
2028	1,328	922	479	670
2029	1,357	951	506	710
2030	1,386	976	530	748
2031	1,414	1,001	555	784
2032	1,443	1,026	579	819
2033	1,473	1,053	603	853

3.1.2 Aggregate Savings Potential – KCP&L MO

Figure 3-3 illustrates the potential for energy savings as a percentage of KCP&L MO's baseline energy forecast. As seen in this figure, technical potential represents roughly 41% of baseline energy sales over the 20-year forecast horizon, whereas economic potential ranges from about 27%-34% over the forecast horizon. Maximum achievable potential reaches 16.8% after 10 years (an average of 1.68%/year over the first 10 years of the forecast) and 25.3% by the year 2033. Realistic achievable potential is 12.4% of baseline energy sales by 2023 (or 1.24%/year for the first 10 years of the forecast) and 18.5% by 2033, which is roughly 55% the economic potential in that year. For additional discussion of the drivers of the shape of these curves, including "kinks" in the curve and the magnitude of achievable potential relative to economic potential, refer to the discussion in section 3.1.3, as the drivers are similar for each utility.

Figure 3-3. Cumulative Energy Savings as % of Sales – KCP&L MO

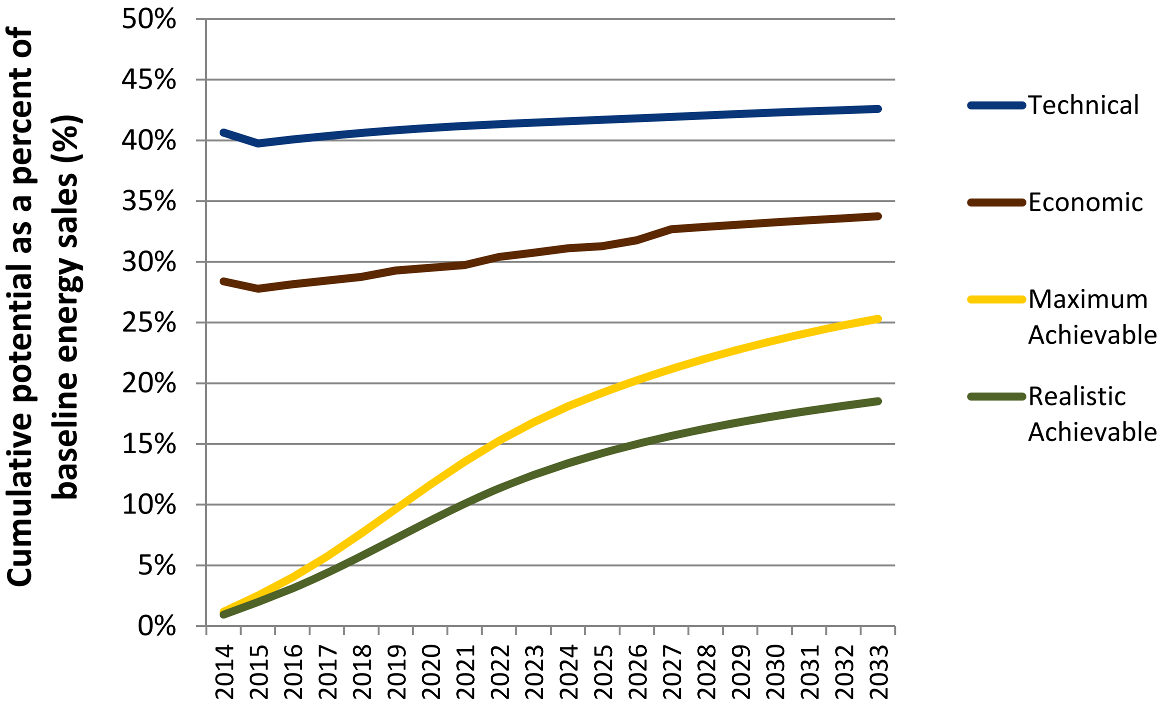


Table 3-4 provides the same information described in the figure above, but in tabular form.

Table 3-4. Cumulative Energy Savings as % of Sales – KCP&L MO

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	40.6%	28.4%	0.9%	1.2%
2015	39.7%	27.8%	2.0%	2.5%
2016	40.1%	28.1%	3.1%	4.0%
2017	40.4%	28.5%	4.4%	5.7%
2018	40.6%	28.8%	5.8%	7.6%
2019	40.8%	29.3%	7.2%	9.6%
2020	41.0%	29.5%	8.7%	11.6%
2021	41.2%	29.7%	10.1%	13.5%
2022	41.3%	30.4%	11.3%	15.3%
2023	41.5%	30.8%	12.4%	16.8%
2024	41.6%	31.1%	13.4%	18.1%
2025	41.7%	31.3%	14.2%	19.2%
2026	41.8%	31.8%	15.0%	20.2%
2027	41.9%	32.7%	15.7%	21.2%
2028	42.1%	32.9%	16.3%	22.0%
2029	42.2%	33.1%	16.8%	22.8%
2030	42.3%	33.3%	17.3%	23.5%
2031	42.4%	33.4%	17.7%	24.2%
2032	42.5%	33.6%	18.1%	24.8%
2033	42.6%	33.7%	18.5%	25.3%

As with KCP&L GMO, we provide for KCP&L MO the annual incremental realistic achievable potential as a percentage of baseline forecast energy sales in Figure 3-4. One will note that the annual percentage for KCP&L MO tails off more dramatically than for KCP&L GMO due to GMO's having a higher forecast customer growth rate, lending more opportunities for savings in new building stock in GMO's service area than in KCP&L MO's service area.

Figure 3-4. Incremental RAP as a % of Baseline Forecast Energy Sales – KCP&L MO

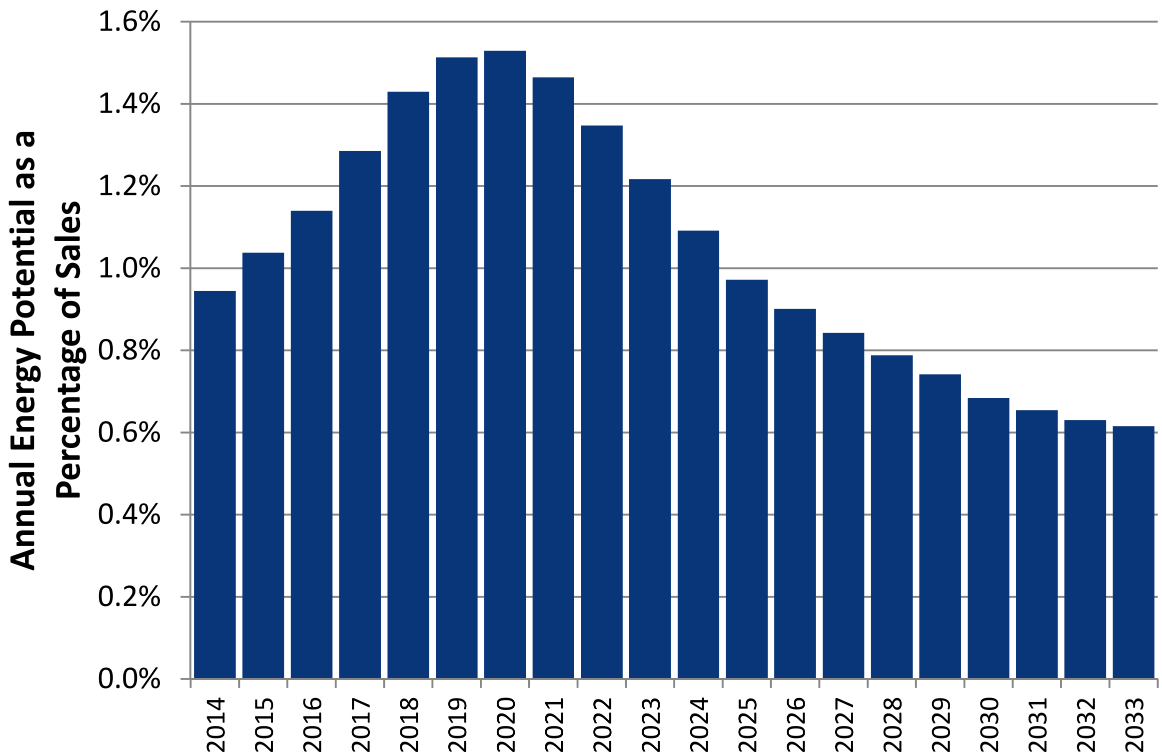


Table 3-5 shows the results described above expressed in absolute savings potential (in MWh), rather than as a percentage of baseline forecast energy sales.

Table 3-5. Cumulative Energy Savings (MWh) – KCP&L MO

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	3,581,027	2,501,491	83,217	103,809
2015	3,524,940	2,464,568	175,255	222,681
2016	3,579,226	2,514,060	277,039	358,190
2017	3,630,483	2,560,346	392,661	515,413
2018	3,684,404	2,608,862	522,323	692,514
2019	3,738,378	2,680,433	660,805	881,699
2020	3,786,858	2,723,815	801,979	1,075,116
2021	3,837,153	2,768,866	938,370	1,261,494
2022	3,885,410	2,857,765	1,064,988	1,435,067
2023	3,932,526	2,917,142	1,180,430	1,591,901
2024	3,983,472	2,980,930	1,284,982	1,733,479

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2025	4,036,927	3,029,471	1,379,080	1,860,562
2026	4,092,455	3,110,198	1,467,237	1,980,594
2027	4,153,604	3,236,336	1,550,686	2,096,715
2028	4,215,936	3,296,513	1,629,698	2,208,109
2029	4,280,483	3,356,160	1,704,979	2,315,369
2030	4,346,720	3,417,337	1,775,261	2,416,230
2031	4,409,916	3,476,352	1,843,326	2,513,709
2032	4,475,357	3,536,815	1,909,732	2,607,909
2033	4,543,031	3,599,358	1,975,390	2,699,565

Navigant also calculated the potential for reduction in coincident peak demand from energy efficiency measures, the results of which are illustrated below in Table 3-6.

Table 3-6. Cumulative Peak Demand Potential – KCP&L MO

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	976	615	19	26
2015	963	611	41	56
2016	974	621	65	92
2017	985	630	94	134
2018	997	640	127	181
2019	1,009	654	162	232
2020	1,020	664	198	285
2021	1,032	674	233	336
2022	1,043	716	266	384
2023	1,054	730	295	427
2024	1,066	741	320	466
2025	1,078	752	343	501
2026	1,091	773	364	534
2027	1,106	791	382	565
2028	1,120	805	400	594
2029	1,135	818	416	621
2030	1,151	832	432	647
2031	1,165	846	447	671
2032	1,181	860	461	693
2033	1,197	874	475	715

3.1.3 Aggregate Savings Potential – KCP&L KS

Figure 3-5 illustrates the potential for energy savings as a percentage of KCP&L KS's baseline energy forecast. As seen in this figure, technical potential represents roughly 42% of baseline energy sales over the 20-year forecast horizon, whereas economic potential ranges from about 26%-33% over the forecast horizon. Maximum achievable potential reaches 15.7% after 10 years (an average of 1.57%/year over the first 10 years of the forecast) and 23.8% by the year 2033. Realistic achievable potential is 11.5% of baseline energy sales by 2023 (or 1.15%/year for the first 10 years of the forecast) and 17.1% by 2033, which is roughly half the economic potential in that year. For additional discussion of the drivers of the shape of these curves, including "kinks" in the curve and the magnitude of achievable potential relative to economic potential, refer to the discussion in section 3.1.3, as the drivers are similar for each utility.

Figure 3-5. Cumulative Energy Savings as % of Baseline Forecast Sales - KCP&L KS

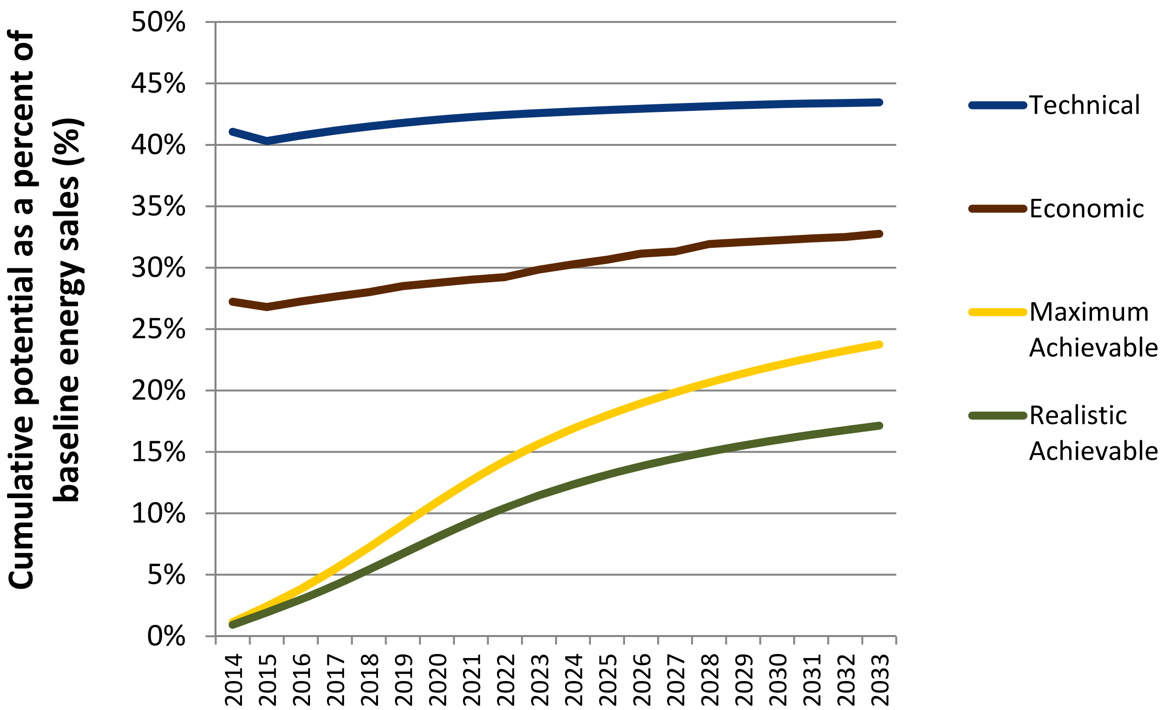


Table 3-7 provides the same information described in the figure above, but in tabular form.

Table 3-7. Cumulative Energy Savings as % of Baseline Forecast Sales - KCP&L KS

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	41.1%	27.2%	0.9%	1.1%
2015	40.3%	26.8%	1.9%	2.4%
2016	40.8%	27.3%	3.0%	3.8%
2017	41.2%	27.6%	4.1%	5.5%
2018	41.5%	28.0%	5.4%	7.2%
2019	41.8%	28.5%	6.7%	9.1%
2020	42.0%	28.8%	8.1%	10.9%
2021	42.3%	29.0%	9.3%	12.7%
2022	42.4%	29.2%	10.4%	14.3%
2023	42.6%	29.8%	11.5%	15.7%
2024	42.7%	30.3%	12.4%	16.9%
2025	42.8%	30.6%	13.1%	18.0%
2026	42.9%	31.1%	13.8%	19.0%
2027	43.1%	31.3%	14.5%	19.8%
2028	43.1%	31.9%	15.0%	20.6%
2029	43.2%	32.1%	15.5%	21.4%
2030	43.3%	32.2%	16.0%	22.1%
2031	43.4%	32.4%	16.4%	22.7%
2032	43.4%	32.5%	16.8%	23.2%
2033	43.5%	32.8%	17.1%	23.8%

As with KCP&L GMO and KCP&L MO, we provide for KCP&L KS the annual incremental realistic achievable potential as a percentage of baseline forecast energy sales in Figure 3-6. One will note that the annual percentage for KCP&L KS tails off more dramatically than for KCP&L GMO due to GMO's having a higher forecast customer growth rate, lending more opportunities for savings in new building stock in GMO's service area than in KCP&L KS's service area.

Figure 3-6. Incremental RAP as a % of Baseline Forecast Energy Sales – KCP&L KS

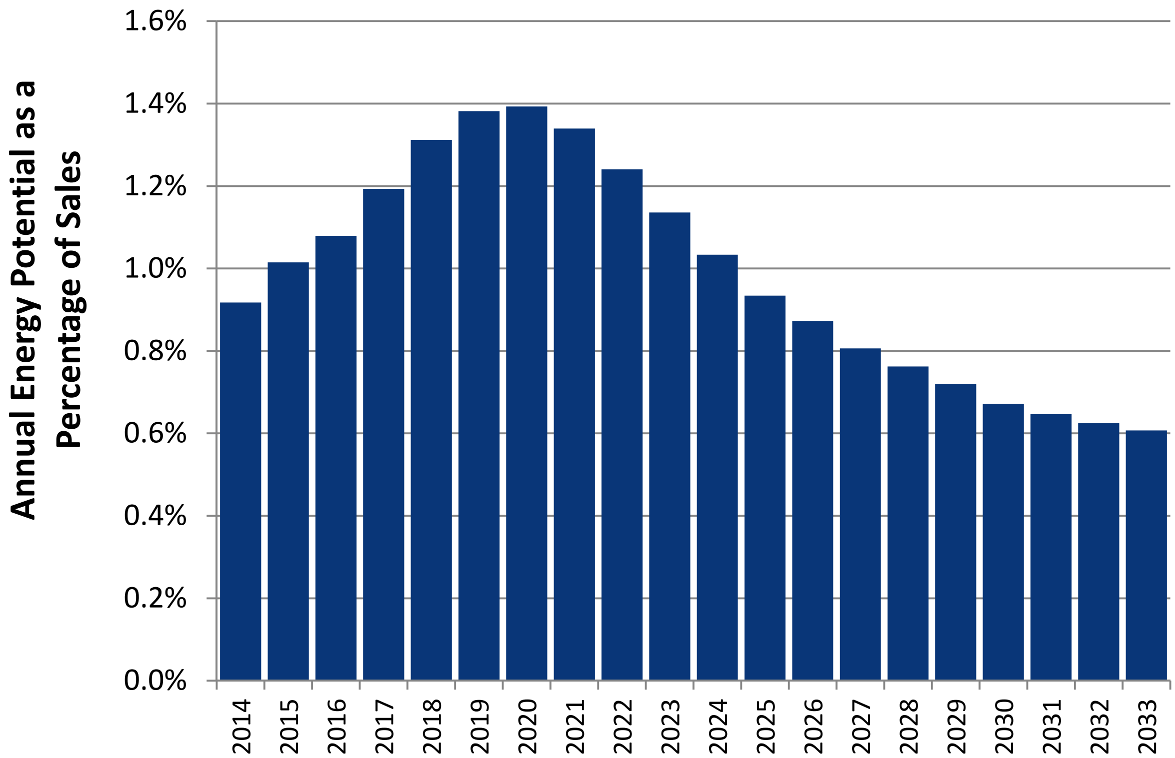


Table 3-8 shows the results described above expressed in absolute savings potential (in MWh), rather than as a percentage of baseline forecast energy sales.

Table 3-8. Cumulative Energy Savings (MWh) – KCP&L KS

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	2,721,410	1,804,180	60,804	75,079
2015	2,700,880	1,795,794	128,797	162,511
2016	2,759,519	1,845,102	201,858	260,583
2017	2,812,774	1,889,418	283,429	373,070
2018	2,866,972	1,934,541	374,060	499,032
2019	2,920,690	1,991,280	470,598	633,542
2020	2,969,861	2,031,782	569,032	771,503
2021	3,019,936	2,073,275	664,736	905,533
2022	3,067,602	2,112,647	754,392	1,030,013
2023	3,112,399	2,181,514	837,423	1,145,041
2024	3,159,916	2,239,795	913,897	1,250,737
2025	3,208,476	2,295,653	983,873	1,347,196
2026	3,258,312	2,362,886	1,050,099	1,439,352
2027	3,311,738	2,409,134	1,112,106	1,526,001
2028	3,365,596	2,491,169	1,171,573	1,610,665
2029	3,420,374	2,538,341	1,228,577	1,692,504
2030	3,476,409	2,586,670	1,282,500	1,770,291
2031	3,531,031	2,637,233	1,335,151	1,846,247

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2032	3,587,559	2,686,173	1,386,789	1,920,151
2033	3,645,948	2,747,654	1,437,728	1,992,450

Navigant also calculated the potential for reduction in coincident peak demand from energy efficiency measures, the results of which are illustrated below in Table 3-9.

Table 3-9. Cumulative Peak Demand Potential (MW) – KCP&L KS

Year	Technical	Economic	Realistic Achievable	Maximum Achievable
2014	764	450	14	19
2015	759	450	30	41
2016	772	460	47	67
2017	784	470	67	97
2018	796	479	90	131
2019	809	490	115	169
2020	821	499	140	207
2021	832	508	165	244
2022	844	517	189	279
2023	855	549	210	312
2024	866	558	229	341
2025	878	571	246	368
2026	890	589	262	393
2027	903	599	276	417
2028	915	612	289	439
2029	929	623	302	461
2030	942	634	314	481
2031	955	645	326	500
2032	968	656	337	518
2033	982	668	348	535

3.2 *Disaggregated Realistic Achievable Potential – Customer Segment*

Navigant modeled for each measure the savings potential by customer segment, as this was the level of aggregation of building stock calculations, as discussed in section 2.1.1. The savings by customer segment for the realistic achievable potential scenario is provided for each utility in Figure 3-7 through Figure 3-9. Residential single family homes offer the largest potential for energy savings for all three utilities. Including both limited income and non-limited income homes, residential single family homes account for 24%, 19%, and 30% of the realistic achievable potential by 2033 for KCP&L GMO, KCP&L MO, and KCP&L KS, respectively. We also note that to permit modeling incentive levels separately for customers in the limited income program, the limited income customer segment was further subdivided into those participating in the LI Weatherization program and those assumed to participate via other residential programs.

Figure 3-7. Cumulative RAP Energy Savings (MWh) by Customer Segment - KCP&L GMO

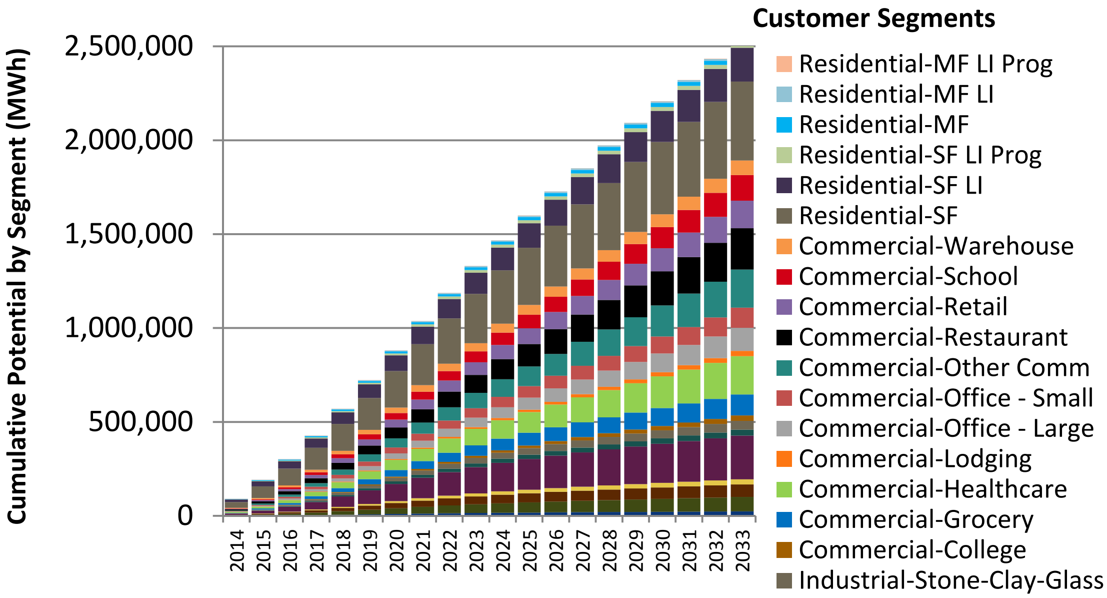


Figure 3-8. Cumulative RAP Energy Savings (MWh) by Customer Segment - KCP&L MO

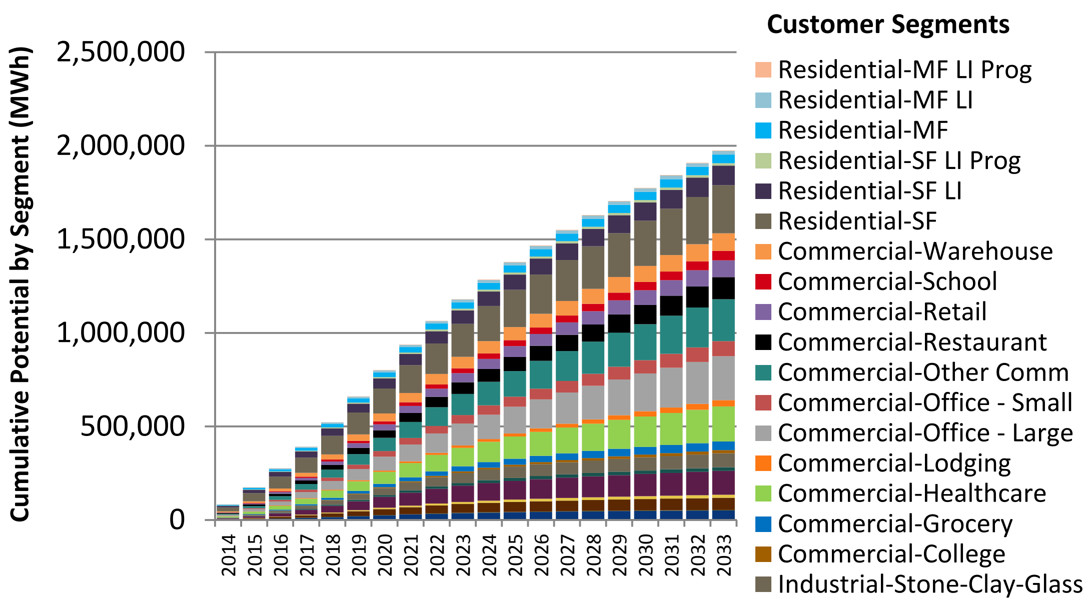
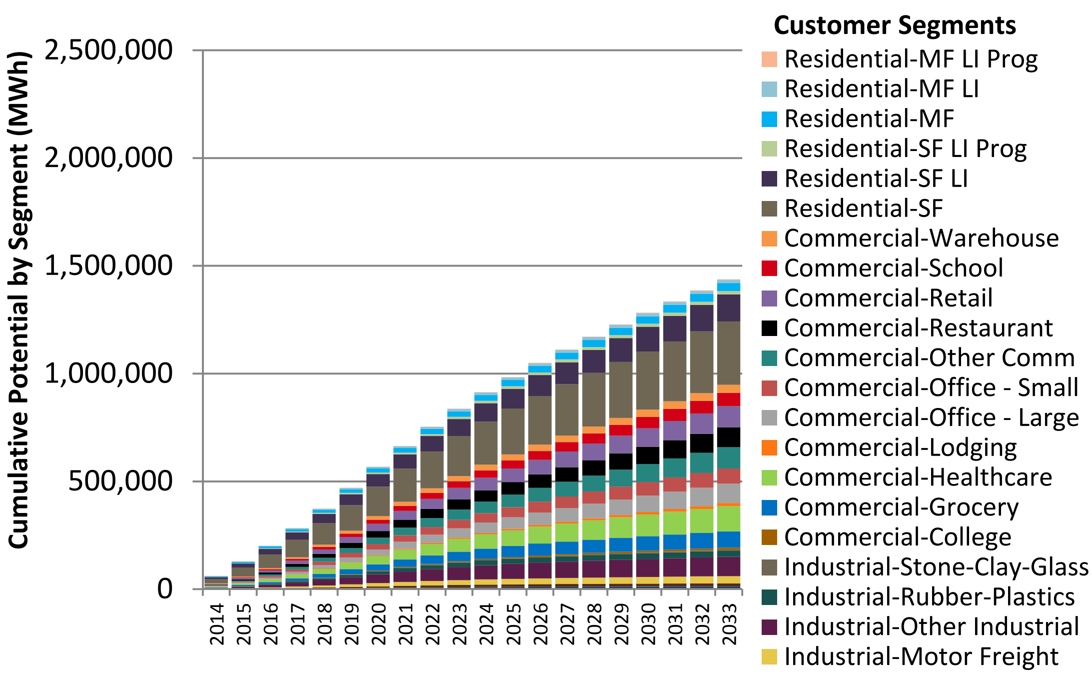


Figure 3-9. Cumulative RAP Energy Savings (MWh) by Customer Segment - KCP&L KS



3.3 Disaggregated Realistic Achievable Potential – End Use Category

Navigant aggregated savings potential, which is calculated at the measure and customer segment level, into eight end-use categories in Figure 3-10 through Figure 3-12. As seen in these figures, C&I HVAC/Shell/Whole Building measures provide the largest savings opportunity by 2033, driven largely by new construction measures that reduce savings greater than 30% relative to a baseline building. This end use category accounts for between 25% and 32% of total realistic achievable potential over the 20-year forecast horizon. Residential and C&I Lighting still account for substantial savings notwithstanding new federal lighting standards that reduce opportunity relative to past achievement. Residential and C&I lighting combined account for between 28% and 30% of realistic achievable savings over the 20-year forecast horizon. Additional detail regarding which measures drive the savings results can be found in section 3.4 and in Appendix L.

Figure 3-10. Cumulative RAP Energy Savings (MWh) by End Use Category - KCP&L GMO

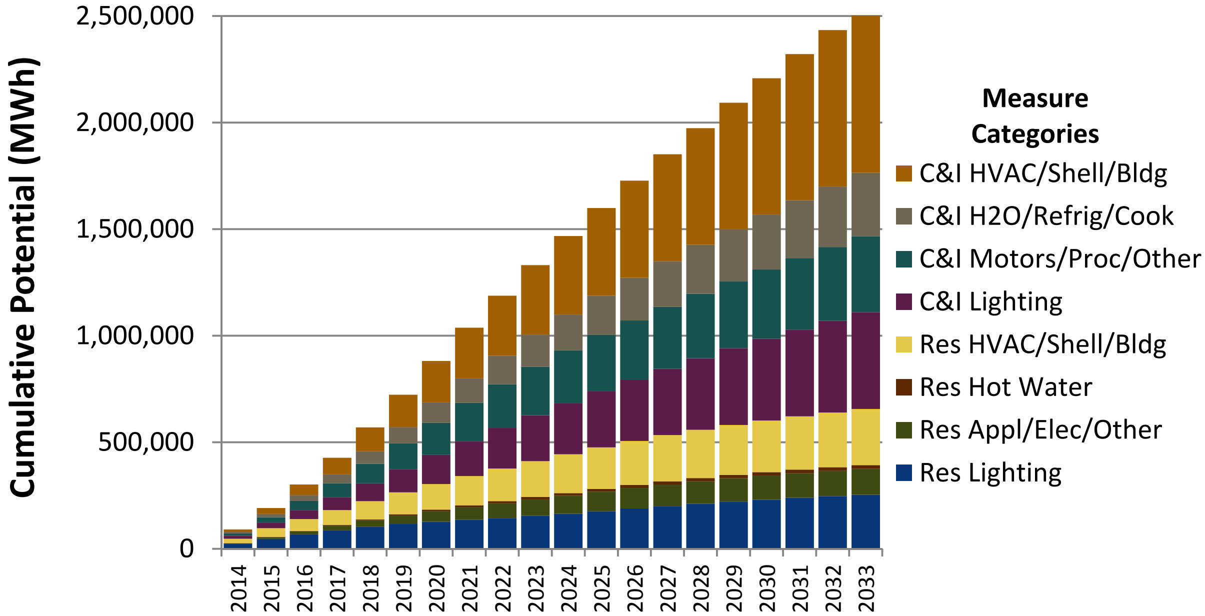


Figure 3-11. Cumulative RAP Energy Savings (MWh) by End Use Category - KCP&L MO

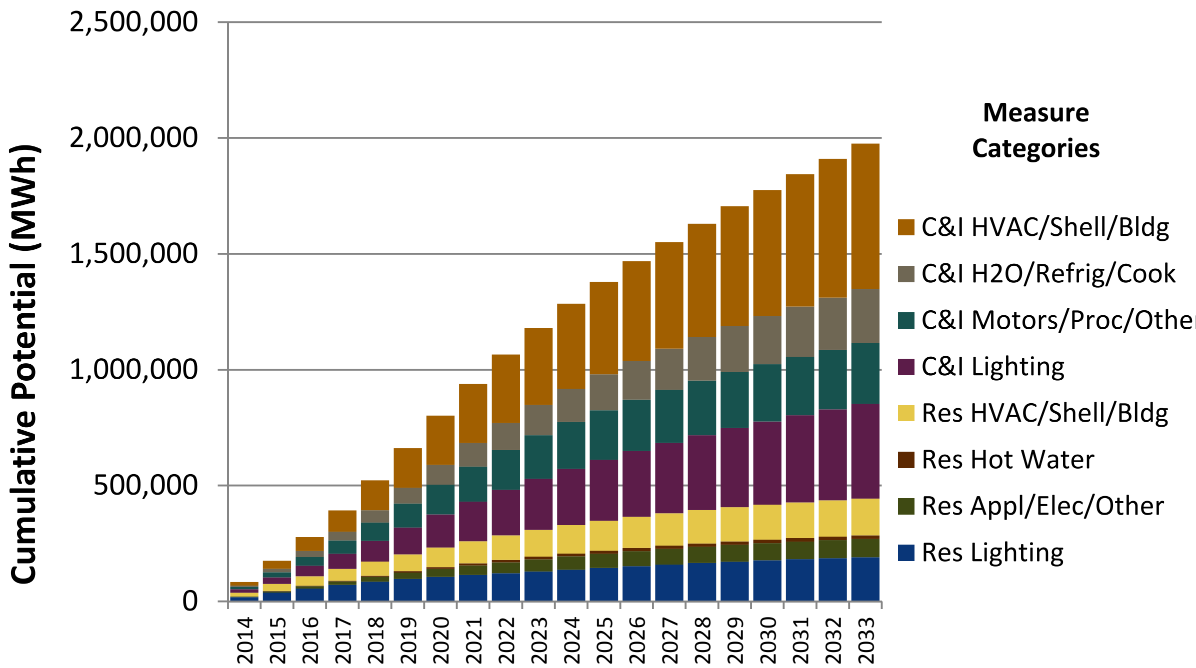
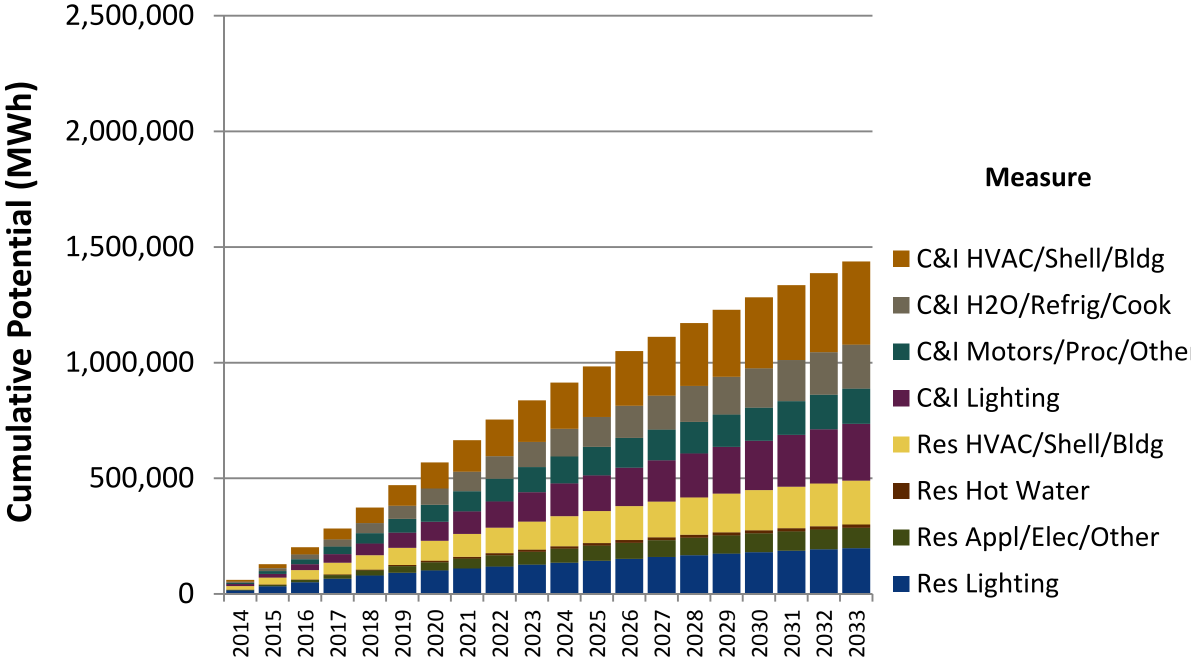


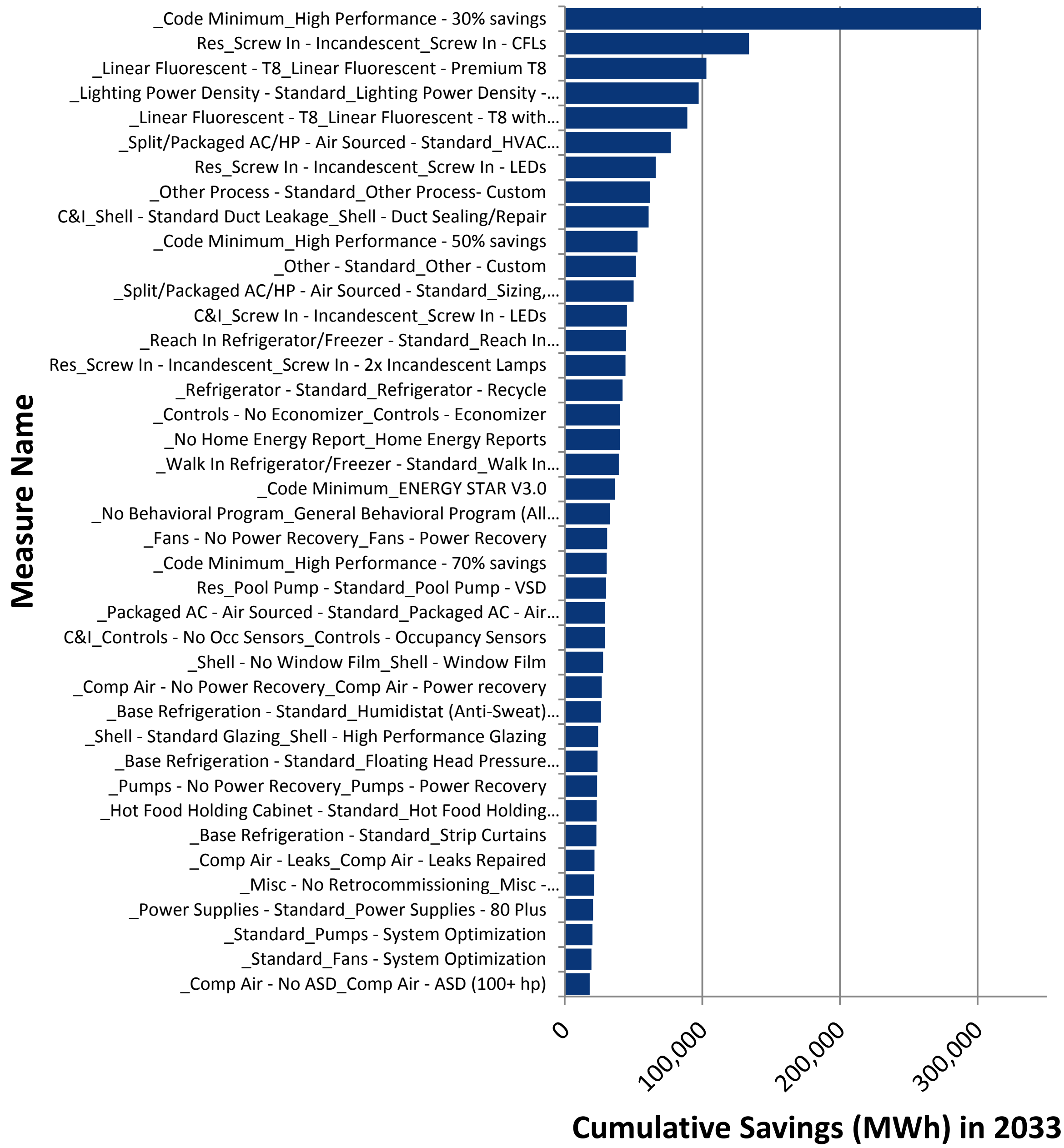
Figure 3-12. Cumulative RAP Energy Savings (MWh) by End Use Category - KCP&L KS



3.4 Histograms of Top 40 Measures

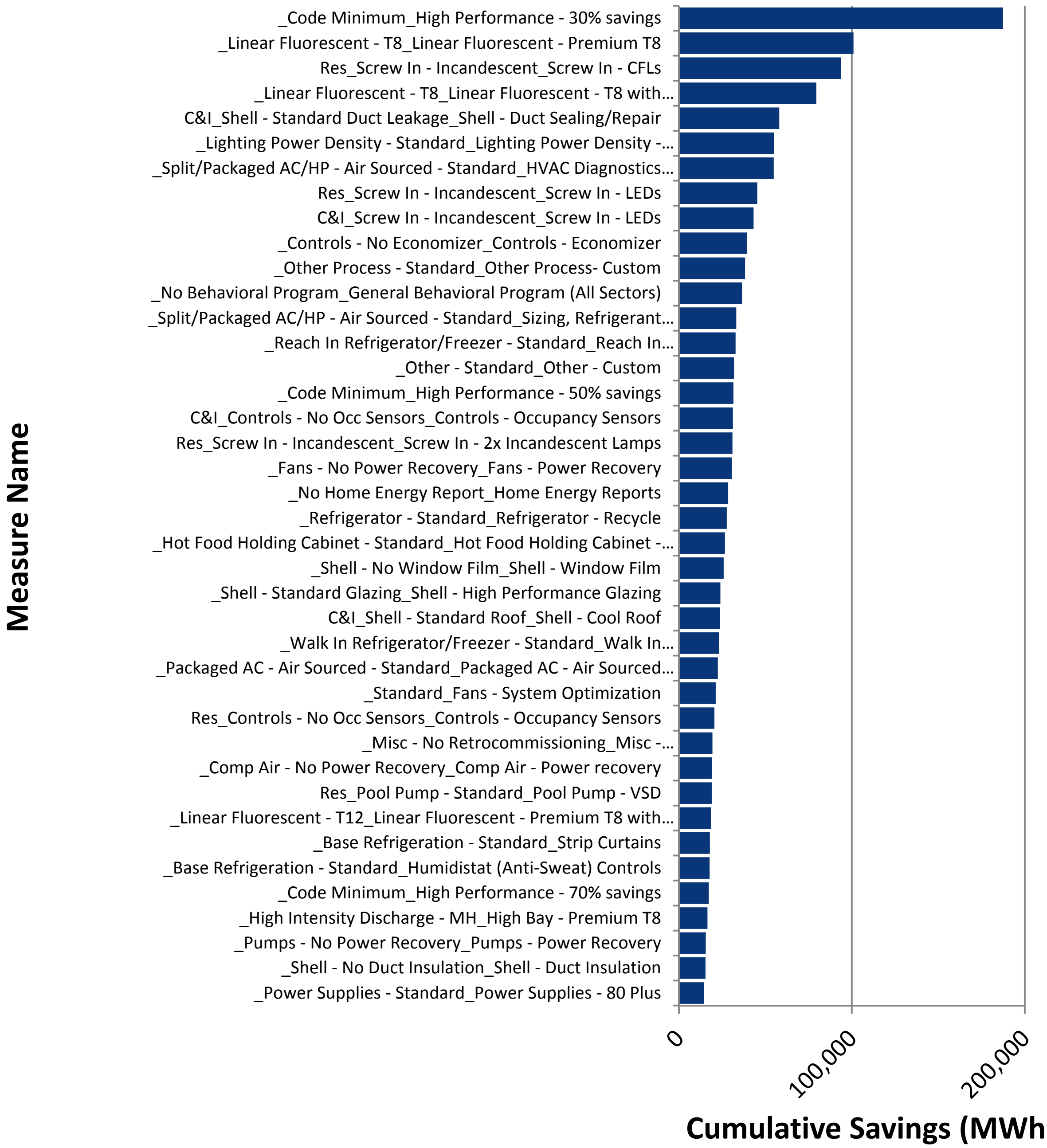
Often in potential studies, a small number of measures accounts for a larger percentage of total savings. We provide below in Figure 3-13 through Figure 3-15 a set of histograms for each utility showing the realistic achievable potential by 2033 of the top 40 measures in the portfolio. These measures represent 78%, 75%, and 79% of total achievable potential for KCP&L GMO, KCP&L MO, and KCP&L KS, respectively. For all utilities, the top 3 measures are a commercial new construction measure (30% savings relative to baseline), residential CFLs and Premium T8s (both of which continue to provide large savings at low cost notwithstanding EISA 2007 lighting standard changes). For GMO, the commercial new construction measure is larger on a relative basis than it is for KCP&L MO and KCP&L KS due to the larger forecast customer growth in that utility's service territory. Additional detail regarding measure-level output, including measure baseline and efficient technology assumptions, is provided in Appendix L and Appendix A.

Figure 3-13.Top 40 Measures[35] (Realistic Achievable Potential) by 2033 – KCP&L GMO



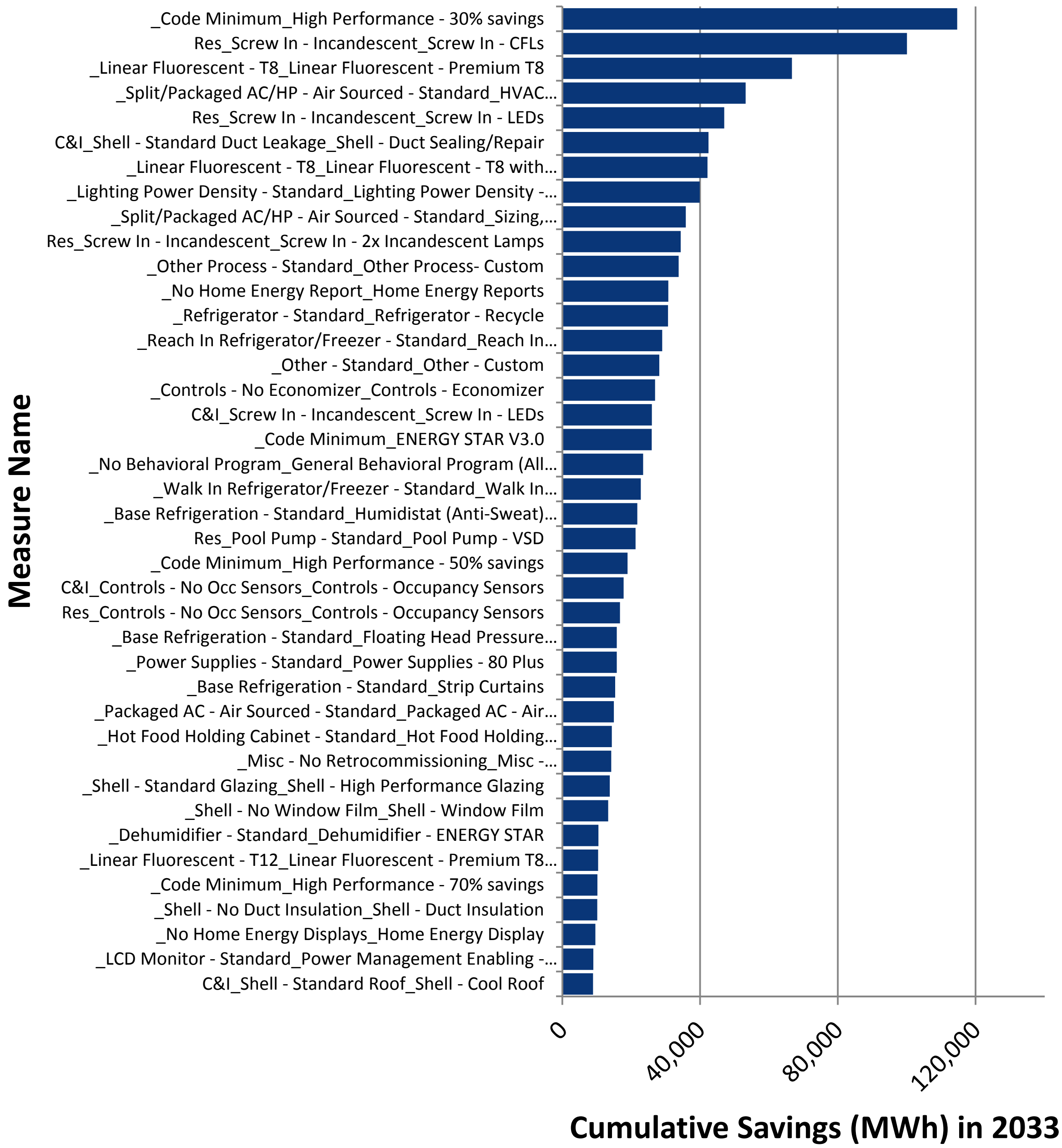
[35] Additional detail regarding measure-level output, including measure baseline and efficient technology assumptions, is provided in Appendix L and Appendix A.

Figure 3-14.Top 40 Measures[36] (Realistic Achievable Potential) by 2033 – KCP&L MO



[36] Additional detail regarding measure-level output, including measure baseline and efficient technology assumptions, is provided in Appendix L and Appendix A.

Figure 3-15. Top 40 measures[37] (Realistic Achievable Potential) by 2033 – KCP&L KS



3.5 *Disaggregated Realistic Achievable Potential – Program*

As part of this study, Navigant also developed a set of efficiency programs that are designed to deliver the savings in the realistic achievable potential scenario[38]. While the potential model is run at the level of the measure and customer segment, Navigant mapped measures and customer segments to programs, thereby allocating the realistic achievable potential to a suite of efficiency programs. The potential model

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[37] Additional detail regarding measure-level output, including measure baseline and efficient technology assumptions, is provided in Appendix L and Appendix A.
[38] Demand Response and CHP program descriptions will be provided separately to stakeholders for review.

is therefore effectively an integrated potential and program design model, as the results are internally consistent. Separate from this report, Navigant will be providing to the Companies a set of program design documents that can be used to guide implementation contractors in program execution. However, we include in this report a high-level discussion of the programs under development and summary results by program for context and since we estimated administrative costs at the program level.

Table 3-10. List of Programs[39] and Brief Descriptions

Program Name	High Level Program Description
C&I Custom Rebates	The C&I Custom Rebates Program is designed to encourage and assist nonresidential customers to improve the energy efficiency of their existing facilities through a broad range of energy efficiency options that address all major end uses and processes. The program offers incentives to customers who install high-efficiency electric equipment and engages equipment suppliers and contractors to promote the incentive-eligible equipment. The program is designed for retrofit and replacement projects and offers financial incentives, paid on a fixed kWh basis, based on the project's first year energy savings.
C&I Prescriptive Rebates	The Prescriptive Rebates Program is designed to encourage and assist nonresidential customers to improve the energy efficiency of their existing facilities through the installation of a broad range of energy efficiency options that address all major end uses and processes. The program offers rebates to customers who install high-efficiency equipment and engages equipment suppliers and contractors to promote the rebate-eligible equipment. The program is designed for retrofit and replacement projects and offers fixed, per-unit financial rebates.
C&I New Construction	The New Construction Program is designed to capture energy efficiency opportunities through a comprehensive effort to influence building design and construction practices. The program will work with design professionals and construction contractors to influence prospective building owners and developers to construct high- performance buildings that provide improved energy efficiency, systems performance, and comfort. Energy saving targets will be accomplished by stimulating incremental improvements of efficiency in lighting, HVAC and other building systems. The program will seek to capture synergistic energy savings by encouraging the design and construction of buildings as integrated systems.

[39] This list is for energy efficiency programs only. Five additional DR programs were also developed and are described at a high level in the Demand Response report, provided separately. Detailed program design information for EE, DR, and CHP is being promulgated separately.

Program Name	High Level Program Description
Small Business Direct Install (SBDI)	The SBDI program is designed to encourage and assist small business customers to improve the energy efficiency of their existing facilities through turn-key installation and rapid project completion. The program includes lighting, refrigeration, air-conditioning, water heating and control measures that are typically low-cost with reliable, prescriptive energy savings and costs per unit. The SBDI is designed to assist small business owners to overcome the barriers to achieving energy efficiency faced by small businesses. These include time constraints, capital constraints, lack of energy efficiency awareness, and lack of labor resources.
Building Operator Certification (BOC)	The BOC Program is a competency-based training and certification program for operations and maintenance staff working in commercial, institutional, or industrial buildings. Operators earn certification by attending training and completing project assignments in their facilities. BOC achieves energy savings by training individuals directly responsible for the maintenance of energy-using building equipment and day-to-day building operations.
Home Performance with ENERGY STAR	The HPwES Program will work to coordinate the development of a statewide network of independent contractors trained and mentored on the delivery of comprehensive energy analysis and measure installations under the Home Performance with ENERGY STAR model. The program will train contractors to Building Performance Institute (BPI) standards on building science and offer marketing and incentive packages to accelerate customer awareness and demand. Customers will pay a market-based fee for the analysis and will receive partial reimbursement when recommendations are implemented.
Low-Income Weatherization	The program will help facilitate the implementation of cost-effective electrical energy-savings measures in residential low-income households. In an ongoing effort, the utility company intends to work with the agencies responsible for implementing the federal LIHEAP program to leverage its funding, thereby increasing the number of homes served. If local weatherization agencies initially lack the resources to handle the additional workload, the implementation contractor will temporarily contract with private sector firms to address the overload.
Efficient Products	The Efficient Products Program promotes ENERGY STAR® appliances, lighting and home electronics. The program also promotes several products that are energy efficient, for which there are not yet ENERGY STAR labels, such as solid state lighting and light emitting diode technologies.
Multifamily Rebate	The Multifamily program offers property owners a comprehensive service for reducing energy use in the common areas of their building as well as helping residents reduce energy use in their living units. Property owners will be given the opportunity to participate in either or both components of the program.

Program Name	High Level Program Description
Cool Homes	The Cool Homes Program will influence the installation of high-efficiency heating, cooling and water heating technologies through a combination of market push and pull strategies that stimulate demand, while simultaneously increasing market provider investment in promoting high-efficiency products. The program will stimulate demand by educating customers about the energy and money-saving benefits associated with efficient equipment and providing financial incentives to overcome the first cost barrier. The program will stimulate market provider investment in stocking and promoting efficient products by offering HVAC contractors several services including training, educational materials, cooperative advertising and sales brochures.
Appliance Turn-In	The average household replaces a refrigerator (or freezer) every ten years. However, many of these refrigerators and freezers being replaced are still functioning and often end up as energy guzzling back-up appliances in basements and garages, or are sold in a used appliance market. The Appliance Turn-In Program will target these “second” refrigerators and freezers, providing the dual benefit of cutting energy consumption and keeping these appliances out of the used market. Units removed will be recycled and disabled through a certified recycling agency.
Home Energy Reports	The Home Energy Reports program provides residential customers with an energy report that provides an analysis of their household energy usage information along with comparison to similar customers or “neighbors.” The intention of the energy report is to provide information that will influence customers’ behavior in such a way that they lower their energy usage.
Energy Education	The Energy Education program provides curriculum, teacher training, and supplies for in-class instruction about how to use energy efficiently at home. The program will target students in the 5th through 8th grades, providing education and a “take-home” kit that raises awareness about how individual actions and low-cost measures can provide significant reductions in electricity and water consumption.
ENERGY STAR Homes	The ENERGY STAR Homes Program will recruit and educate selected builders and their trade allies on the benefits associated with building new homes to the ENERGY STAR standard. The program will provide education and rebates to inform and encourage architects, builders, and home buyers on the benefits of ENERGY STAR homes as well as requirements for gaining certification.

We provide the energy savings forecast for the realistic achievable potential scenario, disaggregated by program, in Table 3-11 through Table 3-13.

Table 3-11. Cumulative Realistic Achievable Potential (MWh) by Program[40] – KCP&L GMO

KCPL-GMO	C&I Custom Rebates	Prescriptive Rebates	New Construction	SBDI	BOC	Home Perf. with ENERGY STAR	LI Weatherization	Efficient Products	Multifamily Rebate	Cool Homes	Appliance Turn-In	Energy Reports	Energy Education	ENERGY STAR Homes	TOTALS
2014	17,945	18,838	1,122	4,617	634	1,456	483	21,734	959	3,309	1,068	15,781	1,940	1,010	**90,895**
2015	42,017	39,296	3,191	8,506	1,799	3,335	1,249	45,270	1,937	8,377	3,020	27,633	3,893	2,203	**191,727**
2016	73,157	65,321	6,654	13,208	3,381	5,348	2,200	67,458	2,876	14,931	5,657	32,609	5,604	3,626	**302,033**
2017	111,695	97,618	12,122	18,890	5,374	7,496	3,239	88,567	3,803	22,947	8,960	34,642	7,127	5,307	**427,785**
2018	156,872	135,949	19,837	25,595	7,761	9,772	4,308	108,519	4,726	32,328	12,887	35,608	8,484	7,239	**569,884**
2019	206,599	178,381	29,400	32,993	10,452	12,110	5,365	126,766	5,633	42,757	17,273	36,184	9,646	9,385	**722,942**
2020	257,712	223,457	41,571	40,661	13,285	14,436	6,366	142,981	6,495	53,694	21,834	36,611	10,541	11,683	**881,328**
2021	306,825	268,719	56,004	48,128	16,069	16,704	7,258	157,941	7,324	64,466	26,230	36,973	11,205	14,102	**1,037,947**
2022	351,343	312,628	72,825	55,055	18,634	18,900	8,033	172,293	8,134	74,479	30,167	37,298	11,629	16,492	**1,187,910**
2023	390,044	354,848	92,405	61,294	20,882	21,038	8,697	187,405	8,950	83,412	33,469	37,595	11,938	18,961	**1,330,940**
2024	423,399	395,370	115,208	66,879	22,796	23,906	9,259	202,271	9,719	91,169	36,102	37,878	12,190	21,554	**1,467,700**
2025	451,914	434,188	140,695	71,901	24,414	26,534	9,734	218,383	10,901	97,805	38,135	38,154	12,393	24,230	**1,599,381**
2026	476,743	472,460	169,856	76,540	25,802	28,896	10,163	233,893	11,947	103,695	39,681	38,428	12,557	27,005	**1,727,665**
2027	499,014	509,707	200,826	80,871	27,025	30,984	10,553	248,522	12,866	108,799	40,856	38,700	12,690	29,800	**1,851,215**
2028	520,561	546,668	234,353	85,047	28,135	32,793	10,908	262,102	13,671	113,228	41,762	38,968	12,802	32,567	**1,973,566**
2029	540,864	583,186	269,544	89,090	29,173	34,353	11,230	274,602	14,380	117,102	42,475	39,230	12,899	35,324	**2,093,452**
2030	560,259	618,228	304,123	92,976	30,163	35,704	11,523	286,034	15,009	120,527	43,052	39,486	12,988	38,075	**2,208,148**
2031	578,880	653,025	339,957	96,790	31,115	36,894	11,791	296,473	15,573	123,719	43,535	39,740	13,073	40,854	**2,321,418**
2032	597,000	687,864	377,219	100,571	32,044	37,966	12,036	306,024	16,083	126,649	43,954	39,993	13,160	43,688	**2,434,251**
2033	615,385	723,095	416,240	104,359	32,909	38,942	12,261	314,748	16,545	129,344	44,311	40,120	13,251	46,569	**2,548,082**

[40] Data for CHP savings can be found in section 4 of the report. Data for DR can be found in the "Demand-Response" report, provided separately, a summary of which is provided in Section 5. Compiled data and tables for EE, DR and CHP can be found in Section 5, with additional disaggregation provided in Appendix L.

Table 3-12. Cumulative Realistic Achievable Potential (MWh) by Program[41] – KCP&L MO

KCPL-MO	C&I Custom Rebates	Prescriptive Rebates	New Construction	SBDI	BOC	Home Perf. with ENERGY STAR	LI Weatherization	Efficient Products	Multifamily Rebate	Cool Homes	Appliance Turn-In	Energy Reports	Energy Education	ENERGY STAR Homes	TOTALS
2014	18,656	20,139	2,001	4,570	834	987	355	14,904	2,212	2,438	788	12,651	2,453	229	**83,217**
2015	42,772	41,591	4,758	8,578	2,356	2,295	937	31,530	4,711	6,226	2,219	21,980	4,831	470	**175,255**
2016	73,143	68,816	8,628	13,556	4,409	3,694	1,660	47,247	7,301	11,121	4,138	25,734	6,861	729	**277,039**
2017	109,967	101,945	14,054	19,451	6,979	5,182	2,449	62,226	10,024	17,106	6,528	27,117	8,622	1,011	**392,661**
2018	152,431	140,744	20,914	26,341	10,034	6,752	3,258	76,399	12,884	24,105	9,353	27,644	10,153	1,313	**522,323**
2019	198,471	183,450	28,676	33,904	13,447	8,354	4,056	89,365	15,810	31,857	12,483	27,864	11,439	1,628	**660,805**
2020	245,040	228,138	37,939	41,662	16,995	9,935	4,809	100,846	18,664	39,931	15,703	27,972	12,394	1,951	**801,979**
2021	288,885	272,185	48,237	49,096	20,419	11,459	5,475	111,315	21,371	47,788	18,761	28,038	13,065	2,278	**938,370**
2022	327,538	313,846	59,665	55,828	23,492	12,917	6,048	121,229	23,887	54,963	21,439	28,088	13,458	2,589	**1,064,988**
2023	359,905	352,308	72,383	61,685	26,087	14,313	6,531	131,433	26,210	61,206	23,618	28,131	13,714	2,905	**1,180,430**
2024	386,173	388,058	86,819	66,702	28,186	15,548	6,928	141,268	28,233	66,465	25,285	28,171	13,912	3,235	**1,284,982**
2025	407,283	420,953	102,337	70,990	29,848	16,631	7,252	150,651	29,979	70,814	26,500	28,209	14,059	3,573	**1,379,080**
2026	424,605	452,064	119,736	74,743	31,168	18,258	7,536	159,530	31,492	74,407	27,358	28,248	14,167	3,923	**1,467,237**
2027	440,657	481,403	137,969	78,083	32,239	19,725	7,790	167,842	32,816	77,402	27,953	28,288	14,245	4,274	**1,550,686**
2028	454,704	509,550	157,082	81,156	33,138	21,004	8,016	175,542	33,982	79,915	28,362	28,326	14,301	4,619	**1,629,698**
2029	467,278	536,613	176,839	84,022	33,921	22,096	8,216	182,609	35,017	82,049	28,645	28,364	14,344	4,964	**1,704,979**
2030	478,733	562,110	195,889	86,700	34,627	23,016	8,395	189,036	35,939	83,887	28,844	28,402	14,378	5,307	**1,775,261**
2031	489,282	586,940	215,607	89,261	35,278	23,794	8,552	194,837	36,764	85,521	28,986	28,440	14,407	5,657	**1,843,326**
2032	499,184	611,255	235,974	91,741	35,893	24,463	8,692	200,030	37,502	86,983	29,093	28,477	14,432	6,013	**1,909,732**
2033	508,660	635,344	257,281	94,175	36,453	25,039	8,815	204,651	38,163	88,308	29,172	28,496	14,457	6,379	**1,975,390**

[41] Data for CHP savings can be found in section 4 of the report. Data for DR can be found in the "Demand-Response" report, provided separately, a summary of which is provided in Section 5. Compiled data and tables for EE, DR and CHP can be found in Section 5, with additional disaggregation provided in Appendix L.

Table 3-13. Cumulative Realistic Achievable Potential (MWh) by Program[42] – KCP&L KS

KCPL-KS	C&I Custom Rebates	Prescriptive Rebates	New Construction	SBDI	BOC	Home Perf. with ENERGY STAR	LI Weatherization	Efficient Products	Multifamily Rebate	Cool Homes	Appliance Turn-In	Energy Reports	Energy Education	ENERGY STAR Homes	TOTALS
2014	9,775	12,580	749	2,916	530	924	309	13,920	1,518	2,252	774	12,034	1,840	682	**60,804**
2015	22,745	26,294	1,797	5,606	1,500	2,199	866	30,308	3,290	5,707	2,191	21,074	3,750	1,472	**128,797**
2016	39,377	43,697	3,365	9,044	2,808	3,590	1,580	46,243	5,160	10,174	4,103	24,869	5,447	2,401	**201,858**
2017	59,791	64,935	5,734	13,131	4,447	5,085	2,375	61,774	7,146	15,636	6,498	26,417	6,965	3,496	**283,429**
2018	83,519	89,814	8,938	17,908	6,396	6,673	3,203	76,739	9,249	22,049	9,346	27,151	8,318	4,757	**374,060**
2019	109,392	117,272	12,818	23,166	8,576	8,305	4,031	90,667	11,414	29,198	12,527	27,588	9,480	6,165	**470,598**
2020	135,678	146,156	17,716	28,577	10,846	9,926	4,823	103,235	13,546	36,716	15,834	27,912	10,375	7,693	**569,032**
2021	160,526	174,749	23,380	33,781	13,040	11,507	5,534	114,906	15,598	44,139	19,022	28,189	11,039	9,326	**664,736**
2022	182,520	201,939	29,849	38,513	15,015	13,035	6,154	126,044	17,539	51,048	21,877	28,440	11,469	10,950	**754,392**
2023	201,020	227,249	37,268	42,652	16,689	14,512	6,688	137,386	19,362	57,226	24,272	28,672	11,762	12,663	**837,423**
2024	216,301	250,861	45,830	46,217	18,049	15,852	7,142	148,456	20,997	62,608	26,185	28,896	12,005	14,498	**913,897**
2025	228,679	272,737	55,225	49,281	19,132	17,056	7,523	159,149	22,453	67,231	27,665	29,119	12,203	16,418	**983,873**
2026	238,811	293,537	65,852	51,973	19,995	18,727	7,864	169,428	23,758	71,211	28,794	29,344	12,368	18,437	**1,050,099**
2027	247,325	313,231	77,022	54,375	20,699	20,266	8,175	179,179	24,934	74,674	29,659	29,570	12,505	20,492	**1,112,106**
2028	255,093	332,280	88,889	56,603	21,291	21,644	8,457	188,326	25,997	77,702	30,332	29,794	12,621	22,541	**1,171,573**
2029	262,070	350,685	101,343	58,684	21,808	22,856	8,715	196,866	26,966	80,379	30,868	30,015	12,725	24,598	**1,228,577**
2030	268,487	368,145	113,629	60,631	22,274	23,912	8,951	204,813	27,852	82,778	31,307	30,233	12,822	26,666	**1,282,500**
2031	274,479	385,233	126,468	62,499	22,705	24,841	9,167	212,206	28,669	85,062	31,681	30,449	12,917	28,776	**1,335,151**
2032	280,189	402,039	139,821	64,312	23,114	25,670	9,366	219,044	29,427	87,189	32,010	30,667	13,011	30,930	**1,386,789**
2033	285,930	418,620	153,631	66,087	23,488	26,415	9,550	225,379	30,126	89,178	32,293	30,776	13,110	33,143	**1,437,728**

[42] Data for CHP savings can be found in section 4 of the report. Data for DR can be found in the "Demand-Response" report, provided separately, a summary of which is provided in Section 5. Compiled data and tables for EE, DR and CHP can be found in Section 5, with additional disaggregation provided in Appendix L.

3.6 Estimated Energy Efficiency Program Costs

This section provides the cumulative budget, by program, for all three utilities for the realistic achievable potential (RAP) scenario. The cumulative budgets for the maximum achievable potential (MAP) scenario and for scenarios between RAP and MAP, are provided in section 3.8.1.

Table 3-14 through Table 3-16 provide a breakdown, by program, of the forecast cumulative budget from 2014 through 2033. The budget values include incentive costs, non-incentive costs (i.e., program administration), and evaluation, measurement and verification (EM&V) costs. Assumptions regarding non-incentive costs and EM&V costs are provided in section 3.7.1. Budgets over the 20-year forecast horizon range for $445 million to $806 million depending on the utility. The 10-year average annual budget for each utility is $34.4 million, $29.5 million, and $21.4 million for KCP&L GMO, KCP&L MO, and KCP&L KS, respectively.

The budgets below combined with the forecast savings shown previously results in a cost of savings that ranges from $0.19/first-year kWh to $0.20/first-year kWh over the first five years of the program, with roughly 53-55% of that cost coming from incentives, 40-42% from program administrative costs, and 5% from EM&V. Additional detail regarding the budget breakdown, by program, will be provided to the Companies in separate program design documents.

Table 3-14. Cumulative Budget – KCP&L GMO

KCPL-GMO	C&I Custom Rebates	Prescriptive Rebates	New Construction	SBDI	BOC	Home Perf. with ENERGY STAR	LI Weatherization	Efficient Products	Multifamily Rebate	Cool Homes	Appliance Turn-In	Energy Reports	Energy Education	ENERGY STAR Homes	TOTALS
2014	$ 3,687,097	$ 3,257,843	$ 352,091	$ 1,307,320	$ 81,988	$ 370,487	$ 559,678	$ 1,923,416	$ 164,628	$ 869,342	$ 447,448	$ 687,379	$ 286,864	$ 770,242	**$ 14,765,823**
2015	$ 8,752,869	$ 7,148,559	$ 1,016,606	$ 2,643,525	$ 236,063	$ 901,039	$ 1,466,258	$ 4,178,594	$ 353,677	$ 2,080,922	$ 1,284,099	$ 1,918,644	$ 606,621	$ 1,690,406	**$ 34,277,882**
2016	$ 15,463,804	$ 12,321,313	$ 2,154,568	$ 4,376,674	$ 449,993	$ 1,501,007	$ 2,644,335	$ 6,422,683	$ 544,164	$ 3,624,154	$ 2,439,479	$ 3,405,089	$ 895,090	$ 2,799,762	**$ 59,042,115**
2017	$ 23,968,464	$ 18,903,665	$ 3,992,541	$ 6,556,682	$ 725,733	$ 2,172,680	$ 4,052,839	$ 8,679,580	$ 739,798	$ 5,511,885	$ 3,919,941	$ 5,020,483	$ 1,159,310	$ 4,124,656	**$ 89,528,258**
2018	$ 34,184,255	$ 26,880,241	$ 6,644,918	$ 9,199,663	$ 1,063,586	$ 2,917,221	$ 5,658,016	$ 10,937,583	$ 941,985	$ 7,737,796	$ 5,720,718	$ 6,719,122	$ 1,401,969	$ 5,665,584	**$ 125,672,657**
2019	$ 45,720,482	$ 35,901,879	$ 10,009,353	$ 12,196,656	$ 1,453,198	$ 3,718,738	$ 7,401,966	$ 13,143,016	$ 1,148,263	$ 10,255,200	$ 7,778,090	$ 8,484,959	$ 1,616,207	$ 7,397,128	**$ 166,225,135**
2020	$ 57,907,363	$ 45,700,424	$ 14,393,477	$ 15,398,766	$ 1,872,919	$ 4,559,622	$ 9,192,598	$ 15,301,250	$ 1,355,776	$ 12,972,236	$ 9,966,538	$ 10,312,723	$ 1,787,264	$ 9,273,954	**$ 209,994,911**
2021	$ 69,946,516	$ 55,761,757	$ 19,716,852	$ 18,619,484	$ 2,294,741	$ 5,422,901	$ 10,917,463	$ 17,541,832	$ 1,568,098	$ 15,757,056	$ 12,124,363	$ 12,200,998	$ 1,918,794	$ 11,273,930	**$ 255,064,785**
2022	$ 81,178,183	$ 65,741,573	$ 26,073,792	$ 21,715,616	$ 2,692,377	$ 6,299,096	$ 12,490,837	$ 20,063,572	$ 1,792,351	$ 18,482,388	$ 14,100,603	$ 14,149,706	$ 2,006,821	$ 13,273,829	**$ 300,060,744**
2023	$ 91,241,281	$ 75,592,464	$ 33,658,028	$ 24,617,188	$ 3,048,913	$ 7,185,132	$ 13,864,516	$ 22,995,026	$ 2,032,335	$ 21,080,999	$ 15,796,397	$ 16,159,116	$ 2,073,272	$ 15,365,843	**$ 344,710,511**
2024	$ 100,192,298	$ 85,266,373	$ 42,714,811	$ 27,326,672	$ 3,359,347	$ 8,858,041	$ 15,024,776	$ 25,892,202	$ 2,262,585	$ 23,516,388	$ 17,180,055	$ 18,230,188	$ 2,128,691	$ 17,590,387	**$ 389,542,814**
2025	$ 108,079,363	$ 94,750,331	$ 53,096,640	$ 29,871,575	$ 3,627,934	$ 10,452,432	$ 15,987,242	$ 29,417,922	$ 2,572,542	$ 25,769,728	$ 18,272,617	$ 20,364,361	$ 2,174,021	$ 19,915,768	**$ 434,352,476**
2026	$ 115,156,503	$ 104,322,943	$ 65,278,767	$ 32,328,172	$ 3,863,452	$ 11,927,255	$ 16,798,106	$ 32,915,844	$ 2,860,356	$ 28,024,498	$ 19,122,252	$ 22,563,281	$ 2,211,376	$ 22,358,527	**$ 479,731,332**
2027	$ 121,696,209	$ 113,863,702	$ 78,550,249	$ 34,714,302	$ 4,075,914	$ 13,254,598	$ 17,485,876	$ 36,297,527	$ 3,125,317	$ 30,124,586	$ 19,783,506	$ 24,828,722	$ 2,242,350	$ 24,850,699	**$ 524,893,557**
2028	$ 128,228,644	$ 123,540,248	$ 93,295,495	$ 37,096,218	$ 4,273,228	$ 14,410,755	$ 18,074,303	$ 39,501,550	$ 3,368,109	$ 32,058,053	$ 20,304,627	$ 27,162,302	$ 2,268,618	$ 27,350,495	**$ 570,932,645**
2029	$ 134,525,627	$ 133,325,801	$ 109,164,883	$ 39,477,530	$ 4,461,875	$ 15,406,819	$ 18,584,446	$ 42,500,543	$ 3,591,010	$ 33,833,169	$ 20,724,177	$ 29,565,572	$ 2,291,898	$ 29,874,024	**$ 617,327,373**
2030	$ 140,680,096	$ 142,938,685	$ 125,153,684	$ 41,828,678	$ 4,645,901	$ 16,270,625	$ 19,032,153	$ 45,284,602	$ 3,796,231	$ 35,465,970	$ 21,071,759	$ 32,040,194	$ 2,313,462	$ 32,426,481	**$ 662,948,521**
2031	$ 146,737,281	$ 152,710,035	$ 142,135,958	$ 44,198,348	$ 4,826,930	$ 17,039,246	$ 19,430,536	$ 47,861,200	$ 3,986,209	$ 37,024,145	$ 21,369,412	$ 34,587,983	$ 2,334,463	$ 35,039,642	**$ 709,281,389**
2032	$ 152,794,935	$ 162,726,587	$ 160,232,433	$ 46,604,763	$ 5,007,787	$ 17,748,969	$ 19,789,659	$ 50,248,247	$ 4,163,006	$ 38,495,168	$ 21,633,677	$ 37,210,991	$ 2,356,294	$ 37,739,791	**$ 756,752,309**
2033	$ 159,130,356	$ 173,099,155	$ 179,648,526	$ 49,071,031	$ 5,180,049	$ 18,418,733	$ 20,115,326	$ 52,453,551	$ 4,326,833	$ 39,893,045	$ 21,863,611	$ 39,902,875	$ 2,379,378	$ 40,524,441	**$ 806,006,911**

Table 3-15. Cumulative Budget – KCP&L MO

KCPL-MO	C&I Custom Rebates	Prescriptive Rebates	New Construction	SBDI	BOC	Home Perf. with ENERGY STAR	LI Weatherization	Efficient Products	Multifamily Rebate	Cool Homes	Appliance Turn-In	Energy Reports	Energy Education	ENERGY STAR Homes	TOTALS
2014	$ 3,807,242	$ 3,477,480	$ 621,168	$ 1,315,101	$ 105,532	$ 243,323	$ 415,151	$ 1,373,991	$ 372,190	$ 612,190	$ 330,530	$ 581,526	$ 357,559	$ 176,801	**$ 13,789,783**
2015	$ 8,866,093	$ 7,495,576	$ 1,498,714	$ 2,703,622	$ 302,476	$ 602,782	$ 1,099,336	$ 3,063,941	$ 832,980	$ 1,478,595	$ 943,588	$ 1,615,131	$ 740,541	$ 365,180	**$ 31,608,553**
2016	$ 15,409,033	$ 12,806,361	$ 2,760,860	$ 4,534,736	$ 574,136	$ 1,008,753	$ 1,989,976	$ 4,786,069	$ 1,324,079	$ 2,582,628	$ 1,784,749	$ 2,853,091	$ 1,077,758	$ 570,117	**$ 54,062,346**
2017	$ 23,551,161	$ 19,443,075	$ 4,573,573	$ 6,801,421	$ 922,056	$ 1,461,060	$ 3,053,712	$ 6,556,972	$ 1,852,350	$ 3,935,813	$ 2,856,395	$ 4,187,550	$ 1,379,857	$ 795,499	**$ 81,370,496**
2018	$ 33,188,586	$ 27,374,643	$ 6,921,713	$ 9,523,336	$ 1,345,241	$ 1,959,271	$ 4,264,057	$ 8,364,444	$ 2,419,504	$ 5,535,579	$ 4,151,826	$ 5,579,279	$ 1,651,621	$ 1,038,971	**$ 113,318,072**
2019	$ 43,926,400	$ 36,286,333	$ 9,644,894	$ 12,590,574	$ 1,828,756	$ 2,491,866	$ 5,576,972	$ 10,159,592	$ 3,014,011	$ 7,343,139	$ 5,620,363	$ 7,014,333	$ 1,888,120	$ 1,296,789	**$ 148,682,142**
2020	$ 55,111,877	$ 45,816,474	$ 12,976,289	$ 15,829,026	$ 2,343,140	$ 3,046,462	$ 6,923,019	$ 11,923,032	$ 3,617,001	$ 9,286,795	$ 7,165,907	$ 8,488,072	$ 2,071,223	$ 1,563,723	**$ 186,162,040**
2021	$ 65,962,476	$ 55,420,783	$ 16,774,012	$ 19,032,479	$ 2,850,801	$ 3,610,028	$ 8,215,185	$ 13,714,008	$ 4,218,880	$ 11,260,893	$ 8,666,884	$ 9,999,289	$ 2,206,238	$ 1,837,885	**$ 223,769,842**
2022	$ 75,827,929	$ 64,710,389	$ 21,096,503	$ 22,039,291	$ 3,316,948	$ 4,177,096	$ 9,389,876	$ 15,649,307	$ 4,820,170	$ 13,168,090	$ 10,011,971	$ 11,548,027	$ 2,290,891	$ 2,101,853	**$ 260,148,340**
2023	$ 84,369,404	$ 73,490,077	$ 26,031,380	$ 24,765,608	$ 3,719,596	$ 4,742,421	$ 10,407,343	$ 17,791,321	$ 5,417,157	$ 14,951,498	$ 11,131,473	$ 13,134,782	$ 2,349,108	$ 2,373,865	**$ 294,675,034**
2024	$ 91,557,481	$ 81,888,800	$ 31,777,790	$ 27,211,380	$ 4,052,739	$ 5,256,675	$ 11,255,990	$ 19,841,175	$ 5,958,420	$ 16,588,052	$ 12,007,171	$ 14,760,318	$ 2,395,126	$ 2,661,346	**$ 327,212,462**
2025	$ 97,544,026	$ 89,813,331	$ 38,114,562	$ 29,409,146	$ 4,322,754	$ 5,719,992	$ 11,948,116	$ 21,811,532	$ 6,448,596	$ 18,069,962	$ 12,660,448	$ 16,425,538	$ 2,430,019	$ 2,959,150	**$ 357,677,173**
2026	$ 102,636,010	$ 97,504,616	$ 45,401,665	$ 31,436,137	$ 4,541,966	$ 6,783,085	$ 12,519,697	$ 23,723,454	$ 6,897,867	$ 19,411,222	$ 13,132,233	$ 18,131,405	$ 2,455,946	$ 3,272,353	**$ 387,847,657**
2027	$ 107,560,344	$ 104,944,100	$ 53,236,953	$ 33,331,281	$ 4,724,041	$ 7,775,848	$ 12,995,304	$ 25,560,767	$ 7,311,441	$ 20,630,329	$ 13,466,697	$ 19,878,926	$ 2,475,018	$ 3,590,151	**$ 417,481,200**
2028	$ 111,997,603	$ 112,250,073	$ 61,657,491	$ 35,153,860	$ 4,880,293	$ 8,658,089	$ 13,394,083	$ 27,308,535	$ 7,692,334	$ 21,732,548	$ 13,702,249	$ 21,669,093	$ 2,489,152	$ 3,907,191	**$ 446,492,594**
2029	$ 116,065,164	$ 119,443,587	$ 70,578,598	$ 36,924,101	$ 5,019,640	$ 9,415,013	$ 13,731,793	$ 28,954,893	$ 8,043,470	$ 22,730,875	$ 13,868,825	$ 23,502,900	$ 2,499,948	$ 4,227,784	**$ 475,006,592**
2030	$ 119,859,989	$ 126,381,245	$ 79,395,109	$ 38,634,984	$ 5,148,113	$ 10,053,208	$ 14,020,346	$ 30,490,806	$ 8,366,944	$ 23,639,347	$ 13,988,361	$ 25,381,376	$ 2,508,533	$ 4,550,930	**$ 502,419,291**
2031	$ 123,452,860	$ 133,301,428	$ 88,745,052	$ 40,325,546	$ 5,269,150	$ 10,594,725	$ 14,269,188	$ 31,911,483	$ 8,664,941	$ 24,482,014	$ 14,076,307	$ 27,305,589	$ 2,515,815	$ 4,885,230	**$ 529,799,330**
2032	$ 126,936,488	$ 140,244,756	$ 98,638,587	$ 42,008,046	$ 5,386,285	$ 11,065,628	$ 14,485,217	$ 33,213,192	$ 8,939,094	$ 25,265,942	$ 14,143,391	$ 29,276,665	$ 2,522,409	$ 5,229,967	**$ 557,355,666**
2033	$ 130,394,265	$ 147,294,190	$ 109,240,561	$ 43,699,312	$ 5,495,330	$ 11,478,786	$ 14,673,341	$ 34,397,451	$ 9,190,208	$ 26,004,591	$ 14,194,168	$ 31,294,415	$ 2,528,734	$ 5,589,417	**$ 585,474,768**

Table 3-16. Cumulative Budget -- KCP&L KS

KCPL-KS	C&I Custom Rebates	Prescriptive Rebates	New Construction	SBDI	BOC	Home Perf. with ENERGY STAR	LI Weatherization	Efficient Products	Multifamily Rebate	Cool Homes	Appliance Turn-In	Energy Reports	Energy Education	ENERGY STAR Homes	TOTALS
2014	$ 1,921,143	$ 2,171,776	$ 231,262	$ 838,727	$ 68,694	$ 233,412	$ 397,664	$ 1,290,286	$ 255,746	$ 587,709	$ 324,486	$ 542,076	$ 269,323	$ 522,474	**$ 9,654,778**
2015	$ 4,535,579	$ 4,720,413	$ 562,418	$ 1,755,853	$ 197,117	$ 586,470	$ 1,070,592	$ 2,948,010	$ 582,262	$ 1,409,214	$ 931,291	$ 1,513,168	$ 578,188	$ 1,134,375	**$ 22,524,951**
2016	$ 7,971,793	$ 8,079,707	$ 1,069,045	$ 2,994,837	$ 374,398	$ 991,116	$ 1,956,947	$ 4,672,270	$ 936,797	$ 2,456,513	$ 1,769,258	$ 2,685,520	$ 861,003	$ 1,862,242	**$ 38,681,446**
2017	$ 12,294,336	$ 12,289,374	$ 1,852,015	$ 4,534,968	$ 601,568	$ 1,445,679	$ 3,024,379	$ 6,473,221	$ 1,322,548	$ 3,736,838	$ 2,842,943	$ 3,959,487	$ 1,121,770	$ 2,729,244	**$ 58,228,372**
2018	$ 17,448,326	$ 17,325,987	$ 2,935,377	$ 6,387,172	$ 878,066	$ 1,949,231	$ 4,246,018	$ 8,333,689	$ 1,739,893	$ 5,254,568	$ 4,148,866	$ 5,298,977	$ 1,361,790	$ 3,738,990	**$ 81,046,951**
2019	$ 23,223,182	$ 23,002,508	$ 4,278,325	$ 8,480,669	$ 1,194,280	$ 2,490,641	$ 5,576,820	$ 10,201,846	$ 2,180,423	$ 6,980,372	$ 5,640,796	$ 6,691,326	$ 1,574,670	$ 4,880,909	**$ 106,396,767**
2020	$ 29,269,168	$ 29,106,459	$ 6,015,539	$ 10,700,466	$ 1,531,147	$ 3,058,217	$ 6,946,764	$ 12,058,592	$ 2,631,544	$ 8,853,093	$ 7,227,719	$ 8,132,425	$ 1,744,924	$ 6,133,626	**$ 133,409,682**
2021	$ 35,164,211	$ 35,285,040	$ 8,073,865	$ 12,906,177	$ 1,864,288	$ 3,641,523	$ 8,269,275	$ 13,968,534	$ 3,088,300	$ 10,781,228	$ 8,792,464	$ 9,621,275	$ 1,876,431	$ 7,489,870	**$ 160,822,478**
2022	$ 40,553,205	$ 41,293,735	$ 10,483,377	$ 14,988,221	$ 2,171,038	$ 4,234,417	$ 9,477,146	$ 16,040,402	$ 3,551,367	$ 12,672,072	$ 10,225,728	$ 11,157,950	$ 1,965,892	$ 8,855,102	**$ 187,669,652**
2023	$ 45,249,475	$ 47,019,080	$ 13,317,469	$ 16,890,182	$ 2,436,967	$ 4,834,009	$ 10,534,558	$ 18,331,986	$ 4,018,126	$ 14,480,247	$ 11,456,026	$ 12,742,782	$ 2,029,813	$ 10,313,739	**$ 213,654,458**
2024	$ 49,280,732	$ 52,502,385	$ 16,673,954	$ 18,609,474	$ 2,657,990	$ 5,397,124	$ 11,430,988	$ 20,561,864	$ 4,452,353	$ 16,181,208	$ 12,460,865	$ 14,376,745	$ 2,083,750	$ 11,896,522	**$ 238,565,953**
2025	$ 52,670,785	$ 57,709,653	$ 20,453,294	$ 20,165,630	$ 2,838,044	$ 5,922,710	$ 12,175,682	$ 22,738,894	$ 4,856,166	$ 17,761,482	$ 13,256,067	$ 16,061,209	$ 2,128,486	$ 13,573,524	**$ 262,311,627**
2026	$ 55,556,382	$ 62,788,526	$ 24,839,856	$ 21,608,776	$ 2,984,963	$ 6,970,263	$ 12,803,787	$ 24,887,269	$ 5,236,537	$ 19,230,267	$ 13,876,998	$ 17,797,691	$ 2,166,069	$ 15,359,910	**$ 286,107,291**
2027	$ 58,080,380	$ 67,720,856	$ 29,572,604	$ 22,962,203	$ 3,107,491	$ 7,973,676	$ 13,339,229	$ 26,980,497	$ 5,594,981	$ 20,602,098	$ 14,363,516	$ 19,587,801	$ 2,197,887	$ 17,203,143	**$ 309,286,362**
2028	$ 60,461,980	$ 72,599,294	$ 34,732,452	$ 24,273,650	$ 3,212,883	$ 8,891,545	$ 13,799,553	$ 28,996,746	$ 5,931,818	$ 21,875,074	$ 14,750,607	$ 21,432,982	$ 2,225,394	$ 19,064,976	**$ 332,248,956**
2029	$ 62,654,539	$ 77,427,991	$ 40,285,984	$ 25,549,158	$ 3,306,947	$ 9,706,545	$ 14,200,907	$ 30,926,241	$ 6,248,916	$ 23,059,061	$ 15,065,972	$ 23,334,579	$ 2,250,251	$ 20,958,967	**$ 354,976,057**
2030	$ 64,722,984	$ 82,118,924	$ 45,906,086	$ 26,785,042	$ 3,393,777	$ 10,420,698	$ 14,555,286	$ 32,764,073	$ 6,547,638	$ 24,166,270	$ 15,330,821	$ 25,294,023	$ 2,273,660	$ 22,888,208	**$ 377,167,489**
2031	$ 66,713,965	$ 86,821,716	$ 51,927,356	$ 28,009,292	$ 3,475,838	$ 11,052,907	$ 14,873,058	$ 34,509,536	$ 6,830,188	$ 25,248,796	$ 15,560,942	$ 27,312,883	$ 2,296,826	$ 24,883,934	**$ 399,517,238**
2032	$ 68,680,164	$ 91,560,966	$ 58,347,119	$ 29,230,877	$ 3,555,610	$ 11,626,469	$ 15,161,136	$ 36,154,874	$ 7,097,903	$ 26,288,556	$ 15,768,229	$ 29,392,932	$ 2,320,429	$ 26,949,848	**$ 422,135,114**
2033	$ 70,734,905	$ 96,352,561	$ 65,154,177	$ 30,456,040	$ 3,630,211	$ 12,153,822	$ 15,424,637	$ 37,704,634	$ 7,350,419	$ 27,296,757	$ 15,950,712	$ 31,528,419	$ 2,345,395	$ 29,102,280	**$ 445,184,970**

3.7 *Energy Efficiency Cost Effectiveness*

This section provides the results of cost-effectiveness analysis for the realistic achievable potential scenario. Section 3.7.1 provides key underlying assumptions, while section 3.7.2 provides cost-effectiveness results for energy efficiency programs. Results for CHP cost-effectiveness are provided in section 4, while demand response cost-effectiveness is provided in the stand-alone DR report entitled "Demand-Side Resource Potential Study Report – Demand Response," dated August 2013.

3.7.1 Key Cost Effectiveness Assumptions

[redacted]

[redacted]

[redacted]

[43]U.S. DOE EIA, website "Annual Energy Outlook 2011" http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2011&subject=8-AEO2011&table=72-AEO2011&region=0-0&cases=ref2011-d020911a. A 2.5% inflation rate was assumed.

Table 3-17. Avoided Cost Assumptions

Year	Avoided Energy Costs ($/kWh)				Avoided Demand Costs ($/kW-yr)	Avoided Therm Costs ($/therm)
	Summer On Peak	Summer Off Peak	Non Summer On Peak	Non Summer Off Peak		
2014	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2015	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2016	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2017	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2018	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2019	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2020	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2021	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2022	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2023	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2024	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2025	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2026	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2027	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2028	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2029	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2030	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2031	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2032	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**
2033	**[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]**

[redacted]

Table 3-18. Administrative Cost Assumptions

Program Name	$/first-year kWh
Custom Retrofit	**[redacted]**
Prescriptive Rebates	**[redacted]**
Custom NC	**[redacted]**
SBDI	**[redacted]**
BOC	**[redacted]**
Home Perf. w/ENERGY STAR	**[redacted]**
Low-Income Weatherization	**[redacted]**
Efficient Products	**[redacted]**
Multi-Family Rebates	**[redacted]**
HVAC & DHW	**[redacted]**
Appliance Turn-In	**[redacted]**
Energy Reports	**[redacted]**
Energy Education	**[redacted]**
ENERGY STAR New Homes	**[redacted]**

Finally, Navigant assumed the following discount rates in its analysis. For the Total Resource Cost test, Utility Cost test, and Ratepayer Impact Measurement test, Navigant used the after-tax weighted average cost of capital provided by the Companies, consistent with standard industry practice, the EPA's National Action Plan for Energy Efficiency (NAPEE)[44] (see Table 4-3 in that document), and KS Commission ORDER FOLLOWING COLLABORATIVE ON BENEFIT-COST TESTING AND EVALUATION, MEASUREMENT, AND VERIFICATION (Docket No. 08 -GIMX-442), dated April 13, 2009, Section 2.56. A lower discount rate of 3% is assumed for the Societal Cost test, while a 10% discount rate is assumed for the Participant Cost[45].

Table 3-19. Assumed Discount Rates

	KCP&L - KS	KCPL - MO	KCPL - GMO
Societal Cost Test	3%	3%	3%
Total Resource Cost Test	**[redacted]	[redacted]	[redacted]**
Utility Cost Test	**[redacted]	[redacted]	[redacted]**
Participant Cost Test	10%	10%	10%
Rate Impact Measure Test	**[redacted]	[redacted]	[redacted]**

3.7.2 Cost Effectiveness Results

This section provides the results of the five standard cost-effectiveness tests, calculated in a manner consistent with MO 4 CSR 240 used in evaluation of energy efficiency programs. As noted in section 2.3.1, the Total Resource Cost (TRC) test is used at the measure level to determine whether a measure falls into the Economic Potential subset, though we provide the results of all five cost-effectiveness tests below for stakeholders' information.

[44] Available at http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf

[45] Also consistent with guidance in the NAPEE report and KS Commission Order referenced previously.

Table 3-20. Portfolio Cost Effectiveness – KCP&L GMO

	2014	2015	2016	2017	2018
Societal Cost Test	2.1	2.2	2.3	2.4	2.5
Total Resource Cost Test	1.6	1.7	1.8	1.9	1.9
Utility Cost Test	2.4	2.5	2.7	2.9	3.1
Participant Cost Test	3.7	3.6	3.4	3.3	3.2
Rate Impact Measure Test	0.5	0.6	0.6	0.6	0.7

Table 3-21. Portfolio Cost Effectiveness -- KCP&L MO

	2014	2015	2016	2017	2018
Societal Cost Test	2.3	2.3	2.5	2.6	2.7
Total Resource Cost Test	1.7	1.7	1.8	1.9	2.0
Utility Cost Test	2.5	2.6	2.9	3.0	3.2
Participant Cost Test	3.3	3.2	3.1	3.0	2.9
Rate Impact Measure Test	0.6	0.6	0.7	0.7	0.8

Table 3-22. Portfolio Cost Effectiveness -- KCP&L KS

	2014	2015	2016	2017	2018
Societal Cost Test	2.1	2.2	2.3	2.4	2.5
Total Resource Cost Test	1.6	1.7	1.8	1.9	1.9
Utility Cost Test	2.3	2.4	2.6	2.8	2.9
Participant Cost Test	3.2	3.1	3.0	2.9	2.8
Rate Impact Measure Test	0.6	0.6	0.7	0.7	0.8

Additional cost-effectiveness results, by program, are offered to the Companies separately in the detailed program design documents and are also provided in Appendix L.

3.8 *Energy Efficiency Potential Supply Curves*

Navigant calculated two different types of supply curves as part of this study. The first set of supply curves illustrates how the cumulative budget increases as higher and higher levels of achievable potential are realized. These curves are provided in section 3.8.1. The second set of curves provide traditional supply curve results that plot the levelized cost of electric energy saved as a function of the cumulative MWh of energy saved.

3.8.1 Cumulative Budget versus Cumulative Achievable Potential

Although Navigant's statement of work and the MO 4 CSR 240 protocols call only for two scenarios of achievable potential (realistic and maximum), stakeholders indicated an interest in understanding how both costs and savings would vary between the RAP and MAP achievable potential scenarios. In an attempt to address this question at a high level, Navigant created what is effectively an achievable potential supply curve that shows the cumulative program budget (in 2033 and in 2023) as a function of the cumulative energy savings achieved (both in absolute MWh and as a percentage of baseline forecast energy sales). Navigant created this curve by adjusting incentive levels between RAP and MAP per the strategy outlined in section 2.3.3.

Figure 3-16 provides for all three utilities the cumulative program budget in 2033 as a function of the achievable energy savings potential (expressed as a percentage of baseline energy sales in 2033). The data point on the far left side of each curve represents the RAP scenario, whereas the far right data point on each curve represents the MAP scenario. As can be seen in these curves, costs begin to increase sharply at higher and higher levels of desired potential. For instance, targeting 25% savings by 2033 versus the RAP scenario of 18.5% for KCP&L MO increases the forecast cumulative budget by a factor of 3.9. Diminishing returns set in that require going after more costly measures at higher incentive levels for all measures, thereby resulting in a very expensive portfolio, especially in the case of the MAP scenario, where costs are up to 4-5 times greater than in the RAP scenario.

Figure 3-16. Cumulative Budget versus Cumulative Achievable Potential % of Sales – 2033

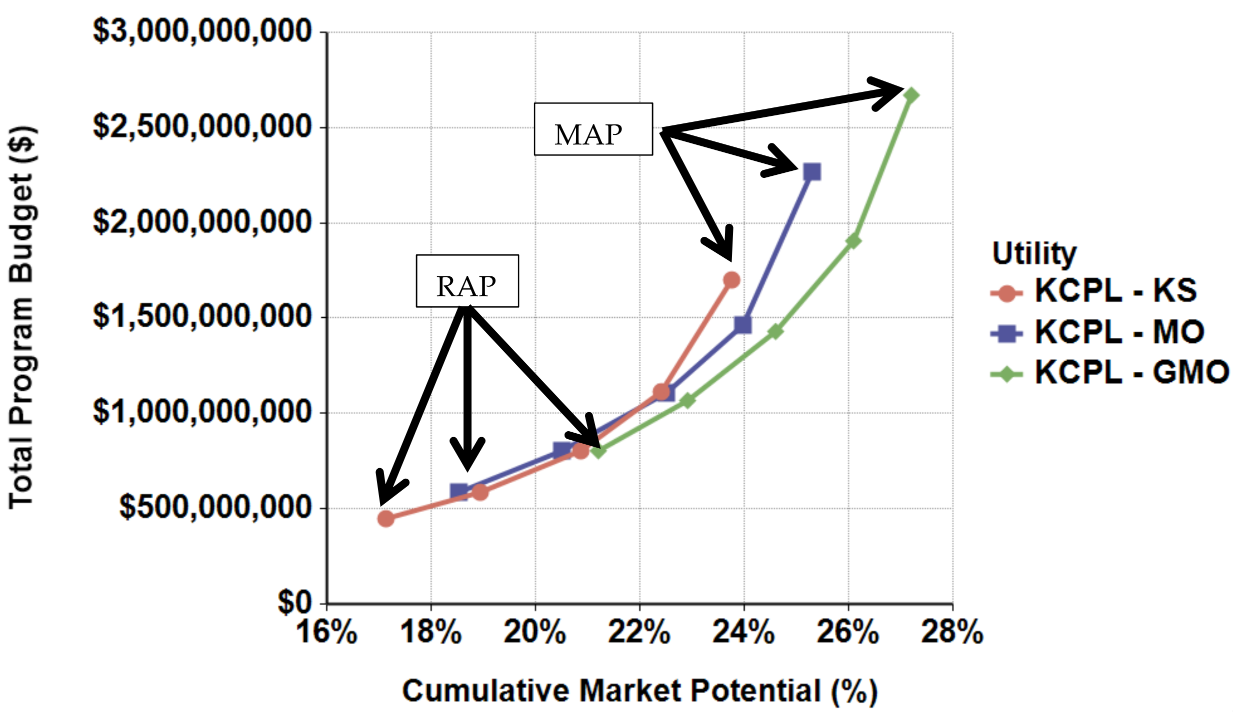
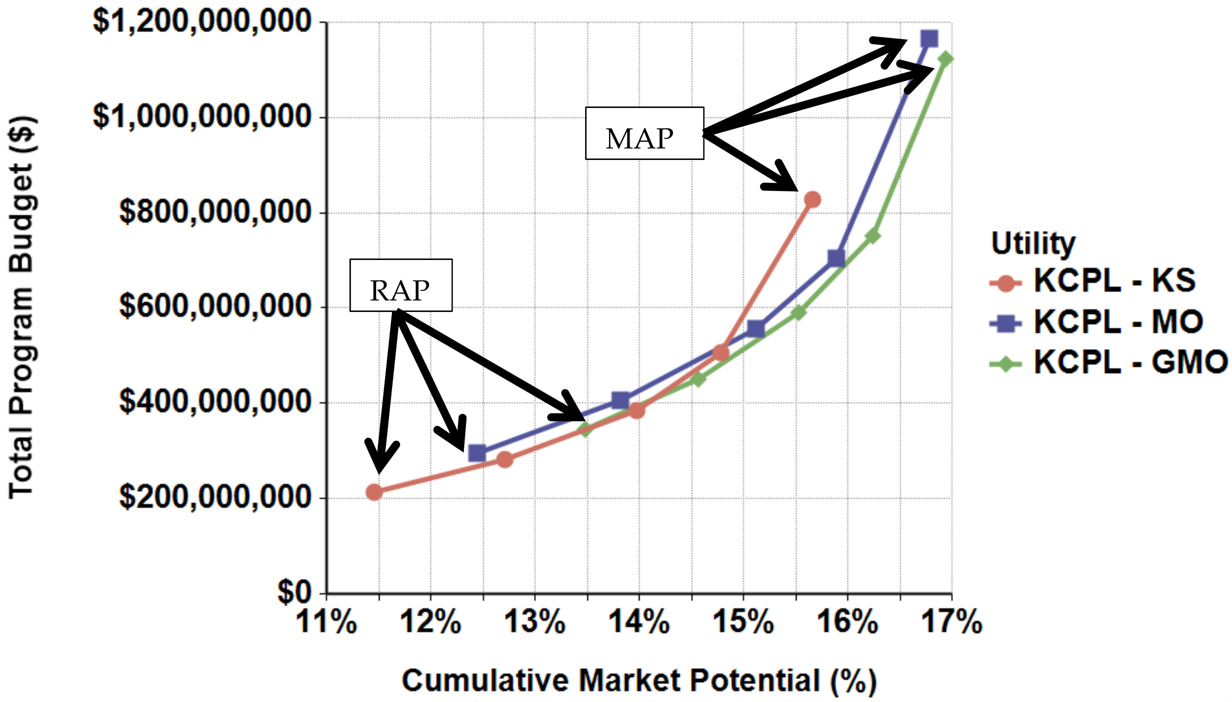


Figure 3-17 provides the same curve as that shown above except the 10-year potential is provided rather than the 20-year potential. The 10-year average potential (e.g., in %/year) is a useful metric for comparison with other studies and with savings achieved in other service territories. As can be seen in this figure, for instance, targeting an achievable savings potential of about 15.5% by 2023 (or 1.5%/year) for KCP&L MO is estimated to cost about $600,000,000 cumulative (or $60 million/year), which compares with an estimated cumulative cost of roughly $295,000,000 (or ~$29.5 million/year) for the RAP scenario of ~1.24%/yr.

Figure 3-17. Cumulative Budget versus Cumulative Achievable Potential % of Sales – 2023



3.8.2 Levelized Cost of Electricity versus Cumulative Energy Savings

Energy efficiency supply curves offer a useful way to illustrate the amount of energy savings per dollar spent. A supply curve typically consists of two axes – one that shows the cost per unit of saving (e.g., levelized cost per kWh saved) and one that captures the energy savings at each cost level. The curve is constructed using individual efficiency measures that are sorted on a least-cost basis, and savings are calculated on an incremental basis relative to the measures that precede them. The costs of the measures are levelized over the measure lifetime and include measure incentives as well as an allocation of program administration and M&V costs. Figure 3-18 through Figure 3-20 show the energy efficiency (EE) supply curves for 2033, for all three utilities, and for two achievable potential scenarios – Realistic Achievable Potential (RAP) and Maximum Achievable Potential (MAP).

Overall, we observe that a majority of the energy savings over the 20 year time horizon fall below $0.08/kWh. For RAP, most of the savings occur below $0.04/kWh. RAP holds roughly steady at a cost of about $0.02/kWh going from a cumulative potential of 400,000 to 1,200,000 MWh for KS, 500,000 to 1.6 million MWh for MO, and 600,000 to 2 million MWh for GMO, reflecting the low cost and high potential part of the supply curve. Beyond this cost level, the RAP curve reflects diminishing returns as costs increase rapidly with little increase in cumulative potential. Below the $0.10/kWh cost level, MAP offers the same amount of savings but at a higher marginal cost compared to RAP, which is to be expected as MAP assumes that incentives cover 100% of the incremental cost, while RAP enforces a maximum incentive limit on a levelized $/kWh basis (see section 2.3.3 for how incentives are set).

Figure 3-18. KCP&L - GMO EE Supply Curve – Potential by 2033

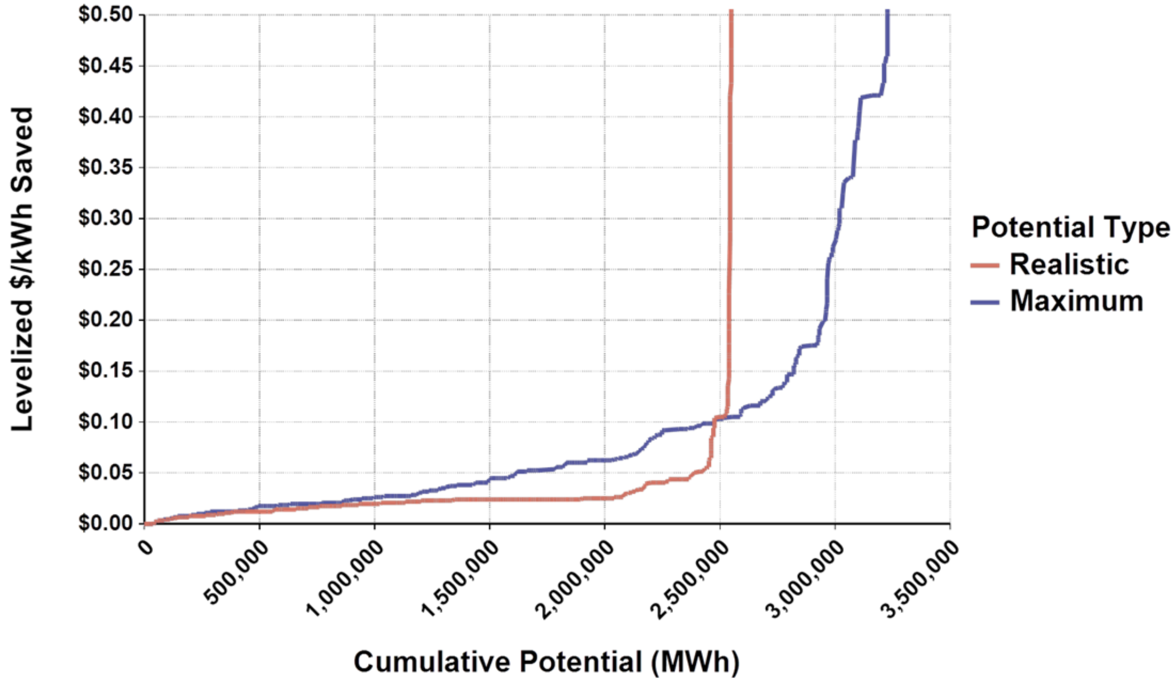


Figure 3-19. KCP&L - MO EE Supply Curve – Potential by 2033

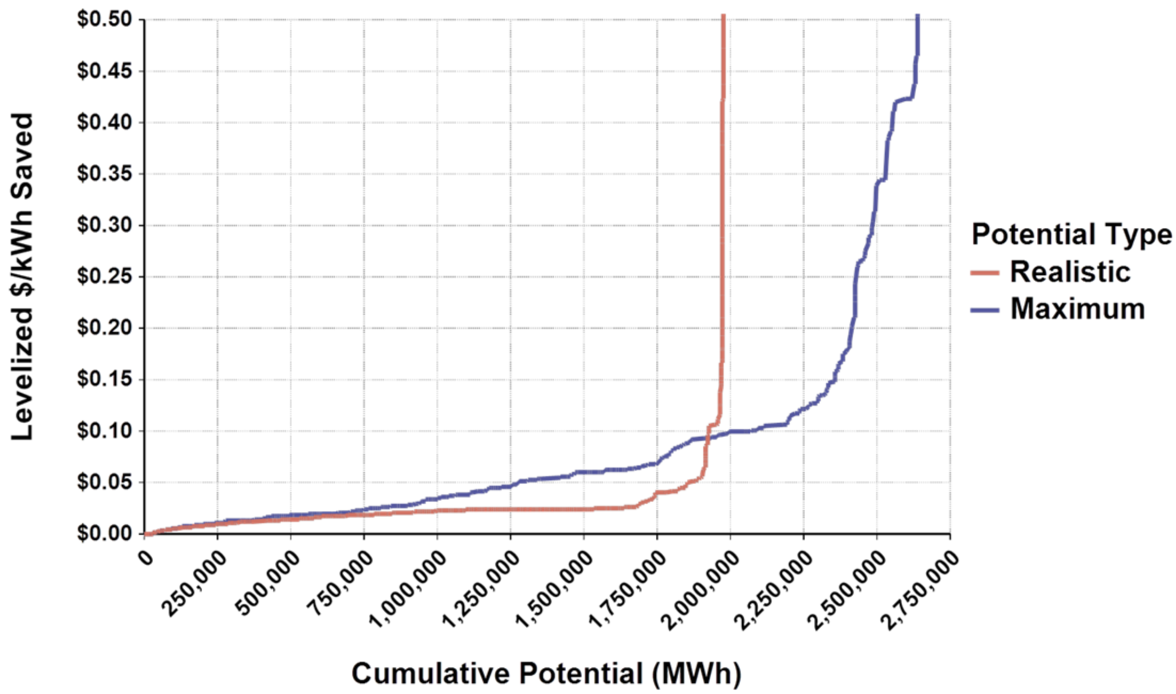
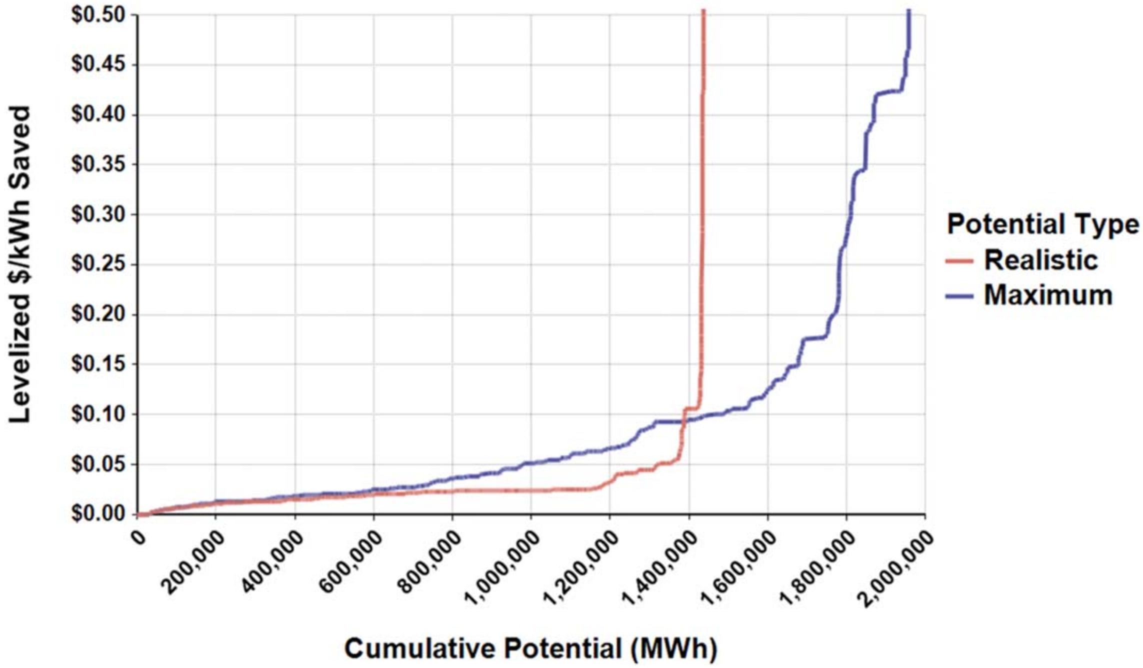


Figure 3-20. KCP&L-KS EE Supply Curve – Potential by 2033



4. Combined Heat and Power

Navigant conducted an analysis of combined heat and power (CHP) systems to identify DSM opportunities from this technology. Navigant developed a stand-alone model for this analysis because the approach varied considerably from the analysis of EE measures considered in this study and because the results from this analysis indicate a large, but uncertain potential from CHP systems. Using this tool, Navigant evaluated the cost-effectiveness of CHP systems driven by a range of prime-movers, system configurations, and usage levels and then identified individual customers that may be well suited to the systems that we found to be cost effective.

Navigant limited this analysis to large commercial and industrial customers and assumed that CHP systems would be fueled by natural gas. Although the model is capable of analyzing both natural gas-fired and opportunity fuel-fired systems, Navigant did not have the data available to determine the availability of opportunity fuels at or near sites. This type of analysis must be highly customized to individual sites and must include a valuation of opportunity fuel feed stocks currently used for other purposes (or disposed of). This type of analysis was beyond the scope of this study.

4.1 *CHP Methodology*

Navigant used the following approach to determine CHP potential:

1. Collect input data for measure characterization.
2. Screen available CHP technologies for TRC cost-effectiveness.
3. Screen TRC cost-effective technologies for participant test cost-effectiveness.
4. Identify customer base suited to cost-effective systems.
5. Estimate economic and achievable potential.
6. Model technology diffusion to estimate incremental and cumulative adoption over time.

4.1.1 CHP Input Data

Navigant collected the following data in order to determine measure cost-effectiveness

» Avoided energy costs ($/kWh) – avoided costs ($/MWh) provided for on-peak, off-peak, and weekend times of use, by month and year. See section 3.7.1 for avoided energy cost assumptions.

» Avoided electric capacity costs ($/kW-yr) – See section 3.7.1 for avoided capacity cost assumptions.

» Avoided natural gas costs – Natural gas costs (in $/1000 cubic feet) from the U.S. DOE EIA forecast of MidContinent wellhead gas prices[46].

[46]U.S. DOE EIA, website "Annual Energy Outlook 2011" http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2011&subject=8-AEO2011&table=72-AEO2011&region=0-0&cases=ref2011-d020911a

- » Retail electricity costs – Current large general service rates ($/kWh) in KCP&L territory, marginal rate (over 360 hours of use) used for 2012[47]. To forecast rates beyond 2012, an annual escalation of 2.3% of 2012 rates was assumed.
- » Retail electric capacity costs - Current large general service rates ($/kW/month) in KCP&L territory, marginal rate (over 7,500 kW) used for 2012[48]. To forecast rates beyond 2012, an annual escalation of 2.3% of 2012 rates was assumed.
- » Retail natural gas costs - Natural gas costs (in $/1000 cubic feet) from the U.S. DOE EIA forecast of industrial gas prices for the west-north-central census division[49].
- » CHP prime-mover costs and performance - Capital cost ($/kW), operation and maintenance (O&M) Cost ($/kWh), heat rate (Btu/kWh), electric output to thermal output ratio (E/T) (kWh/kWh), lifetime (years), and availability (unitless) for CHP systems of a range of sizes driven by reciprocating engines, microturbines, fuel cells, steam turbines and gas turbines developed from data from several sources[50,51,52].
- » Absorption chiller costs and performance – Coefficient of performance (COP), capital cost ($/ton), O&M cost ($/ton-year) from the Midwest Clean Energy Application Center[53]
- » Discount rate – After tax discount rates for each utility provided by the Companies (see section 3.7.1).
- » Technology diffusion rate - Assumed a bass diffusion model with a marketing effectiveness (p) of 0.03 and word-of-mouth strength (q) of 0.365[54]. A start year of 2014 was assumed, based on the time required to get projects of this magnitude implemented.

Additionally, Navigant made the following assumptions in the model

- » System usage – high, medium, and low case scenarios were considered, each with different assumptions about the percentage of CHP system equivalent full load hours during each time of use:
    - o High case: 95% of on-peak hours, 80% of off-peak hours, 80% of weekend hours

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[47] KCP&L, "Commercial and industrial electric service pricing." http://www.kcpl.com/brochures/CIPricing_KS.pdf
[48] KCP&L, "Commercial and industrial electric service pricing.", http://www.kcpl.com/brochures/CIPricing_KS.pdf
[49] U.S. DOE EIA, website "Annual Energy Outlook 2011" http://205.254.135.7/forecasts/archive/aeo11/source_natural_gas.cfm
[50] Combined Heat and Power: Policy Analysis and 2011-2030 Market Assessment (2012). Prepared for the California Energy Commission by ICF International. http://www.meede.org/wp-content/uploads/CHP-Policy-Analysis_Market-Assessment_California_Feb-20121.pdf
[51] US EPA Catalog of CHP Technologies. http://www.epa.gov/chp/basic/catalog.html
[52] Itron, Inc., "CPUC Self-Generation Incentive Program Tenth-Year Impact Evaluation, Final Report" http://www.cpuc.ca.gov/NR/rdonlyres/CF952F3B-0C3C-481D-968A-420F92FC2901/0/SGIP_2010_Impact_Eval_Report.pdf
[53] Midwest Clean Energy Application Center, Combined Heat and Power Resource Guide, http://www.midwestcleanenergy.org/Archive/pdfs/chp_resource_guide_2003sep.pdf
[54] See Mahajan, V., Muller, E., and Wind, Y. (2000). New Product Diffusion Models. Springer. Chapter 12 for estimation of the Bass diffusion parameters for dozens of technologies. This model uses the median value of 0.365 for the word-of-mouth strength in the base case scenario. The Marketing Effectiveness parameter was assumed to be 0.03, representing a somewhat aggressive value that exceeds the most likely value of 0.021 (75th percentile value is 0.055) per Mahajan 2000 but is slightly lower than the 0.04 value used for EE due to the higher complexity of CHP applications.

  - o Medium case: 80% of on-peak hours, 25% of off-peak hours, 25% of weekend hours
  - o Low case: 70% of on-peak hours, 0% of off-peak hours, 0% of weekend hours

» Thermal energy utilization – 85% of recovered heat from the CHP system was assumed to be utilized.

» Fuel for heat efficiency – a base case heating efficiency of 77% was assumed, the base case heating fuel was assumed to be natural gas

» Cooling coefficient of performance – a base case cooling COP of 5 was assumed, the base case cooling fuel was assumed to be electricity

» Project first year program administrative costs - $0.01/annual kWh reduction, modeled as a one-time cost applied at the start of the project.

» Project ongoing program administrative costs - $0.001/annual kWh reduction, modeled as an annual cost applied to the second through tenth years of the project.

4.1.2 CHP TRC Screening

Navigant began the analysis by determining what types of CHP systems would pass the TRC test. Navigant did not include administrative costs in this measure-level analysis. Navigant could then focus the remainder of the analysis on these specific systems and the sites that these CHP systems would likely be suited to.

For the TRC screening, systems defined by all possible combinations of the following parameters were considered:

» Prime mover – fuel cell, gas turbine, micro turbine, reciprocating engine, steam turbine,

» System size – a range of sizes appropriate to each technology was considered

» Heat utilization – heating, cooling, or both. Any system using heat for cooling included the costs of an absorption chiller sized to that CHP system.

» Usage - the low, medium, and high usage cases described above

Each possible system was analyzed using a detailed model of energy generation, net changes in electricity and natural gas consumption (relative to a base case of no on-site generation), and costs (capital, O&M, program administration, net electricity and natural gas costs). Navigant considered each time of use period in each month of the system's expected lifetime. From the usage case definitions, we determined the number of equivalent full load hours in each time of use period and the computed the fuel requirements, energy offsets, and O&M costs for that time of use period.

As discussed below in the Results subsection, Navigant found that some steam turbines and gas turbines with electrical capacity of 500 kW and larger passed the TRC screening, primarily systems which used recovered heat for heating or for heating and cooling. While Navigant found gas turbines under 5 MW to be not cost effective, this contradicts Navigant's observation that gas turbines in the 2.5 MW to 5 MW, 5 MW to 10 MW, and 10 MW to 50 MW ranges are adopted at higher rates than steam turbines[55]. We

[55] Navigant reviewed all CHP installations reported in the ICF International CHP Installation database (http://www.eea-inc.com/chpdata/index.html) in Texas, Louisiana, Oklahoma, Arkansas, Kansas, Missouri, Illinois, Nebraska, and Iowa from 2004 to the present. We observed that gas turbines were three times as prevalent as steam

recognize the considerable uncertainty in our capital cost estimates and decided that combining technologies to define measures would reflect the CHP market most accurately. Navigant therefore developed measures by electrical capacity of systems, rather than prime-movers, and used a weighted average of results from steam turbines and gas turbine in each measure. We have identified in bold the considered systems in Table 4-1 and state the weightings used to define each measure in Table 4-5. Navigant only considered measures with a weighted average TRC of 1.0 or greater in our analysis of economic potential.

In addition to the measure level TRCs, which did not include program administrative costs, Navigant computed a program-level TRC, which *did* include administrative costs. To do this, Navigant first identified all measures with a measure-level TRC (excluding administrative costs) of one or greater. Navigant then took a weighted average of the TRCs of these measures, this time computed *inclusive* of administrative costs. The weighting of measures was proportional to each measure's annual kWh potential.

4.1.3 CHP Participant Test Screening

Navigant's next step was to determine the participant cost-effectiveness of systems passing the TRC screen. The same model used for TRC screening was used for the participant test. However, avoided costs were replaced by retail rates, and incentives were included.

Navigant found that no systems passed a participant test without incentives. This finding was corroborated by the current and historical lack of CHP adoption in the region. However, Navigant found that when incentives on par with those offered elsewhere in the U.S. were included, the systems that passed the TRC screen also passed the participant test. The incentive level used for the results provided in this report was a performance-based incentive of $0.03/kWh, for the first 10 years of the system operation.

A common problem with CHP systems is that they do not remain online as long as the expected lifetime assumed by the program incenting them[56]. To address this issue, Navigant modeled incentives as long-term, performance based incentives, rather than upfront rebates. While the logistics of implementing a 10 year period of monitoring and incentives may be challenging, this financial structure ensures that the ongoing economics of self-generation remain favorable for much of the expected lifetime of the system.

4.1.4 CHP Target Market Identification

After determining the systems that passed TRC and participant tests, Navigant identified customers that that would be candidates for adoption of the large CHP systems being considered. Customers were considered candidates if they had an onsite demand for heating and/or cooling on par with the thermal output of a given CHP system.

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turbines in the 2.5 MW to 5 MW capacity range, and twice as prevalent as steam turbines in the 5 MW to 50 MW capacity range. No gas turbines smaller than 2.5 MW were observed.

[56] For example, the California Self Generation Incentive Program found that capacity factors for fuel cells, reciprocating engines, and micro turbines fell to nearly half of their initial levels within six years.
Itron, Inc. 2011 "CPUC Self-Generation Incentive Program, Tenth-Year Impact Evaluation" for PG&E and the SGIP Working Group.

Navigant's analysis was limited by the information available on customers. The customer database provided to Navigant by KCP&L identified the annual electricity consumption and the building/business type of customers. Navigant assumed that these largest customers used natural gas to provide heating and that their heating and cooling loads – relative to their electric loads – followed patterns observed in other regions of the country for similar analyses. Navigant could not identify customers with access to opportunity fuels such as biogas or combustible agricultural waste: this would have required a detailed study of individual customers, their processes, and their existing valuation of the byproducts of their processes. Table 4-2 through Table 4-4 in the Results section summarize the number of customers, by building or industry type, identified as candidates for each size CHP system.

4.1.5 CHP Economic and Achievable Potential

Navigant defined economic potential as the summation of CHP potential at all sites identified as candidates for CHP systems. Table 4-6 through Table 4-9 in the Results subsection summarize the economic potential of CHP systems at each utility and collectively.

Navigant estimated achievable CHP potential based on their analysis of adoption of high cost ($100,000 and greater) energy efficiency measures in the U.S. Department of Energy's Industrial Assessment Center (IAC) database[57]. The IAC database documents EE measures recommended to industrial sites as part of a standardized energy audit conducted by IAC members. CHP is not considered in these audits. Auditors estimate the cost and simple payback period of each recommendation. Auditors revisit sites approximately one year after the audit and document which recommendations were implemented. From this data, Navigant was able to develop a payback acceptance curve for high-cost measures. There were only a few measures in the database as expensive (multi-million dollar) as MW-scale CHP systems. Navigant therefore examined all recommended measures that cost $100,000 or more.

At an incentive level of $0.03/kWh, the cost-effective CHP measures have a simple payback period of 1.6 to 6.5 years. For the IAC-based payback acceptance curve, measures in this payback range had an adoption rate of 27 to 34%. Navigant therefore assumed that one third of economic potential was realistically achievable. The large capital costs of these systems make them incomparable to other energy efficiency measures, so that the traditional payback acceptance curves used for other EE measures would not apply here. The relatively low ratio of achievable to economic potential reflects significant technical, financial, and institutional barriers to the adoption of large mechanical systems.

Measures with a payback period less than six months had an adoption rate of approximately 40% on the IAC-based payback acceptance curve. Navigant assumed a maximum achievable potential of 50% to account for this observed maximum adoption rate plus additional adoption facilitated by financing arrangements (e.g. third party ownership) that would be more likely to be available for CHP systems than for the EE measures in the IAC database. The maximum achievable potential scenario assumes the same $0.03/kWh incentive level as the realistic achievable potential scenario for CHP. Therefore these two scenarios are intended to reflect the uncertainty in the likely adoption of these expensive and complex measures.

[57] http://iac.rutgers.edu/database/

4.1.6 Technology Diffusion

As discussed above, Navigant assumed CHP technology diffusion curve comparable to that used in the other portions of this potential study. However, the curve was shifted forward in time (first participants in 2015), based on the time required to get projects of this magnitude implemented.

This diffusion assumption results in a fractional number of participants per year. In reality, the total number of achievable participants is small (~24 per utility) and the incremental participation in a given year would be discrete and may be zero in some years.

4.2 CHP Results

Table 4-1 states the cost and performance parameters assumed for each considered CHP system, and the resulting TRC values for the high usage cases for each of the three thermal output utilization scenarios (heating, cooling, heating and cooling). Steam turbines and gas turbines are the only technologies to pass the TRC test. Table 4-2 through Table 4-4 summarize the number of candidate customers identified for each utility, by customer segment and size of system (in kW of electrical capacity). More than half of the candidate sites for systems 1 MW and larger are in the "Chemicals" segment. About 41% of the candidate sites for systems between 500 kW and 1 MW are in the "Food" segment. Candidates are distributed across all three utilities.

Navigant developed a measure for each of the five largest CHP system size categories. For each measure, a weighted average of costs and impacts for steam turbines and gas turbines was used. The weights, costs, impacts, and cost-effectiveness of each measure are shown in Table 4-5.

Table 4-6 through Table 4-9 show the economic and equilibrium achievable potential for each utility. Table 4-10 shows the cumulative achievable potential by year, from 2014 to 2034.

The program-level TRC for this collection of measures is 1.42, and the participant test value is 1.70.

Although we think including gas turbines with TRCs of less than 1.0 in some measures leads to the most accurate reflection of the CHP market, as discussed in section 4.1.2, we also executed our CHP model *without* this adjustment in order to examine the impact of this decision on the potential results. For this run of the model, Navigant excluded gas turbines in the 2.5 MW to 5 MW range, so that the measure defined by this range was solely based on steam turbines results. This resulted in no change in electrical potential (by design of the analysis) and an approximately 10% increase in natural gas impact of this measure.

Table 4-1. Modeled CHP Systems[58] and Resulting TRC For High Usage Cases

Generator Type	Range	Capital Cost ($/kW)	O&M Cost ($/kWh)	Heat Rate (Btu/kWh)	Electrical to Thermal Energy Output Ratio	Lifetime (years)	Availability	TRC - thermal output for heating	TRC - thermal output for cooling	TRC - thermal output for heating and cooling
Fuel Cell	100 to 500 kW	$5,875	0.037	9307	1.28	8	0.89	0.09	0.04	0.06
Fuel Cell	500 to 1,000 kW	$5,395	0.036	8279	1.72	8	0.89	0.1	0.06	0.08
Fuel Cell	1,000 to 2,500 kW	$5,258	0.033	8022	2.16	8	0.89	0.1	0.07	0.08
Gas Turbine	500 to 1,000 kW	$3,606	0.012	16047	0.47	20	0.95	0.37	0.16	0.29
Gas Turbine	1,000 to 2,500 kW	$2,632	0.01	15240	0.53	20	0.95	0.49	0.22	0.38
Gas Turbine	**2,500 to 5,000 kW**	**$1,938**	**0.009**	**13199**	**0.66**	**20**	**0.95**	**0.72**	**0.42**	**0.59**
Gas Turbine	**5,000 to 10,000 kW**	**$1,464**	**0.008**	**11883**	**0.71**	**20**	**0.95**	**1.07**	**0.67**	**0.86**
Gas Turbine	**10,000 to 50,000 kW**	**$1,138**	**0.005**	**9462**	**1**	**20**	**0.95**	**1.68**	**1.2**	**1.39**
Microturbine	100 to 500 kW	$3,000	0.022	12247	0.69	6	0.95	0.08	0	0.01

[58] Systems identified in bold were included in our assessment of economic potential. The primary criterion for inclusion was a TRC for thermal output of heating of greater than ~1.0, though exceptions apply as discussed in section 4.1.2.

Generator Type	Range	Capital Cost ($/kW)	O&M Cost ($/kWh)	Heat Rate (Btu/kWh)	Electrical to Thermal Energy Output Ratio	Lifetime (years)	Availability	TRC - thermal output for heating	TRC - thermal output for cooling	TRC - thermal output for heating and cooling
Microturbine	500 to 1,000 kW	$2,900	0.02	12247	0.69	6	0.95	0.09	0	0.01
Reciprocating Engine	100 to 500 kW	$2,417	0.021	11501	0.68	7	0.95	0.18	0.04	0.11
Reciprocating Engine	500 to 1,000 kW	$1,840	0.015	9760	0.79	7	0.95	0.31	0.12	0.21
Reciprocating Engine	1,000 to 2,500 kW	$1,491	0.014	9616	0.88	7	0.95	0.34	0.14	0.24
Reciprocating Engine	2,500 to 5,000 kW	$1,338	0.013	9134	1.05	7	0.95	0.36	0.17	0.26
Reciprocating Engine	5,000 to 10,000 kW	$1,338	0.013	9134	1.05	7	0.95	0.36	0.18	0.26
Steam Turbine	**500 to 1,000 kW**	**$1,167**	**0.005**	**13661**	**0.5**	**15**	**0.89**	**1.15**	**0.47**	**0.73**
Steam Turbine	**1,000 to 2,500 kW**	**$950**	**0.005**	**13661**	**0.5**	**15**	**0.89**	**1.35**	**0.53**	**0.83**
Steam Turbine	**2,500 to 5,000 kW**	**$496**	**0.005**	**13661**	**0.48**	**15**	**0.89**	**2.21**	**0.78**	**1.21**
Steam Turbine	**5,000 to 10,000 kW**	**$496**	**0.005**	**13661**	**0.48**	**15**	**0.89**	**2.21**	**0.78**	**1.21**
Steam Turbine	**10,000 to 50,000 kW**	**$496**	**0.005**	**13661**	**0.48**	**15**	**0.89**	**2.21**	**0.78**	**1.21**

Table 4-2. Number of Candidate Customers by Segment and CHP Electrical Capacity - GMO

Segment	Application of Waste Heat	Usage Case	500 to 1,000 kW	1,000 to 2,500 kW	2,500 to 5,000 kW	5,000 to 10,000 kW	10,000 to 50,000 kW	Total
Chemicals	Heating	High		6			1	7
Fab Metals	Heating	High	4					4
Food	Heating	High	8	3				11
Healthcare	Heating and Cooling	Medium	1					1
Motor Freight Transportation	Heating	High	2					2
Office - Large	Heating and Cooling	Low	3	1				4
Other Industrial	Heating	High	1					1
Rubber-Plastics	Heating	High		1				1
Stone-Clay-Glass	Heating	High			2			2
Transportation Equipment	Heating	High	1					1
		Total	20	11	2	0	1	34

Table 4-3. Number of Candidate Customers by Segment and CHP Electrical Capacity – KCP&L MO

Segment	Application of Waste Heat	Usage Case	500 to 1,000 kW	1,000 to 2,500 kW	2,500 to 5,000 kW	5,000 to 10,000 kW	10,000 to 50,000 kW	Total
Chemicals	Heating	High		3			2	5
Food	Heating	High	4	2		1		3
Healthcare	Heating and Cooling	Medium	6					
Office - Large	Heating and Cooling	Low	2	1				1
Petroleum	Heating	High		2				2
Rubber-Plastics	Heating	High		1				1
Stone-Clay-Glass	Heating	High		1	1			2
		Total	12	10	1	1	2	26

Table 4-4. Number of Candidate Customers by Segment and CHP Electrical Capacity – KCP&L KS

Segment	Application of Waste Heat	Usage Case	500 to 1,000 kW	1,000 to 2,500 kW	2,500 to 5,000 kW	5,000 to 10,000 kW	10,000 to 50,000 kW	Total
Segment	Application of Waste Heat	Usage Case	500 to 1,000 kW	1,000 to 2,500 kW	2,500 to 5,000 kW	5,000 to 10,000 kW	10,000 to 50,000 kW	Total
Chemicals	Heating	High		6				6
Food	Heating	High	3					3
Healthcare	Heating and Cooling	Medium	1					1
Motor Freight Transportation	Heating	High	1					1
Office - Large	Heating and Cooling	Low		1				1
Rubber-Plastics	Heating	High		1				1
		Total	5	8	0	0	0	13

Table 4-5. Measure Level Results

CHP System Range	Measure % Steam Turbine	Measure % Gas Turbine	Capital Cost per CHP system (without incentive)	Annual O&M Costs	Annual NG Increase (therms)	Annual Electricity Reduction (kWh)	Annual Demand Reduction (kW)	Measure Life (years)	TRC	Participant Test	Number of Candidate Sites
500 to 1,000 kW	100%	0%	$875,250	$25,422	311,297	5,084,348	712	15	1.15	1.39	37
1,000 to 2,500 kW	100%	0%	$1,662,500	$59,317	726,360	11,863,478	1,662	15	1.35	1.62	29
2,500 to 5,000 kW	33%	67%	$5,483,025	$205,573	1,848,695	26,570,000	3,561	18	1.21	1.28	3
5,000 to 10,000 kW	33%	67%	$8,584,200	$374,785	3,365,108	53,140,001	7,121	18	1.45	1.51	1
10,000 to 50,000 kW	33%	67%	$27,784,200	$1,062,800	12,178,350	212,560,002	28,485	18	1.85	1.92	3

Table 4-6. Economic and Achievable Potential by CHP System Size for All Utilities

Measure	Economic Potential - kWh	Economic Potential - kW	Realistically Achievable Potential - kWh	Realistically Achievable Potential - kW	Maximum Achievable Potential - kWh	Maximum Achievable Potential - kW
500 to 1,000 kW	188,120,858	26,349	62,079,883	8,695	94,060,429	13,174
1,000 to 2,500 kW	344,040,848	48,187	113,533,480	15,902	172,020,424	24,094
2,500 to 5,000 kW	79,710,001	10,682	26,304,300	3,525	39,855,000	5,341
5,000 to 10,000 kW	53,140,001	7,121	17,536,200	2,350	26,570,000	3,561
10,000 to 50,000 kW	637,680,006	85,455	210,434,402	28,200	318,840,003	42,728
Total	1,302,691,712	177,794	429,888,265	58,672	651,345,856	88,897

Table 4-7. Economic and Achievable Potential by CHP System Size – GMO

Measure	Economic Potential - kWh	Economic Potential - kW	Realistically Achievable Potential - kWh	Realistically Achievable Potential - kW	Maximum Achievable Potential - kWh	Maximum Achievable Potential - kW
Measure	Economic Potential - kWh	Economic Potential - kW	Achievable Potential - kWh	Achievable Potential - kW	Maximum Achievable Potential - kWh	Maximum Achievable Potential - kW
500 to 1,000 kW	101,686,950	14,243	33,556,694	4,700	50,843,475	7,121
1,000 to 2,500 kW	130,498,253	18,278	43,064,423	6,032	65,249,126	9,139
2,500 to 5,000 kW	53,140,001	7,121	17,536,200	2,350	26,570,000	3,561
5,000 to 10,000 kW	-	-	-	-	-	-
10,000 to 50,000 kW	212,560,002	28,485	70,144,801	9,400	106,280,001	14,243

Table 4-8. Economic and Achievable Potential by CHP System Size – KCP&L MO

Measure	Economic Potential - kWh	Economic Potential - kW	Achievable Potential - kWh	Achievable Potential - kW	Maximum Achievable Potential - kWh	Maximum Achievable Potential - kW
500 to 1,000 kW	61,012,170	8,546	20,134,016	2,820	30,506,085	4,273
1,000 to 2,500 kW	118,634,775	16,616	39,149,476	5,483	59,317,388	8,308
2,500 to 5,000 kW	26,570,000	3,561	8,768,100	1,175	13,285,000	1,780
5,000 to 10,000 kW	53,140,001	7,121	17,536,200	2,350	26,570,000	3,561
10,000 to 50,000 kW	425,120,004	56,970	140,289,601	18,800	212,560,002	28,485
Total	684,476,950	92,814	225,877,393	30,628	342,238,475	46,407

Table 4-9. Economic and Achievable Potential by CHP System Size – KCP&L KS

Measure	Economic Potential - kWh	Economic Potential - kW	Achievable Potential - kWh	Achievable Potential - kW	Maximum Achievable Potential - kWh	Maximum Achievable Potential - kW
500 to 1,000 kW	25,421,738	3,561	8,389,173	1,175	12,710,869	1,780
1,000 to 2,500 kW	94,907,820	13,293	31,319,581	4,387	47,453,910	6,647
2,500 to 5,000 kW	-	-	-	-	-	-
5,000 to 10,000 kW	-	-	-	-	-	-
10,000 to 50,000 kW	-	-	-	-	-	-
Total	120,329,558	16,854	39,708,754	5,562	60,164,779	8,427

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Table 4-10. Cumulative Realistic Achievable Potential by Year

Year	GMO - GWh	GMO - MW	KCP&L MO - GWh	KCP&L MO - MW	KCP&L KS - GWh	KCP&L KS - MW	All Utilities - GWh	All Utilities - MW
2014	-	-	-	-	-	-	-	-
2015	2.30	0.31	3.16	0.43	0.56	0.08	6.02	0.82
2016	4.60	0.63	6.32	0.86	1.11	0.15	12.04	1.64
2017	11.50	1.57	15.81	2.16	2.78	0.38	30.09	4.11
2018	20.70	2.83	28.46	3.88	5.00	0.68	54.17	7.39
2019	32.20	4.40	44.27	6.04	7.78	1.06	84.26	11.50
2020	46.17	6.30	63.47	8.66	11.16	1.52	120.80	16.49
2021	62.27	8.50	85.61	11.68	15.05	2.05	162.93	22.24
2022	79.52	10.85	109.32	14.92	19.22	2.62	208.07	28.40
2023	96.94	13.23	133.27	18.19	23.43	3.20	253.63	34.62
2024	113.04	15.43	155.40	21.21	27.32	3.73	295.76	40.37
2025	126.68	17.29	174.15	23.77	30.62	4.18	331.44	45.24
2026	137.69	18.79	189.29	25.83	33.28	4.54	360.25	49.17
2027	146.06	19.94	200.81	27.41	35.30	4.82	382.17	52.16
2028	151.98	20.74	208.94	28.52	36.73	5.01	397.65	54.27
2029	156.09	21.30	214.58	29.29	37.72	5.15	408.39	55.74
2030	158.72	21.66	218.20	29.78	38.36	5.24	415.27	56.68
2031	160.36	21.89	220.46	30.09	38.76	5.29	419.57	57.26
2032	161.34	22.02	221.81	30.27	38.99	5.32	422.15	57.62
2033	162.00	22.11	222.72	30.40	39.15	5.34	423.87	57.85
2034	162.17	22.13	222.94	30.43	39.19	5.35	424.30	57.91

Table 4-11. Cumulative Maximum Achievable Potential by Year

Year	GMO - GWh	GMO - MW	KCP&L MO - GWh	KCP&L MO - MW	KCP&L KS - GWh	KCP&L KS - MW	All Utilities - GWh	All Utilities - MW
2014	-	-	-	-	-	-	-	-
2015	3.49	0.48	4.79	0.65	0.84	0.11	9.12	1.24
2016	6.97	0.95	9.58	1.31	1.68	0.23	18.24	2.49
2017	17.43	2.38	23.96	3.27	4.21	0.57	45.59	6.22
2018	31.37	4.28	43.12	5.89	7.58	1.03	82.07	11.20
2019	48.79	6.66	67.08	9.16	11.79	1.61	127.66	17.42
2020	69.95	9.55	96.17	13.13	16.91	2.31	183.03	24.98
2021	94.35	12.88	129.71	17.70	22.80	3.11	246.86	33.69
2022	120.49	16.44	165.64	22.61	29.12	3.97	315.25	43.03
2023	146.88	20.05	201.92	27.56	35.50	4.84	384.29	52.45
2024	171.27	23.38	235.46	32.14	41.39	5.65	448.13	61.16
2025	191.93	26.20	263.87	36.01	46.39	6.33	502.19	68.54
2026	208.61	28.47	286.80	39.14	50.42	6.88	545.83	74.50
2027	221.31	30.20	304.25	41.52	53.49	7.30	579.05	79.03
2028	230.27	31.43	316.57	43.21	55.65	7.60	602.49	82.23
2029	236.50	32.28	325.13	44.37	57.16	7.80	618.78	84.45
2030	240.48	32.82	330.60	45.12	58.12	7.93	629.20	85.87
2031	242.97	33.16	334.02	45.59	58.72	8.01	635.71	86.76
2032	244.46	33.36	336.08	45.87	59.08	8.06	639.62	87.30
2033	245.46	33.50	337.45	46.06	59.32	8.10	642.23	87.65
2034	245.71	33.53	337.79	46.10	59.38	8.10	642.88	87.74

4.3 CHP Conclusions

MW-scale steam- and gas-turbine CHP systems appear to be cost-effective in the KCP&L territory. While the number of sites with achievable potential is small (~24 per utility), the equilibrium realistic achievable potential is approximately 58 MW. Candidate sites include both traditional CHP adopters (i.e, industrial and medical sites) and less typical CHP adopters that could utilize thermal energy for both heating and cooling (i.e., large offices).

Additional potential may exist at sites with access to opportunity fuels, such as waste water treatment facilities, agricultural sites, and wood processing sites. However, a custom analysis would be required of each site to address highly variable factors such as the quantity of available fuel, and the economics of using the opportunity fuel for power generation instead of its current use, and the need/ability to export generated power. Historically, CHP systems have been mothballed when natural gas prices rise; systems fueled by opportunity fuels do not bear this risk.

Regardless of the fuel, valuable services that can potentially be provided to customers are identifying candidate sites, providing preliminary cost-effectiveness analyses, and providing independent review of contractor proposals and savings claims.

Long term performance based incentives could help ensure that project economics remain favorable – and that systems remain in operation – for the expected lifetime of the systems.

Finally, it is important to recognize that there is an expected small number of participants, which will inevitably have discrete patterns of incremental participation -- likely be one or two new participants in some years and zero in others.

5. Combined Savings Estimates (EE/CHP/DR)

This section aggregates the energy savings, demand savings, and cumulative budget results for the realistic achievable potential (RAP) scenario described in sections 3 (for energy efficiency), section 4 (for CHP), and in the stand-alone report on Demand Response. For comparison with the results of this study, the targets for cumulative energy and demand savings in 4 CSR 240.094 are provided below. Comparisons, however, are subject to the caveats offered in Section 2.5. As a result, we provide this table once in the report as opposed to providing "side by side" comparisons of potential versus the targets below.

Table 5-1. Cumulative Energy and Demand Savings Targets per MO 4 CSR 240.094

Year	Energy (% of Baseline)	Demand (% of Baseline)
2012	0.30%	1.00%
2013	0.80%	2.00%
2014	1.50%	3.00%
2015	2.40%	4.00%
2016	3.50%	5.00%
2017	4.80%	6.00%
2018	6.30%	7.00%
2019	8.00%	8.00%
2020	9.90%	9.00%
beyond 2021	+1.9%/year	+1.0%/year

5.1 Cumulative Realistic Achievable Potential (RAP) for Energy Savings

Cumulative achievable potential energy savings for energy efficiency (EE), combined heat and power (CHP), and demand response (DR) for KCP&L GMO, KCP&L MO, and KCP&L KS are provided below in Table 5-1 through Table 5-4, which illustrate results for the RAP scenario. Cumulative potential as a percentage of baseline forecast energy sales at the end of the 20-year forecast horizon ranges from 17.6% to 22.5%, with the largest value in KCP&L GMO's service territory. This difference is primarily attributable to GMO's higher forecast annual growth rate, lending additional opportunities for savings in new buildings. Over a nearer-term time horizon of ten years, cumulative achievable potential is 14.5% (or 1.45%/year) for KCP&L GMO, 13.8% (or 1.38%/year) for KCP&L MO, and 11.8% (or 1.18%/year) for KCP&L KS. As noted in these figures, for DR we conservatively assume there are no significant energy savings, which is consistent with typical industry assumptions for dispatch-able DR programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU.

Table 5-2. Cumulative EE/DR/CHP Energy RAP (MWh) – KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	90,895	0	0	90,895	1.1%
2015	191,727	0	2,300	194,027	2.2%
2016	302,033	0	4,600	306,633	3.5%
2017	427,785	0	11,501	439,286	4.9%
2018	569,884	0	20,702	590,586	6.5%
2019	722,942	0	32,203	755,146	8.2%
2020	881,328	0	46,169	927,497	9.9%
2021	1,037,947	0	62,271	1,100,218	11.5%
2022	1,187,910	0	79,522	1,267,433	13.1%
2023	1,330,940	0	96,938	1,427,878	14.5%
2024	1,467,700	0	113,040	1,580,739	15.7%
2025	1,599,381	0	126,677	1,726,058	16.9%
2026	1,727,665	0	137,685	1,865,350	17.9%
2027	1,851,215	0	146,065	1,997,280	18.8%
2028	1,973,566	0	151,979	2,125,545	19.6%
2029	2,093,452	0	156,087	2,249,539	20.3%
2030	2,208,148	0	158,716	2,366,863	20.9%
2031	2,321,418	0	160,359	2,481,777	21.5%
2032	2,434,251	0	161,345	2,595,596	22.0%
2033	2,548,082	0	162,002	2,710,084	22.5%

Table 5-3. Cumulative EE/DR/CHP Energy RAP (MWh) -- KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	83,217	0	0	83,217	0.9%
2015	175,255	0	3,162	178,417	2.0%
2016	277,039	0	6,325	283,364	3.2%
2017	392,661	0	15,811	408,472	4.5%
2018	522,323	0	28,461	550,783	6.1%
2019	660,805	0	44,272	705,077	7.7%
2020	801,979	0	63,472	865,450	9.4%
2021	938,370	0	85,608	1,023,978	11.0%
2022	1,064,988	0	109,325	1,174,312	12.5%
2023	1,180,430	0	133,268	1,313,697	13.8%
2024	1,284,982	0	155,404	1,440,386	15.0%
2025	1,379,080	0	174,151	1,553,232	16.0%
2026	1,467,237	0	189,285	1,656,522	16.9%
2027	1,550,686	0	200,805	1,751,491	17.7%

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2028	1,629,698	0	208,937	1,838,635	18.3%
2029	1,704,979	0	214,584	1,919,563	18.9%
2030	1,775,261	0	218,198	1,993,459	19.4%
2031	1,843,326	0	220,456	2,063,783	19.8%
2032	1,909,732	0	221,812	2,131,544	20.2%
2033	1,975,390	0	222,715	2,198,106	20.6%

Table 5-4. Cumulative EE/DR/CHP Energy RAP (MWh) -- KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	60,804	0	0	60,804	0.9%
2015	128,797	0	556	129,353	1.9%
2016	201,858	0	1,112	202,970	3.0%
2017	283,429	0	2,780	286,209	4.2%
2018	374,060	0	5,003	379,063	5.5%
2019	470,598	0	7,783	478,381	6.8%
2020	569,032	0	11,158	580,190	8.2%
2021	664,736	0	15,050	679,786	9.5%
2022	754,392	0	19,219	773,611	10.7%
2023	837,423	0	23,428	860,851	11.8%
2024	913,897	0	27,320	941,217	12.7%
2025	983,873	0	30,615	1,014,488	13.5%
2026	1,050,099	0	33,276	1,083,375	14.3%
2027	1,112,106	0	35,301	1,147,407	14.9%
2028	1,171,573	0	36,731	1,208,303	15.5%
2029	1,228,577	0	37,723	1,266,300	16.0%
2030	1,282,500	0	38,359	1,320,858	16.5%
2031	1,335,151	0	38,756	1,373,907	16.9%
2032	1,386,789	0	38,994	1,425,783	17.2%
2033	1,437,728	0	39,153	1,476,880	17.6%

5.2 *Cumulative Maximum Achievable Potential (MAP) for Energy Savings*

Cumulative maximum achievable potential energy savings for energy efficiency (EE), combined heat and power (CHP), and demand response (DR) for KCP&L GMO, KCP&L MO, and KCP&L KS are provided below in Table 5-5 through Table 5-7, which do not exclude opt-out customers. Cumulative maximum achievable potential as a percentage of baseline forecast energy sales at the end of the 20-year forecast horizon ranges from 24.5% to 29.2%, with the largest value in KCP&L GMO's service territory. As with RAP, this difference is primarily attributable to GMO's higher forecast annual growth rate, lending additional opportunities for savings in new buildings. Over a nearer-term time horizon, 10 years, cumulative maximum achievable potential is 18.4% (or 1.84%/year) for KCP&L GMO, 18.9% (or 1.89%/year) for KCP&L MO, and 16.2% (or 1.62%/year) for KCP&L KS. As noted in these figures, for DR we conservatively assume there are no significant energy savings, which is consistent with typical industry assumptions for dispatch-able DR programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU.

Table 5-5. Cumulative EE/DR/CHP Energy MAP (MWh) – KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	106,150	0	0	106,150	1.2%
2015	227,510	0	3,485	230,995	2.7%
2016	364,356	0	6,970	371,327	4.2%
2017	523,176	0	17,426	540,602	6.1%
2018	703,168	0	31,367	734,535	8.1%
2019	897,225	0	48,793	946,018	10.3%
2020	1,098,957	0	69,953	1,168,909	12.5%
2021	1,298,414	0	94,349	1,392,764	14.6%
2022	1,490,214	0	120,488	1,610,702	16.6%
2023	1,672,037	0	146,876	1,818,913	18.4%
2024	1,847,554	0	171,273	2,018,827	20.1%
2025	2,018,670	0	191,935	2,210,605	21.6%
2026	2,187,097	0	208,614	2,395,711	23.0%
2027	2,350,357	0	221,310	2,571,667	24.2%
2028	2,513,766	0	230,272	2,744,038	25.3%
2029	2,673,904	0	236,495	2,910,400	26.3%
2030	2,826,627	0	240,479	3,067,106	27.1%
2031	2,976,165	0	242,968	3,219,132	27.9%
2032	3,123,259	0	244,462	3,367,721	28.6%
2033	3,270,051	0	245,457	3,515,509	29.2%

Table 5-6. Cumulative EE/DR/CHP Energy MAP (MWh) – KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	103,809	0	0	103,809	1.2%
2015	222,681	0	4,791	227,472	2.6%
2016	358,190	0	9,583	367,772	4.1%
2017	515,413	0	23,957	539,370	6.0%
2018	692,514	0	43,122	735,636	8.1%
2019	881,699	0	67,079	948,778	10.4%
2020	1,075,116	0	96,169	1,171,285	12.7%
2021	1,261,494	0	129,708	1,391,202	14.9%
2022	1,435,067	0	165,643	1,600,710	17.0%

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2023	1,591,901	0	201,921	1,793,822	18.9%
2024	1,733,479	0	235,460	1,968,939	20.6%
2025	1,860,562	0	263,866	2,124,428	21.9%
2026	1,980,594	0	286,796	2,267,390	23.2%
2027	2,096,715	0	304,250	2,400,965	24.2%
2028	2,208,109	0	316,571	2,524,680	25.2%
2029	2,315,369	0	325,127	2,640,496	26.0%
2030	2,416,230	0	330,602	2,746,832	26.7%
2031	2,513,709	0	334,025	2,847,734	27.4%
2032	2,607,909	0	336,078	2,943,987	28.0%
2033	2,699,565	0	337,447	3,037,012	28.5%

Table 5-7. Cumulative EE/DR/CHP Energy MAP (MWh) – KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	75,079	0	0	75,079	1.1%
2015	162,511	0	842	163,353	2.4%
2016	260,583	0	1,685	262,267	3.9%
2017	373,070	0	4,212	377,282	5.5%
2018	499,032	0	7,581	506,613	7.3%
2019	633,542	0	11,792	645,334	9.2%
2020	771,503	0	16,906	788,410	11.2%
2021	905,533	0	22,802	928,335	13.0%
2022	1,030,013	0	29,120	1,059,133	14.7%
2023	1,145,041	0	35,497	1,180,539	16.2%
2024	1,250,737	0	41,393	1,292,130	17.5%
2025	1,347,196	0	46,387	1,393,583	18.6%
2026	1,439,352	0	50,418	1,489,770	19.6%
2027	1,526,001	0	53,486	1,579,488	20.5%
2028	1,610,665	0	55,652	1,666,317	21.4%
2029	1,692,504	0	57,157	1,749,660	22.1%
2030	1,770,291	0	58,119	1,828,411	22.8%
2031	1,846,247	0	58,721	1,904,968	23.4%
2032	1,920,151	0	59,082	1,979,233	23.9%
2033	1,992,450	0	59,322	2,051,772	24.5%

5.3 Cumulative Realistic Achievable Potential (RAP) for Peak Demand Savings

Cumulative achievable potential peak demand savings for EE, CHP, and DR for KCP&L GMO, KCP&L MO, and KCP&L KS are provided below in

Table 5-8 through Table 5-10, which illustrate results for the RAP scenario. Cumulative potential as a percentage of baseline forecast peak demand at the end of the 20-year forecast horizon ranges from 24% to 40%, with the largest value in KCP&L GMO's service territory. These percentage differences are driven by the potential for DR, which varies considerably among utilities. DR differences are driven largely by observed differences in the response of large C&I customers (i.e., GMO observes much greater response from large C&I customers in interruptible tariff programs than KS). These assumptions are based on observed results from the Companies' MPower program and are also reasonably consistent with assumptions in the FERC National Assessment of Demand Response Potential[59].

Finally, we note that the EE and DR potential estimates were estimated independently with separate models. If EE and DR programs are simultaneously pursued with adoption as forecast below, there would likely be some interaction between the two, whereby DR potential could be reduced due to aggressive adoption of EE. The estimates below do not adjust for such possible overlap. The extent of this possible reduction in DR potential when combined with an aggressive EE portfolio would depend on a number of factors, including the extent to which the customers participating in EE and DR overlap (as well as the extent to which measures overlap). Though, as an upper bound, one could postulate that the percentage reduction in DR potential when combined with the EE savings achieved below would be roughly 22%, which is the fraction of baseline peak demand accounted for by EE measures alone in the GMO service territory (assuming 100% overlap of EE and DR customers and measures). Such overlap could therefore potentially reduce the combined percentages below (for GMO, for instance), by up to a relative value of 9.4% (or 4 absolute percentage points, from 40% of peak in 2033 to 36%). In reality, the reduction due to overlap is likely to be lower than this upper bound. Additional scenarios for peak demand savings, including maximum achievable potential, are provided in Appendix L.

[59] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

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Table 5-8. Cumulative EE/DR/CHP Demand RAP (MW) -- KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	20	36	0.0	56	2.8%
2015	44	66	0.3	110	5.4%
2016	71	98	0.6	169	8.2%
2017	102	130	1.6	233	11.2%
2018	137	162	2.8	302	14.4%
2019	176	195	4.4	375	17.6%
2020	217	229	6.3	452	20.8%
2021	257	262	8.5	527	23.9%
2022	295	296	10.9	602	26.9%
2023	331	330	13.2	674	29.7%
2024	364	365	15.4	745	32.3%
2025	395	375	17.3	787	33.6%
2026	424	384	18.8	827	34.7%
2027	452	394	19.9	866	35.7%
2028	479	404	20.7	904	36.6%
2029	506	415	21.3	942	37.4%
2030	530	425	21.7	977	38.1%
2031	555	435	21.9	1,011	38.7%
2032	579	445	22.0	1,046	39.3%
2033	603	455	22.1	1,080	39.9%

Table 5-9. Cumulative EE/DR/CHP Demand RAP (MW) -- KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	19	78	0.0	97	4.9%
2015	41	91	0.4	132	6.7%
2016	65	110	0.9	176	8.9%
2017	94	125	2.2	221	11.1%
2018	127	141	3.9	271	13.5%
2019	162	156	6.0	325	16.1%
2020	198	172	8.7	379	18.6%
2021	233	187	11.7	432	21.1%
2022	266	201	14.9	482	23.4%
2023	295	215	18.2	528	25.5%
2024	320	230	21.2	571	27.4%
2025	343	233	23.8	600	28.5%
2026	364	237	25.8	626	29.5%
2027	382	241	27.4	650	30.3%
2028	400	243	28.5	672	31.0%

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2029	416	246	29.3	692	31.6%
2030	432	249	29.8	711	32.2%
2031	447	252	30.1	729	32.6%
2032	461	255	30.3	746	33.1%
2033	475	258	30.4	763	33.5%

Table 5-10. Cumulative EE/DR/CHP Demand RAP (MW) -- KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total	% of Baseline
2014	14	54	0.0	67	3.9%
2015	30	66	0.1	95	5.4%
2016	47	77	0.2	125	7.0%
2017	67	88	0.4	156	8.7%
2018	90	99	0.7	190	10.5%
2019	115	108	1.1	224	12.4%
2020	140	117	1.5	259	14.1%
2021	165	124	2.1	292	15.7%
2022	189	130	2.6	322	17.2%
2023	210	137	3.2	350	18.5%
2024	229	143	3.7	375	19.7%
2025	246	146	4.2	396	20.5%
2026	262	148	4.5	415	21.3%
2027	276	151	4.8	432	21.9%
2028	289	153	5.0	448	22.4%
2029	302	155	5.1	463	22.9%
2030	314	157	5.2	477	23.2%
2031	326	159	5.3	490	23.6%
2032	337	161	5.3	504	24.0%
2033	348	164	5.3	517	24.3%

5.4 Cumulative Budget for Realistic Achievable Potential

Table 5-11 through Table 5-13 provide the combined EE/DR/CHP cumulative budget through 2033 for the realistic achievable potential scenario. Additional budget scenarios, including those for maximum achievable potential, are provided in Appendix L.

Table 5-11. Cumulative RAP Budget ($) -- KCP&L GMO

KCP&L GMO	Energy Efficiency	Demand Response	CHP	Total
2014	$14,765,823	$2,976,743	$23,002	$17,765,568
2015	$34,277,882	$9,653,744	$117,312	$44,048,937
2016	$59,042,115	$17,403,516	$213,921	$76,659,552
2017	$89,528,258	$26,983,893	$501,450	$117,013,602
2018	$125,672,657	$38,716,017	$890,189	$165,278,863
2019	$166,225,135	$54,126,156	$1,382,438	$221,733,729
2020	$209,994,911	$70,944,741	$1,987,234	$282,926,886
2021	$255,064,785	$90,015,937	$2,693,569	$347,774,291
2022	$300,060,744	$111,994,080	$3,463,160	$415,517,984
2023	$344,710,511	$137,001,267	$4,256,739	$485,968,518
2024	$389,542,814	$165,291,988	$5,011,543	$559,846,346
2025	$434,352,476	$193,732,844	$5,679,103	$633,764,423
2026	$479,731,332	$223,532,953	$6,245,616	$709,509,902
2027	$524,893,557	$254,850,429	$6,706,155	$786,450,141
2028	$570,932,645	$287,733,003	$7,062,527	$865,728,175
2029	$617,327,373	$322,345,390	$7,336,747	$947,009,510
2030	$662,948,521	$358,153,771	$7,538,345	$1,028,640,638
2031	$709,281,389	$395,700,274	$7,684,903	$1,112,666,567
2032	$756,752,309	$435,119,322	$7,788,742	$1,199,660,373
2033	$806,006,911	$476,418,473	$7,863,992	$1,290,289,377

Table 5-12. Cumulative RAP Budget ($) -- KCP&L MO

KCP&L MO	Energy Efficiency	Demand Response	CHP	Total
2014	$13,789,783	$4,114,225	$31,623	$17,935,631
2015	$31,608,553	$10,541,321	$161,276	$42,311,151
2016	$54,062,346	$17,915,406	$294,092	$72,271,844
2017	$81,370,496	$26,858,809	$689,378	$108,918,683
2018	$113,318,072	$36,575,376	$1,223,804	$151,117,251
2019	$148,682,142	$47,494,740	$1,900,532	$198,077,414
2020	$186,162,040	$59,647,161	$2,731,987	$248,541,188
2021	$223,769,842	$73,069,301	$3,703,034	$300,542,177
2022	$260,148,340	$87,790,210	$4,761,044	$352,699,593
2023	$294,675,034	$103,860,589	$5,852,032	$404,387,654
2024	$327,212,462	$121,317,514	$6,889,712	$455,419,688
2025	$357,677,173	$138,103,840	$7,807,452	$503,588,466
2026	$387,847,657	$155,555,730	$8,586,277	$551,989,665
2027	$417,481,200	$173,709,466	$9,219,412	$600,410,077
2028	$446,492,594	$192,172,113	$9,709,340	$648,374,046

2029	$475,006,592	$211,325,815	$10,086,329	$696,418,737
2030	$502,419,291	$231,196,651	$10,363,481	$743,979,422
2031	$529,799,330	$251,804,672	$10,564,963	$792,168,966
2032	$557,355,666	$273,152,757	$10,707,718	$841,216,141
2033	$585,474,768	$295,311,650	$10,811,170	$891,597,587

Table 5-13. Cumulative RAP Budget ($) -- KCP&L KS

KCP&L KS	Energy Efficiency	Demand Response	CHP	Total
2014	$9,654,778	$5,672,052	$5,559	$15,332,389
2015	$22,524,951	$12,082,050	$28,352	$34,635,353
2016	$38,681,446	$17,988,131	$51,701	$56,721,277
2017	$58,228,372	$24,891,860	$121,191	$83,241,423
2018	$81,046,951	$31,758,078	$215,142	$113,020,171
2019	$106,396,767	$39,017,432	$334,109	$145,748,308
2020	$133,409,682	$46,643,152	$480,277	$180,533,112
2021	$160,822,478	$54,165,962	$650,985	$215,639,426
2022	$187,669,652	$62,371,338	$836,981	$250,877,971
2023	$213,654,458	$71,259,800	$1,028,774	$285,943,033
2024	$238,565,953	$80,841,373	$1,211,196	$320,618,523
2025	$262,311,627	$91,488,360	$1,372,533	$355,172,520
2026	$286,107,291	$102,546,428	$1,509,449	$390,163,168
2027	$309,286,362	$114,077,010	$1,620,753	$424,984,125
2028	$332,248,956	$125,698,721	$1,706,881	$459,654,558
2029	$354,976,057	$137,749,161	$1,773,155	$494,498,373
2030	$377,167,489	$150,261,042	$1,821,877	$529,250,408
2031	$399,517,238	$163,250,254	$1,857,298	$564,624,789
2032	$422,135,114	$176,730,718	$1,882,393	$600,748,226
2033	$445,184,970	$190,740,954	$1,900,580	$637,826,503

Appendix A. Measure Characterization Data

This appendix is provided as a separate Excel spreadsheet and contains all characterization data listed in Section 2.2.2 (i.e. energy, demand, costs, and densities) for every measure at the customer segment level.

Appendix B. Onsite Data Collection

B.1 Data Sources

The on-site surveys collected primary data from KCP&L residential, commercial and industrial facilities in designated regions. The on-site surveys focused principally on in-depth and accurate data collection of equipment and building envelope by inspection of professionally trained surveyors. Together these sources reflect the 2012 baseline efficiency of KCP&L customers. The on-site survey participants were recruited randomly from a stratified sample of KCP&L customers.

B.2 Sampling Approach

The on-site survey sample was designed to represent a broad cross section of KCP&L customers and to achieve a reasonable confidence interval and margin of error. For the residential sector, Navigant considered energy usage as well as single family and multi-family segmentation. For the C&I sector, Navigant considered energy usage and business type as the primary sampling dimensions. Customer data from all residential and C&I customers was collected from KCP&L and GMO. The following sections show the resulting stratified sample design.

C&I On-Site Survey Samples

A stratified ratio estimation method was used for the C&I sample design. Both stratification and ratio estimation take advantage of available information per account, in this case, energy use per account. Thus the sample design is determined by building type/industry and account usage. Unlike the residential sector, accounts in the commercial and industrial sectors range widely in terms of energy use: most accounts have low energy use and few accounts have high energy use. Here, simple random sampling methods by account would not be representative.

Rather, stratifying by energy use reduces the coefficient of variation of energy use in each stratum and thus improves statistical precision. Additionally, for this sample design, Navigant determined a relatively small sample of low energy use accounts and a relatively large sample of high energy use accounts. For the commercial and industrial sample, sites were stratified by energy usage into two groups: strata 1 and strata 2. C&I sites were placed into strata 1 if their average monthly kWh was 50,000 or higher. Strata 2 consisted of sites with an average monthly kWh of less than 50,000. Both strata included the selected building types for both commercial and industrial segments. The Navigant team targeted a total of 102 sites in Strata 1 and 38 in Strata 2 leading to an overall sample goal of 140 completed C&I sites. This number of surveys was targeted to provide statistical confidence of 90% and +/- 10% precision or margin of error (90/10) for the C&I sector as a whole.

Then, the sample was segmented by commercial and industrial designations using SIC code mapping. This consists of SIC code descriptions lining up with commercial or industrial sector descriptions as well as market sector building types. This segmentation resulted in a sample of 98 total commercial sites and 42 total industrial sites.

The following tables show the targeted segmentation for the C&I sample:

Table B- 1. Original Targeted C&I Sample Draw

KCP&L DSM Potential Study CnI On-site Sample Plan

		Strata I					Strata II					Planned Size
		Sites	kwh %	Approachable Sites	Selected	Target Size	Sites	kwh %	Approachable Sites	Selected	Target Size	
Commercial	College	62	90%	56	19	4	83	10%	77	8	2	6
	Grocery	107	77%	95	55	4	412	23%	299	160	2	6
	Healthcare	257	92%	216	149	7	476	8%	311	144	2	9
	Lodging	115	90%	99	75	4	136	10%	108	64	2	6
	Office - Large	98	67%	84	63	6	368	33%	314	146	3	9
	Office - Small	1114	65%	829	157	15	2,859	35%	1995	104	8	23
	Other Commercial	617	75%	496	172	6	2,271	25%	1386	142	3	9
	Restaurant	671	74%	508	138	4	1,045	26%	637	142	2	6
	Retail	629	80%	536	138	7	1,633	20%	1059	151	2	9
	School	452	88%	423	71	7	500	12%	427	75	2	9
	Warehouse	281	79%	213	166	4	797	21%	380	146	2	6
Industrial	Chemicals	29	95%	26	20	7	87	5%	60	35	0	7
	Electronics	10	94%	10	9	3	64	6%	41	20	2	5
	Food	32	95%	31	25	7	92	5%	63	46	0	7
	Motor Freight Transportation	76	89%	63	42	3	209	11%	136	83	2	5
	Other Industrial	441	86%	399	164	6	1,388	14%	924	140	2	8
	Rubber-Plastics	15	94%	14	12	3	36	6%	27	16	2	5
	Stone-Clay-Glass	6	97%	6	6	5	42	3%	25	21	0	5
Total		5,012	81%	4,104	1,481	102	12,498	19%	8,269	1,643	38	140

Table B- 2. Targeted C&I Sample Summary

Sector	Strata 1	Strata 2	Total
Commercial	68	30	98
Industrial	34	8	42
Total	**102**	**38**	**140**

The following tables summarize the results of the on-site data collection efforts for the commercial and industrial site visits. Table B- 3 compares the targeted to actual sample sizes by sector, building type and stratum. Navigant surveyed 139 C&I buildings across 18 building types and two strata.

Table B- 3. Comparison of Targeted to Actual C&I Site Visits

Sector	Building Type	On-Site Surveys (Target / Actual)		
		Target/Actual Strata 1	Target/Actual Strata 2	Target/Actual Total
Commercial	College	4/4	2/2	6/6
	Grocery	4/4	2/4	6/8
	Healthcare	7/7	2/2	9/9
	Lodging	4/4	2/2	6/6
	Office - Large	6/5	3/2	9/7
	Office - Small	15/13	8/8	23/21
	Other Commercial	6/6	3/4	9/9
	Restaurant	4/4	2/3	6/7
	Retail	7/7	2/2	9/9
	School	7/7	2/2	9/9
	Warehouse	4/4	2/2	6/6
	Commercial Total	**68/65**	**30/33**	**98/97**
Industrial	Chemicals	7/3	0/0	7/3
	Electronics	3/1	2/2	5/3
	Food	7/5	0/4	7/9
	Motor Freight Transportation	3/2	2/0	5/2
	Other Industrial	6/9	2/4	8/13
	Rubber-Plastics	3/4	2/5	5/9
	Stone-Clay-Glass	5/1	0/2	5/3
	Industrial Total	**34/25**	**8/17**	**42/42**
TOTAL		**102/90**	**38/50**	**140/139**

Table B- 4 shows the distribution of targeted and completed sites across the building types.

Table B- 4. Summary of Total C&I Site Visits by Building Type

Sector	Building Type	Number of Targeted Sites	Number of Completed Sites	Percent of Total Sample (Completed Sites)
Commercial	College	6	6	4%
	Grocery	6	8	6%
	Healthcare	9	9	6%
	Lodging	6	6	4%
	Office - Large	9	7	5%
	Office - Small	23	21	15%
	Other Commercial	9	9	6%
	Restaurant	6	7	5%
	Retail	9	9	6%
	School	9	9	6%
	Warehouse	6	6	4%
	Commercial Total	**98**	**97**	**67%**
Industrial	Chemicals	7	3	2%
	Electronics	5	3	2%
	Food	7	9	6%
	Motor Freight Transportation	5	2	1%
	Other Industrial	8	13	9%
	Rubber-Plastics	5	9	6%
	Stone-Clay-Glass	5	3	2%
	Industrial Total	**42**	**42**	**28%**
TOTAL		**140**	**139**	**95%**

Table B- 5 summarizes the completed on-site visits across the two consumption strata.

Table B- 5. Summary of Completed Site Visits by Consumption Stratum

Consumption Stratum	Consumption Stratum	Number of Completed Sites in Stratum	Percent of Total Sample
1	Large Commercial	68	49%
	Large Industrial	34	24%
2	Small Commercial	30	21%
	Small Industrial	8	6%
Total		**140**	**100%**
Source: Navigant on-site surveys			

Table B- 6 and Table B- 7 show the final on-site sample results by sector, building type and strata, as well as weightings used to extrapolate the results of the on-site surveys to the population. Weighting Factors are defined as *Population Size/Sample Size* for the number of sites.

Table B- 6. Final Commercial On-Site Sample Results and Weightings

	Area	Strata	Population Size	Target Sample Size	Final Sample Size	Weighting factor
Commercial	College	1	62	4	4	15.5
	College	2	83	2	2	41.5
	Grocery	1	107	4	4	26.8
	Grocery	2	412	2	4	103.0
	Healthcare	1	257	7	7	36.1
	Healthcare	2	476	2	2	239.0
	Lodging	1	115	4	4	28.8
	Lodging	2	136	2	2	68.0
	Office - Large	1	98	6	5	19.6
	Office - Large	2	368	3	2	184.0
	Office - Small	1	1,114	15	13	85.69
	Office - Small	2	2,859	8	8	357.4
	Other Commercial	1	617	6	6	102.8
	Other Commercial	2	2,271	3	3	567.8
	Restaurant	1	671	4	4	167.8
	Restaurant	2	1,045	2	3	348.3
	Retail	1	629	7	7	89.9
	Retail	2	1,633	2	2	816.5
	School	1	452	7	4	64.57
	School	2	500	2	2	250.0
	Warehouse	1	281	4	4	70.3
	Warehouse	2	797	2	2	398.5
	Total		**14,983**	**98**	**97**	

Table B- 7. Final Industrial On-Site Sample Results and Weightings

	Area	Strata	Population Size	Target Sample Size	Final Sample Size	Weighting factor
Industrial	Chemicals	1	29	7	3	9.67
	Chemicals	2	87	0	0	NA
	Electronics	1	10	3	1	10.0
	Electronics	2	644	2	2	32.0
	Food	1	32	7	5	6.4
	Food	2	92	0	4	23.0
	Motor Freight Transportation	1	76	3	2	38.0
	Motor Freight Transportation	2	209	2	0	NA
	Other Industrial	1	441	6	9	49.0
	Other Industrial	2	1,388	2	4	347.0
	Rubber-Plastics	1	15	3	4	3.8
	Rubber-Plastics	2	36	2	5	7.2
	Stone-Clay-Glass	1	6	5	1	6.0
	Stone-Clay-Glass	2	42	0	2	21.0
	Total		3107	42	42	

Final C&I Reporting Segments

Navigant presents the results of this baseline study according to designated reporting segments, illustrated in Table B- 8.

Table B- 8. C&I Reporting Segments for Building Type

Sector	Building Type	On-Site Survey Count	Total Weighted (sq. ft.)	Sq. ft. % of Overall Population
Commercial	College	6	10,360,238.5	0.02
	Grocery	8	5,162,894.5	0.01
	Healthcare	9	9,719,175.6	0.02
	Lodging	6	9,791,255	0.02
	Office - Large	7	53,425,365.2	0.12
	Office - Small	21	40,007,351.2	0.09
	Other Commercial	9	42,819,822.8	0.10
	Restaurant	7	6,533,482.1	0.01
	Retail	9	23,608,059.9	0.05
	School	9	45,909,581.4	0.10
	Warehouse	6	25,074,850	0.06
Industrial	Chemicals	3	2,421,500	0.01
	Electronics	3	10,077,000	0.02
	Food	9	7,361,064.8	0.02
	Motor Freight Transportation	2	9,500,000	0.02
	Other Industrial	13	136,789,496	0.31
	Rubber-Plastics	9	5,344,848	0.01
	Stone-Clay-Glass	3	284,256	0.00
	Total	**139**	**444,190,241**	**0.97**

Residential On-Site Survey Samples

The Navigant team targeted 70 residences and completed on-site surveys at 69 residences consisting of 14 multi-family sites and 55 single family sites. This number of surveys was targeted to provide statistical confidence of 90% and +/- 10% precision or margin of error (90/10) for the residential sector across KS and MO.

Table B- 9. Original Targeted Residential Sample Draw

KCPL Potential Residential Sample Design										
	kWh (%)	Strata 1				Strata 2				Planned Size
		Sites	kWh %	Selected	Target	Sites	kWh %	Selected	Target	
Multi-Family	14%	29,558	50%	700	7	56,610	50%	700	7	14
Sing-Family	86%	136,333	55%	700	31	235,453	45%	700	25	56
Total	100%	165,891	54%	1,400	38	292,063	46%	1,200	32	70

The following tables summarize the results of the on-site data collection efforts for the residential site visits. Table B- 10 compares the targeted to actual sample sizes by area and stratum. Navigant surveyed 69 existing buildings across two sample sectors and two strata. Navigant defined the sample areas as single family and multi-family homes. These designations were constructed from premise type mapping to family home type. Multi-family homes were defined as homes included in a structure of three or more units, such as an apartment or duplex. Navigant divided the two strata based on annual electric energy use, where Strata 1 is the higher energy users and Strata 2 is the lower energy users.

Table B- 10. Comparison of Targeted to Actual Residential Site Visits

Building Type	On-Site Surveys (Target / Actual)		
	Target/Actual Strata 1	Target/Actual Strata 2	Target/Actual Total
Multi-family	7/6	7/ 8	14/14
Single family	31/31	25/24	56/55
Total	**38/37**	**32/32**	**70/69**

Table B- 11 shows the distribution of targeted and completed sites across the building types.

Table B- 11. Summary of Site Visits by Sample Area

Building Type	Number of Targeted Sites	Number of Completed Sites	Percent of Total Sample (Completed Sites)
Multi-family	14	13	20%
Single family	56	56	80%
Total	**70**	**69**	**100%**

Table B- 12 shows the final on-site sample results by sample area and strata, as well as weightings used to extrapolate the results of the on-site surveys to the population. Weighting factors are defined as *Population Size/Sample Size* for the number of sites.

Table B- 12. Final Residential On-Site Sample Results and Weightings

Sector	Strata	Population Size	Target Sample Size	Final Sample Size	Weighting Factor
Single family	1	136,333	31	31	4,398
Single family	2	235,453	25	24	9,811
Multi-family	1	29,558	7	6	4,926
Multi-family	2	56,610	7	8	7,076
Total		**457,954**	**70**	**69**	**13,611**

Final Residential Reporting Segments

Navigant presents the results of this baseline study according to designated reporting segments, illustrated in Table B- 13.

Table B- 13. Reporting Segments for Residential On-sites

Building Type	On-Site Survey Count	Total Weighted (count of homes)
Single family	55	371,786
Multi-family	14	86,168
Total	**69**	**457,954**

B.3 Data Collection Approach

All survey participants were recruited at random according to the stratified sample designs. Forms for all surveys are included in the appendices.

C&I On-Site Surveys

Professionally trained surveyors surveyed the sites of 139 C&I customers, 97 commercial and 42 industrial, which were randomly recruited by telephone according to the stratified sample design. The surveyors collected detailed inventories of energy-using equipment and building characteristics by inspection and, at some of the larger sites, by customer-provided schedules of equipment. Surveyors also collected operation and power management behavior by interview including specifics on combined heat and power, if present.

The site inspection covered all relevant energy aspects of customer facilities and businesses:

» Building size and orientation

» Building envelope information, such as insulation levels and wall and window sizes

» Complete inventories of energy-using equipment covering all end uses, including lighting, HVAC, motors, water heating, commercial refrigeration, cooking, office equipment, air compressors, and other types of process equipment

» Equipment and operation schedules and controls

Table B- 14 shows the response rate for scheduling the C&I on-site surveys. The scheduling team successfully contacted 53% of the sample, with 83% refusing to participate and 17% successfully scheduling a site visit.

Table B- 14. C&I On-Site Survey Response Rates

	Total Counts	Percentage
Total Sample	3123	
Total Customers Dialed	1515	49%
Total Customers Reached	797	53%
Refused	658	83%
Completed	139	17%
Source: On-site survey scheduling disposition		

Residential On-Site Surveys

Professionally trained surveyors surveyed the sites of 69 KCP&L residential customers that were randomly recruited by telephone according to the stratified sample design. Surveyors conducted a brief interview with the customer regarding occupancy information and age of the home. The surveyors collected detailed inventories of energy-using equipment and building characteristics by inspection.

The inspection covered all relevant energy aspects of the home:

» Home size and orientation

» Building envelope information, such as insulation levels and wall and window sizes

» Complete inventories of energy-using equipment covering all end uses, including lighting, HVAC, motors, water heating, refrigeration, cooking, and electronic equipment

Surveyors used various tools for their inventory, including hot water thermometer, metered water container, and measuring tape. In addition, surveyors collected information on household characteristics, equipment usage, and maintenance from the resident.

Table B- 15 shows the response rate for scheduling the residential on-site surveys. The scheduling team successfully contacted 50% of the sample, with 34% refusing to participate and 24% successfully scheduling a site visit.

Table B- 15. Residential On-Site Survey Response Rates

	Total Counts	Percentage
Total Sample	2598	
Total Customers Dialed	583	22%
Total Customers Reached	293	50%
Refused	101	34%
Completed	70	24%
Source: On-site survey scheduling disposition		

Appendix C. Loadshape Data

This appendix is provided as two separate Excel files (one for residential and one for commercial/industrial) that contain loadshapes used to allocate energy savings across months, on/off peak periods, and weekend/weekday for each end-use and sector.

Appendix D. Statistical Estimation of the Parametric Payback Functions

The payback data obtained from the surveys of the residential, commercial, and industrial sectors were used to develop payback functions that express the share of the market that can be captured by an energy efficient technology with a payback time of t. We call these functions "payback curves" and express them as $F(t;b)$, where b is the set of parameters defining *F*. Denoting by $C(t;b)$ the cumulative distribution function expressing the share of the market that would *not* purchase an energy efficient device if the payback period were t, $F(t;b) = 1 - C(t;b)$. In other words, the payback curve is a mirror of a cumulative distribution function; it starts along the vertical axis at 1 and falls to 0.[60]

We use two approaches for estimating the payback function *F*(t). With t measured in years, the first simply plots the proportion of respondents adopting a technology with a payback time equal to t=0,1,2,3, etc., and interpolates linearly between each point. This approach is called "semi-parametric" because it makes no parametric assumptions about the shape of the payback curve except as expressed in linear interpolation between the market shares calculated from the data for each whole year. So, for instance, for the commercial sector about 45% of survey respondents indicate a payback period ≥5 years, and about 35% indicate a payback period ≥6 years, and so the semi-parametric version of *F(t)* includes the data points .45(5) and .35(6) and the line between these points.

The advantage of the semi-parametric approach is that it imposes minimal assumptions about the functional form of the payback function. Its disadvantage, though, is that hypothesis testing, such as whether the payback functions for KCPL and GMO are different, or whether the payback functions for owner-occupied and landlord-owned residential units are different, is cumbersome and conceptually nuanced.[61]

In the alternative approach –parametric estimation of payback functions—a parametric functional form of the payback function is assumed and the function parameters are econometrically estimated. Hypothesis testing is straightforward under the maintained assumption that the functional form is correct.

It is possible that the payback function depends on a set of variables *X*, such as demographic variables, in which case the parametric payback function is expressed as $F(t, X; b)$. For instance, household income might affect the payback function in the residential sector. As described below, it is possible to statistically test whether *F* does indeed depend on a given *X*. Regardless, ultimately we are interested in the value of $F(t, X; b)$ averaged over X in the population: $F(t;b) = \int_X F(t, X; b) g(X) dX$, where g is the population density function for X. In other words, we are interested in the population-weighted average payback curve.

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[60] If the payback curve intersects the vertical axis at less than 1, the difference between 1 and the intercept indicates the proportion of the market that would never purchase the technology.

[61] For instance, it's conceivable that a comparison of two non-parametric payback functions generates the result that they are statistically different at year 1, not statistically different at Year 2, statistically different at Year 3, and so on.

With respect to statistically identifying a parametric form of the function $F(t, X; b)$, we address the question, "within a particular class of parametric distribution functions, what is the distribution function $C(t, X; b) = 1 - F(t, X; b)$ *most likely* to have generated the observed data {t,X} obtained from the survey data?" This is the question addressed by maximum likelihood estimation (MLE). For instance, if we assume that $C(t, X; b)$ takes the form of a cumulative normal distribution with mean $m = aX$ and variance s, standard OLS (with t as the dependent variable) generates the estimate of $F(t, X; b = \{a, s\})$ most likely to have generated the observed data. In other words, OLS generates MLE estimates under the assumption of normality.

After reviewing histograms of the survey data, Navigant decided to fit payback functions based on the gamma distribution to the payback data for the residential sector, and to fit payback functions based on the normal distribution to the payback data for the commercial and residential sectors. Figure D- 1 through Figure D-4 compare the payback curves generated by these models to their non-parametric counterparts. The figures indicate that parametric and non-parametric payback curves are generally quite similar.

Table D- 1and Table D- 2 provide results for parametric models for homeowner payback functions in which the payback function is extended to include a set of demographic variables X, $F(t, X; b)$.[62] Variables include the following:

Age = age of respondent;

Education = years of schooling by respondent;

Income = respondent annual income;

Female = indicator for respondent gender, with Female=1 indicating female and Female=0 indicating male.

GMO = indicator variable taking a value of 1 if the observation is in the GMO service territory, and 0 if it is in the KCP&L service territory.

Summarizing the results from these extended models:

- For low-cost devices, none of the demographic variables examined has a statistically significant effect on the homeowner payback function;
- For high-cost devices, education *increases* the required payback time for homeowners. None of the other demographic variables affect the payback time.[63]
- In none of the extended models does location in GMO vs. KCP&L have a statistically significant effect on the payback function.

[62] All parametric models were estimated using the SAS GENMOD procedure.
[63] Note that the homeowner payback curves account for the effect of education by virtue of the census weighting of the data.

Table D- 1. Effect of demographic variables on the payback function, homeowners, low-cost devices

Parameter	Estimate	Standard Error	95% Confidence Limits	
Intercept	1.250	0.055	1.142	1.358
Age	-0.002	0.004	-0.009	0.005
Education	0.087	0.129	-0.166	0.340
Income	0.008	0.017	-0.024	0.041
Female	-0.065	0.111	-0.281	0.152
GMO	0.103	0.110	-0.113	0.319

Table D- 2. Effect of demographic variables on the payback function, homeowners, high-cost devices

Parameter	Estimate	Standard Error	95% Confidence Limits	
Intercept	1.530	0.207	1.124	1.936
Age	-0.001	0.004	-0.008	0.006
Education	0.268	0.125	0.024	0.513
Income	-0.007	0.016	-0.038	0.024
Female	-0.021	0.106	-0.229	0.188
GMO	0.134	0.105	-0.072	0.341

Figure D- 1. Residential sector payback curves for high-cost devices

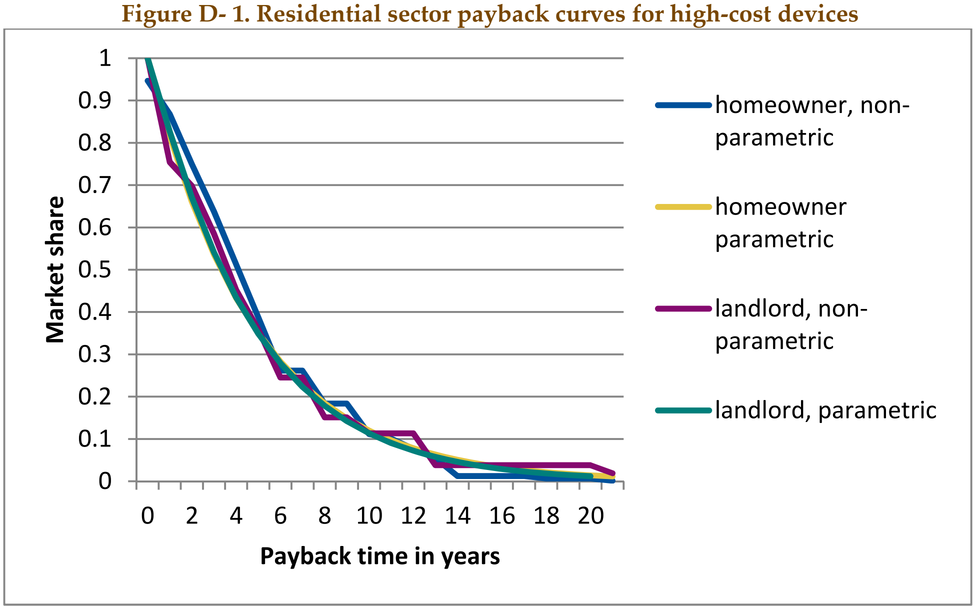


Figure D- 2. Residential sector payback curves for low-cost devices

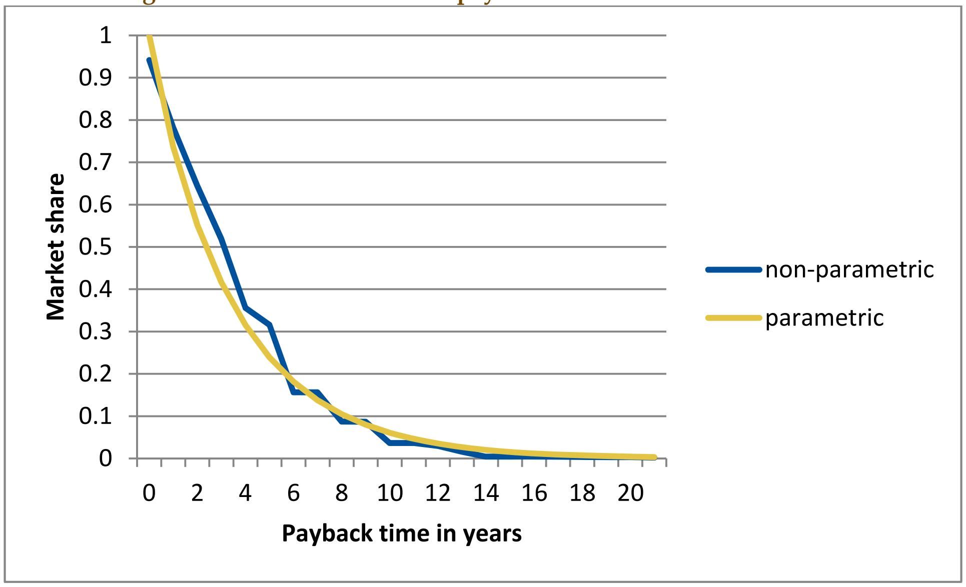


Figure D- 3. Commercial sector payback curves

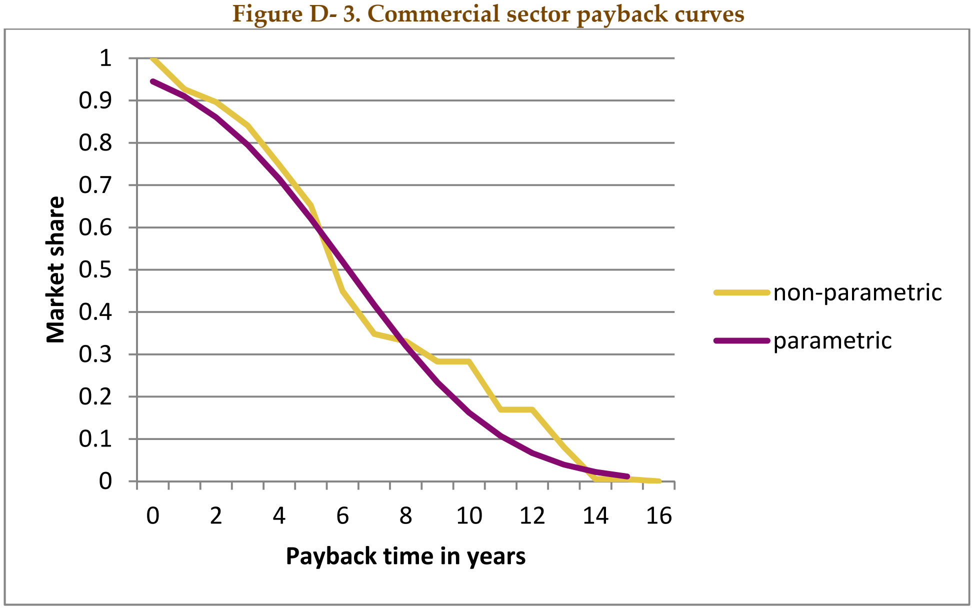
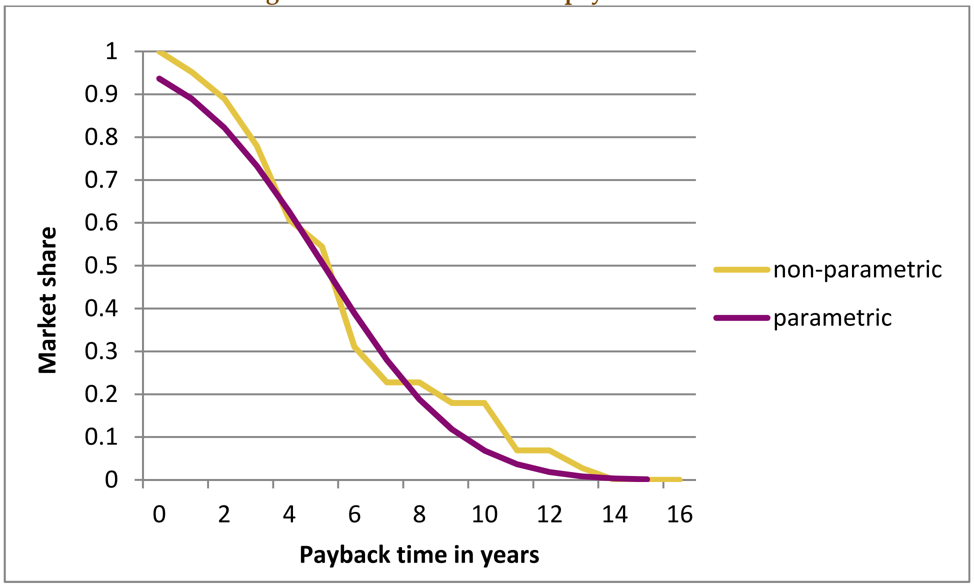


Figure D- 4. Industrial sector payback curves



Appendix E. Owner-Occupied Payback Acceptance Survey – Low Cost

I. Introduction to the Study

A local electric utility is interested in determining whether residential customers believe that the energy savings from energy efficient appliances are worth the additional cost of the appliance. The utility wants this information to help it design future energy efficiency programs in its service territory.

The questions will take about 10 minutes to answer. Thank you for your time on this survey.

II. Initial Questions

1. Which of the following devices and appliances do you own? (All answers: Y/N/DK/NR)

- *a. Power strip for computer and other electronic equipment*
- *b. DVD or Blu-Ray player*
- *c. Dishwasher*
- *d. Refrigerator*
- *e. Central air conditioning*
- *f. Large TV (greater than 40")*

2. Is your water heater electric or natural gas?

- *a. Electric*
- *b. Natural gas*
- *c. Don't know*

III. WTP Question 1 . *Randomly choose from the set of questions in Appendix A based on responses to questions 1a-b of part II. The feasible set for the random draw is defined as follows:*

- *Questions A1(a,b) concerning lighting are always feasible.*
- *Questions A2(a,b) are feasible if question II.1a is "Yes".*
- *Questions A3(a,b) are feasible if question II.1b is "Yes".*

IV. WTP Question 2 . *Randomly choose from the set of questions in Appendix B based on responses to questions 1c-f and question 2 of part II. The feasible set for the random draw is defined as follows:*

- *Questions B1(a,b) are feasible if question II.1c is "Yes"* ***and question II.2 is "Electric"****.*
- *Questions B2(a,b) are feasible if question II.1d is "Yes".*
- *Questions B3(a,b) are feasible if question II.1e is "Yes"*
- *Questions B4(a,b) are feasible if question II.1f is "Yes"*

V. Demographics

We now want to ask you some demographic questions about your household. We ask these questions to check that we have a representative sample for our study. [Standard demographic questions here].

Owner-Occupied Survey, Appendix A

EVERY RESPONDENT GETS ONE QUESTION FROM THIS APPENDIX—that is one question from the set [Lighting 1, Lighting 2, Power strip 1, Power strip 2, DVD 1, DVD 2] –BASED ON THE RESPONSES TO QUESTION II.1(a,b) IN SECTION 1. THAT IS, RESPONSES TO QUESTION II.1(a,b)

ARE THE BASIS FOR THE SET OF FEASIBLE QUESTIONS IN THIS APPENDIX FROM WHICH A RANDOM DRAW IS MADE.

A1(a). Lighting question I

Now we want to ask you about your likely decision in the event you need to buy a new light bulb. Please think about a particular socket in your living space that you use fairly often.

Suppose the bulb burns out and you're at the store shopping for a new one. You have in mind a particular type of bulb, a particular wattage, etc. You find the bulb you need, and there is a standard version and anenergy efficient version. Assume there is no difference in the quality of lighting between the two versions. In other words, the energy efficient version looks just like the standard version of the light bulb, and has the exact same quality of light. It's just more energy efficient.

The energy efficient version would save you ***$1 per year*** *in electricity costs compared to a standard version,* ***but is more expensive to buy****.*

Would you be willing to pay the following ***additional*** *amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $3, you are saying that you would not pay $3 more for the energy efficient version.*

$0 (the energy efficient light bulb is no more expensive than the standard bulb)	*□Yes*	*□ No*
$1	*□Yes*	*□ No*
$2	*□Yes*	*□ No*
$3	*□Yes*	*□ No*
$4	*□Yes*	*□ No*
$5	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$8	*□Yes*	*□ No*
$10	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
More than $12	*□Yes*	*□ No*

If this question is the second of the two questions asked:

On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient light bulb:
It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

A1(b). Lighting question 2

Now we want to ask you about your likely decision in the event you need to buy a new light bulb. Please think about a particular socket in your living space that you use fairly often.

Suppose the bulb burns out and you're at the store shopping for a new one. You have in mind a particular type of bulb, a particular wattage, etc. You find the bulb you need, and there is a standard version and an energy efficient version. Assume there is no difference in the quality of lighting between the two versions. In other words, the *energy efficient version looks just like the standard version of the light bulb, and has the exact same quality of light. It's just more energy efficient.*

*The energy efficient version would save you **$3 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $12, you are saying that you would not pay $12 more for the energy efficient version.*

$0 (the energy efficient charger is no more expensive than the standard one)	*□Yes*	*□ No*
$3	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$9	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$18	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$30	*□Yes*	*□ No*
$45	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
More than $60	*□Yes*	*□ No*

If this question is the second of the two questions asked:
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient light bulb:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

A2(a). Power strip question 1

Now we want to ask you about your likely decision in the event you need to buy a new power strip because the old one breaks and can't be repaired.

Power strips typically cost in the neighborhood of $5-$40, depending on the number outlets and styling (shape, color).

Suppose that you've found the power strip that suits your needs.

*There are **two versions of the power strip:** A standard version and a "smart" version that reduces the electricity draw from an outlet when the devices plugged into it are not being used, and allows electricity to flow again when the devices are turned on. Generally there is no noticeable difference in the quality of the standard and "smart" versions. In other words, the smart version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$1 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $3, you are saying that you would not pay $3 more for the energy efficient version.*

$0 (the energy efficient charger is no more expensive than the standard version)	*□Yes*	*□ No*
$1	*□Yes*	*□ No*
$2	*□Yes*	*□ No*
$3	*□Yes*	*□ No*
$4	*□Yes*	*□ No*
$5	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$8	*□Yes*	*□ No*
$10	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
More than $12	*□Yes*	*□ No*

If this question is the second of the two questions asked:
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase a "smart" power strip:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I don't plan on keeping my current phone long enough to make the investment in an energy efficient charger worthwhile
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

A2(b). Power strip question 2

Now we want to ask you about your likely decision in the event you need to buy a new power strip because the old one breaks and can't be repaired.

Power strips typically cost in the neighborhood of $5-$40, depending on the number outlets and styling (shape, color).

Suppose that you've found the power strip that suits your needs.

*There are **two versions of the power strip:** A standard version and a "smart" version that reduces the electricity draw from an outlet when the devices plugged into it are not being used, and allows electricity to flow again when the devices are turned on. Generally there is no noticeable difference in the quality of the standard and "smart" versions. In other words, the smart version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$3 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $3, you are saying that you would not pay $3 more for the energy efficient version.*

$0 (the energy efficient charger is no more expensive than the standard one) □Yes □ No

$3	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$9	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$18	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$30	*□Yes*	*□ No*
$45	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
More than $60	*□Yes*	*□ No*

If this question is the second of the two questions asked:

On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase a "smart" power strip:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I don't plan on keeping my current phone long enough to make the investment in an energy efficient charger worthwhile
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

A3(a). DVD and Blu-Ray question 1

Now we want to ask you about your likely decision in the event you needed to buy a new DVD or Blu Ray player because your current one breaks down and can't be repaired.

DVD players typically cost in the neighborhood of $50-$300, though there is wide variation in cost, depending on styling, whether it plays Blu-Ray discs, and features such as.

Suppose that you've identified the DVD or Blu-Ray player that you prefer and that you can afford.

*There are **two versions of the player:** A standard version and a more energy efficient version. Assume there is no difference in the quality of the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$3 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $18, you are saying that you would not pay $18 more for the energy efficient version.*

$0 (the energy efficient charger is no more expensive than the standard one) □Yes □ No

$3	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$9	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$15	*□Yes*	*□ No*
$18	*□Yes*	*□ No*

$24	*□Yes*	*□ No*
$30	*□Yes*	*□ No*
$36	*□Yes*	*□ No*
More than $36	*□Yes*	*□ No*

If this question is the second of the two questions asked, ask the following questions:
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient DVD player:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

A3(b). DVD and DVD/Blu-Ray question 2

Now we want to ask you about your likely decision in the event you needed to buy a new DVD or Blu Ray player because your current one breaks down and can't be repaired.

DVD players typically cost in the neighborhood of $50-$300, though there is wide variation in cost, depending on styling, whether it plays Blu-Ray discs, and features such as.

Suppose that you've identified the DVD or Blu-Ray player that you prefer and that you can afford.

*There are **two versions of the player:** A standard version and a more energy efficient version. Assume there is no difference in the quality of the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$6 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $12, you are saying that you would not pay $12 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version) □Yes □ No

$6	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$18	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$36	*□Yes*	*□ No*
$48	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
$90	*□Yes*	*□ No*
$120	*□Yes*	*□ No*
More than $120	*□Yes*	*□ No*

If this question is the second of the two questions asked, ask the following questions:
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient DVD player:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

Appendix F. Owner-Occupied Payback Acceptance Survey – High Cost

EVERY RESPONDENT GETS ONE QUESTION FROM THIS APPENDIX, BASED ON THE RESPONSES TO QUESTIONS II.1(c-e) and question II.2 IN SECTION 1. THOSE RESPONSES ARE THE BASIS FOR THE SET OF FEASIBLE QUESTIONS IN THIS APPENDIX FROM WHICH A RANDOM DRAW IS MADE.

B1(a). Dishwasher question 1

Now we want to ask you about your likely decision in the event you needed to buy a new dishwasher because your current one breaks down and can't be repaired.

Dishwashers typically cost in the neighborhood of $700-$800, though there is a wide variation in cost, depending on features such as size, noisiness, style (portable vs. undercounter, brushed steel vs. plastic, etc.), and the availability of features such as delayed-start and hard food disposer.

Suppose that you've identified the dishwasher you prefer and that you can afford.

*There are **two versions of the dishwasher:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$6 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $12, you are saying that you would not pay $12 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version) □Yes □ No

$6	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$18	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$30	*□Yes*	*□ No*
$36	*□Yes*	*□ No*
$48	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
$72	*□Yes*	*□ No*
More than $72	*□Yes*	*□ No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient dishwasher:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B1(b). Dishwasher question 2

Now we want to ask you about your likely decision in the event you needed to buy a new dishwasher because your current one breaks down and can't be repaired.

Dishwashers typically cost in the neighborhood of $700-$800, though there is a wide variation in cost, depending on features such as size, noisiness, style (portable vs. undercounter, brushed steel vs. plastic, etc.), and the availability of features such as delayed-start and hard food disposer.

Suppose that you've identified the dishwasher you prefer and that you can afford.

*There are **two versions of the dishwasher:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$12 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $72, you are saying that you would not pay $72 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version) □Yes □ No

$6	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$36	*□Yes*	*□ No*
$48	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
$72	*□Yes*	*□ No*
$96	*□Yes*	*□ No*
$120	*□Yes*	*□ No*
$144	*□Yes*	*□ No*
More than $144	*□Yes*	*□ No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient dishwasher:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B2(a). Refrigerator question 1

Now we want to ask you about your likely decision in the event you needed to buy a new refrigerator because your current one breaks down and can't be repaired.

Refrigerators typically cost in the neighborhood of $900-$1100, though there is a wide variation in cost, depending on features such as size, style (the freezer compartment is at the bottom vs. the top, brushed steel vs. painted, etc.), and the availability of features such ice maker, chilled water dispenser, and so forth.

Suppose that you've identified the refrigerator that you prefer and that you can afford.

*There are **two versions of the refrigerator:** A standard version and an energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$12 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $24, you are saying that you would not pay $24 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version) □Yes □ No

$12	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$36	*□Yes*	*□ No*
$48	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
$72	*□Yes*	*□ No*
$96	*□Yes*	*□ No*
$120	*□Yes*	*□ No*
$144	*□Yes*	*□ No*
More than $144	*□Yes*	*□ No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient refrigerator:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices;.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B2(b). Refrigerator question 2

Now we want to ask you about your likely decision in the event you needed to buy a new refrigerator because your current one breaks down and can't be repaired.

Refrigerators typically cost in the neighborhood of $900-$1100, though there is a wide variation in cost, depending on features such as size, style (the freezer compartment is at the bottom vs. the top, brushed steel vs. painted, etc.), and the availability of features such ice maker, chilled water dispenser, and so forth.

Suppose that you've identified the refrigerator that you prefer and that you can afford.

*There are **two versions of the refrigerator:** A standard version and an energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$25 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $200, you are saying that you would not pay $200 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version) □Yes □ No

$25	*□Yes*	*□ No*
$50	*□Yes*	*□ No*
$75	*□Yes*	*□ No*
$100	*□Yes*	*□ No*
$150	*□Yes*	*□ No*
$200	*□Yes*	*□ No*
$250	*□Yes*	*□ No*
$375	*□Yes*	*□ No*
$500	*□Yes*	*□ No*
More than $500	*□Yes*	*□ No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient refrigerator:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B3(a). CAC question 1

Now we want to ask you about your likely decision in the event you needed to buy a new central air conditioning unit because your current one breaks down and can't be repaired.

Including the cost of installation, central air conditioning units typically cost in the neighborhood of $3000-$4000, though there is a wide variation in cost, depending on the size of the unit, the warrantee, and any difficulty arising in the installation of the unit.

Suppose that you've identified the model that suits your needs and that you can afford.

*There are **two versions of the model you've chosen:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$25 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $100, you are saying that you would not pay $100 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version)	*□Yes*	*□ No*
$25	*□Yes*	*□ No*
$50	*□Yes*	*□ No*
$75	*□Yes*	*□ No*
$100	*□Yes*	*□ No*
$125	*□Yes*	*□ No*
$150	*□Yes*	*□ No*
$200	*□Yes*	*□ No*
$250	*□Yes*	*□ No*
$300	*□Yes*	*□ No*
More than $300	*□Yes*	*□ No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient central air conditioning unit:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B3(b). CAC question 2

Now we want to ask you about your likely decision in the event you needed to buy a new central air conditioning unit because your current one breaks down and can't be repaired.

Including the cost of installation, central air conditioning units typically cost in the neighborhood of $3000-$4000, though there is a wide variation in cost, depending on the size of the unit, the warrantee, and any difficulty arising in the installation of the unit.

Suppose that you've identified the model that suits your needs and that you can afford.

*There are **two versions of the model you've chosen:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$50 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $100, you are saying that you would not pay $100 more for the energy efficient version.*

$0 (the energy efficient microwave is no more expensive than the standard version)	*□Yes*	*□ No*
$50	*□Yes*	*□ No*

$100	*□Yes*	*□ No*
$150	*□Yes*	*□ No*
$200	*□Yes*	*□ No*
$300	*□Yes*	*□ No*
$400	*□Yes*	*□ No*
$500	*□Yes*	*□ No*
$750	*□Yes*	*□ No*
$1000	*□Yes*	*□ No*
More than $1000	*□Yes*	*□ No*

[If this question is the second of the two questions asked, ask the following questions:]

On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient central air conditioning unit:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B4(a). Large TV question 1

Now we want to ask you about your likely decision in the event you needed to buy a new large TV because your current one malfunctions and can't be repaired.

Large TVs typically cost in the neighborhood of $300-$1000, though there is a wide variation in cost, depending on size and style, and features such sound quality, number of USB ports, and so forth.

Suppose that you've identified the large TV that you prefer and that you can afford.

*There are **two versions of the TV:** A standard version and an energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$10 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $60, you are saying that you would not pay $60 more for the energy efficient version.*

$0 (the energy efficient TV is no more expensive than the standard version) □Yes □ No

$10	*□Yes*	*□ No*
$20	*□Yes*	*□ No*
$30	*□Yes*	*□ No*
$40	*□Yes*	*□ No*
$50	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
$80	*□Yes*	*□ No*
$100	*□Yes*	*□ No*

$120 □*Yes* □ *No*
More than $120 □*Yes* □ *No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient TV:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

B4(b). Large TV question 2

Now we want to ask you about your likely decision in the event you needed to buy a new large TV because your current one malfunctions and can't be repaired.

Large TVs typically cost in the neighborhood of $300-$1000, though there is a wide variation in cost, depending on size and style, and features such sound quality, number of USB ports, and so forth.

Suppose that you've identified the large TV that you prefer and that you can afford.

*There are **two versions of the TV:** A standard version and an energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version. It's just more energy efficient.*

*The energy efficient version would save you **$15 per year** in electricity costs compared to a standard version, **but is more expensive to buy**.*

*Would you be willing to pay the following **additional** amount for the energy efficient version? Please indicate "Yes" or "No" for each amount. For instance, if you say "no" for $60, you are saying that you would not pay $60 more for the energy efficient version.*

$0 (the energy efficient TV is no more expensive than the standard version) □*Yes* □ *No*
$15 □*Yes* □ *No*
$30 □*Yes* □ *No*
$45 □*Yes* □ *No*
$60 □*Yes* □ *No*
$90 □*Yes* □ *No*
$120 □*Yes* □ *No*
$150 □*Yes* □ *No*
$225 □*Yes* □ *No*
$300 □*Yes* □ *No*
More than $300 □*Yes* □ *No*

[If this question is the second of the two questions asked, ask the following questions:]
On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of the following factors in your response concerning the decision to purchase an energy efficient TV:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.

I just don't think the energy efficient version would be as good as the standard version.
It makes me feel good to buy energy efficient devices.
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change.

Appendix G. Residential Payback Acceptance Survey, Landlord Intro Script

VI. Introduction to the Study [use this script if the contact list names an individual]

Hello. My name is _____ and I am calling on behalf of KCP&L, a local electric utility. KCP&L is trying to determine how to improve its energy efficiency programs and it believes that customer feedback is an important part of making these improvements. We had previously received valuable information from (Name of business indicated in the KEMA list), and we were hoping that you or another individual at your company could help us out again by answering a few questions. It would take 5-10 minutes. It is important that I talk to the decision-maker in charge of furnishing the rental units. Is he/she available?

Yes ➔ respondent is not the person who answered the telephone. Go to section II when the respondent is on the phone

Yes ➔ respondent is the person who answered the telephone. Go to section III.

No. ➔ Do I have the correct number to reach him/her?

Yes ➔ Can you tell me when would be a good time to reach him/her?

Yes ➔ OK, thanks, I'll try back then. (record the contact time)

No, but OK to call back ➔ OK, I'll try another time.

No, please don't call back ➔OK, thanks for your time.

No ➔ Can you tell me where I can reach him/her? (record number if available).

VII. Introduction to the Study [use this script if the contact list names an organization]

Hello. My name is _____ and I am calling on behalf of KCP&L, a local electric utility. We are conducting a study to understand how KCP&L customers make decisions concerning the purchase of electric appliances so we can design programs to help customers save on their energy bills. We had previously received valuable information from (Name of the organization), and we were hoping that you could help us out again by answering a few questions. Are you the decision-maker in charge of furnishing the rental units?

Yes ➔ The survey will take 5-10 minutes. Individual responses are strictly confidential; we will provide the data to the utility in a way that does not tie your responses to you. We think you will find the questions interesting. Do you have the time now to help us out?

Yes → Go to section IV.

No → May I try back another time?

Yes ➔ Obtain alternative time.

No ➔ Thank and terminate.

No → Is he/she available?

Yes → Repeat section II when decision-maker is on the phone.

No. ➔ Do I have the correct number to reach him/her?

Yes ➔ Can you tell me when would be a good time to reach him/her?

Yes ➔ OK, thanks, I'll try back then. (record the contact time)

No, but OK to call back ➔ OK, I'll try another time.

No, please don't call back ➔OK, thanks for your time.

No ➔ Can you tell me where I can reach him/her? (record number if available).

VIII. Initial script

KCP&L is interested in the decisions their customers make to replace electric appliances, and in particular how their customers make the decision about whether or not to purchase an energy efficient appliance. Our information indicates that you own or manage rental property in KCP&L's service territory. The information we *obtain will allow them to develop programs to help their customers –hopefully including you and your tenants –to save energy.*

The survey will take 5-10 minutes. Individual responses are strictly confidential; we will provide the data to the utility in a way that does not tie your responses to you. We think you will find the questions interesting. Do you have the time now to help us out?

Yes ➔ Thanks. (Go to section IV).
No ➔ May I try back another time?
Yes ➔ Obtain alternative time.
No ➔ Thank and terminate.

IX. Landlord identification and initial questions

One of the issues that KCP&L is most interested in is the decision that landlords and property managers make with regard to the use of energy efficient appliances in rental housing.

Do you own or manage at least one residential property that is not your place of residence, and that is currently occupied by paying tenants?

a. Yes, one property➔

Qa1. For your rental property, who pays the electric bill?
a. Landlord
b. Tenant
c. Management Company
d. Other
e. Don't Know

Qa2. What type of property is it?
a. single family home
b. duplex
c. apartment
e. other

Qa3. (If Qa2 = c or d) How many units are in the building? ______

b. Yes, more than one property➔

Qb1. How many properties do you own?

*Qb2. For the remainder of this survey, please consider your rental property **with the most units** when answering the questions. For this rental property, who pays the electric bill?*

a. Landlord
b. Tenant
c. Management Company
d. Varies by the unit
e. Other
f. Don't Know

Qb3. What type of property is it?
a. single family home
b. duplex

c. apartment
e. other

Qb4. (If Qb3= c or d) How many units are in the building? ______

c. *No → OK. That's all the questions we have then. Thanks for being willing to help us out. Terminate.*

X. *Which of the following appliances are provided in this rental property? (All answers: Y/N/DK/NR)*

a. Dishwasher
b. Refrigerator
c. Central air conditioning

XI. Cheap talk script

The next set of questions asks about your likely purchase behavior when buying a new energy efficient appliance for your rental property.

Imagine that you really are in the process of making the purchase decisions presented below, and anticipate how you would truly behave if the situation were real. Thanks for your help.

XII. WTP Question 1 . *Randomly choose from the set of questions in Appendix A based on responses to questions Va-c. The feasible set for the random draw is defined as follows:*

- *Questions A1(a,b) concerning lighting are always feasible.*
- *Questions A2(a,b) are feasible if question Va is "Yes".*
- *Questions A3(a,b) are feasible if question Vb is "Yes"*
- *Questions A4(a,b) are feasible if question Vc is "Yes"*

XIII. WTP Question 2. *Randomly choose from the set of questions in Appendix A based on responses to questions IVa-c of part II. The feasible set for the random draw excludes the question asked in the first WTP question above, and otherwise is the same as for WTP Question 1.*

XIV. Other Questions

We now want to ask you some demographic questions about your company.

1. What is your title in the organization? __________________

2. How long have you currently held this position? ___________ years

3. To the best of your knowledge, has (Name of organization) participated in any KCP&L energy efficiency programs within the last year?
   a. Yes → go to Q4 and Q5
   b. No
   c. Don't know
   d. Refused

4. (Ask if yes in Q3) Which measures did you install or actions did you take as a result of the energy efficiency program? (do not read list; mark all that apply)
   a. Attic Insulation
   b. Wall Insulation

c. Install Windows
d. Replace air conditioner (or heat pump)
e. Air conditioner tune-up
f. Install ceiling fan
g. Install programmable thermostat
h. Install CFLs in indoor public areas
i. Install high efficiency lighting in exterior areas
j. Install Refrigerator
k. Other

5. (Ask if yes in Q3) On a scale of 0 to 10, with 0 being “extremely dissatisfied” and 10 being “extremely satisfied,” how satisfied were you with this program? You may use any number from 0 to 10.
_______ (0-10, DN, NR)

X. Termination script

OK, that’s all the questions I have. Thanks a lot for your time.

Appendix H. Landlord Payback Acceptance Survey

EVERY RESPONDENT GETS UP TO TWO QUESTIONS FROM THIS APPENDIX, PER RESPONSES TO QUESTION IV. THESE QUESTIONS ARE RANDOMIZED AND THEN ASKED IN ORDER UNTIL A MAXIMUM OF TWO ARE COMPLETED.

NOTE THAT THERE ARE TWO VERSIONS OF EVERY QUESTION, WITH THE VERSIONS DIFFERING ONLY BY THE DOLLAR AMOUNTS USED IN THE QUESTION, SO ONCE THE FEASIBILE SET OF DEVICES IS DEFINED AND A DEVICE IS CHOSEN FOR A WTP QUESTION, WHICH OF THE TWO QUESTIONS IS CHOSEN IS BY RANDOM ASSIGNMENT.

A1(a). Lighting questions I

Usually tenants are responsible for replacing bulbs in a rental property, but often when tenants vacate a property landlords find that they must replace burned out bulbs that the tenant did not replace. We want to ask you about your likely decision in the event you need to buy a new light bulb for your rental property.

Please think about a particular socket in the living space of this rental property.

*Assume you have in mind a particular type of bulb and a particular wattage. You find the bulb you need, and there is a standard version and an energy efficient version. Assume there is **no difference** in the quality of lighting between the two versions. In other words, the energy efficient version looks just like the standard version of the light bulb, and has the exact same quality of light, except that it's more energy efficient.*

I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient version of the bulb if it ***reduces electricity costs by $1 per year**.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question (see below).

$0 (the energy efficient light bulb is no more expensive than the standard bulb)	*□Yes*	*□ No*
$1	*□Yes*	*□ No*
$2	*□Yes*	*□ No*
$3	*□Yes*	*□ No*
$4	*□Yes*	*□ No*
$5	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$8	*□Yes*	*□ No*
$10	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
More than $12	*□Yes*	*□ No*

If this question is the second of the two questions asked:

I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient light bulb:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;

We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

A1(B). Lighting questions 2

Usually tenants are responsible for replacing bulbs in a rental property, but often when tenants vacate a property landlords find that they must replace burned out bulbs that the tenant did not replace. We want to ask you about your likely decision in the event you need to buy a new light bulb.

Please think about a particular socket in the living space of one of this rental property

*Assume you have in mind a particular type of bulb and a particular wattage. You find the bulb you need, and there is a standard version and an energy efficient version. Assume there is **no difference** in the quality of lighting between the two versions. In other words, the energy efficient version looks just like the standard version of the light bulb, and has the exact same quality of light, except that it's more energy efficient.*

*I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient version of the bulb if it **reduces electricity costs by $3 per year**.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question (see below).

$0 (the energy efficient light bulb is no more expensive than the standard bulb) □Yes □ No

$3	*□Yes*	*□ No*
$6	*□Yes*	*□ No*
$9	*□Yes*	*□ No*
$12	*□Yes*	*□ No*
$18	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$30	*□Yes*	*□ No*
$45	*□Yes*	*□ No*
$60	*□Yes*	*□ No*
More than $60	*□Yes*	*□ No*

If this question is the second of the two questions asked:
I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient light bulb:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

Q2a. Dishwasher questions 1

Now we want to ask you about your likely decision in the event you needed to buy a new dishwasher because one at your rental property breaks down and can't be repaired.

Dishwashers typically cost in the neighborhood of $700-$800, though there is a wide variation in cost, depending on features such as size, noisiness, style, and the availability of features such as delayed-start and hard food disposer.

Suppose that you've identified the dishwasher you prefer given the cost.

*There are **two versions of the dishwasher:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version except that it's more energy efficient.*

I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient dishwasher if it ***reduces electricity costs by $6 per year***.

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-k, and then follow the following algorithm (Ipsos: hopefully this is clear enough to develop the proper programming algorithm. I can work with your team to clarify as necessary. The idea here is to minimize the number of questions necessary to complete the WTP data without making the algorithm overly complicated):

Step 1. Random draw from choices a-l below.
Step2. Ask about the amount indicated.

- ➔ *If answer is "no", fill in "no" for that value and all values higher, and do the following:*
  - ➔ *If on (a) go to the next question.*
  - ➔ *If at (b), go to (a):*
    - ➔ *if (a) is already filled in, go to the next question; otherwise return to the start of Step 2.*
  - ➔ *If above (b), reduce value by two increments and:*
    - ➔ *if the choice is already filled in, increase the value by one increment:*
      - ➔ *if the choice is filled in, go to the next question; otherwise return to the start of Step 2.*
    - ➔ *if the choice is not filled in, return to the start of Step 2.*

- ➔ *If answer is "yes", fill in "yes" for that value and all values lower, and do the following:*
  - ➔ *If at (k), go to the next question*
  - ➔ *If at (j), go to (k) :*
    - ➔ *if (k) is already filled in, go to the next question; otherwise return to the start of Step 2.*
  - ➔ *If below (j), increase value by two increments and :*
    - ➔ *if the choice is already filled in, reduce the value by one increment:*
      - ➔ *if the choice is filled in, go to the next question; otherwise return to the start of Step 2.*
    - ➔ *if the choice is not filled in, return to the start of Step 2.*

a) $0 (the energy efficient dishwasher is no more expensive than the standard version) □Yes □ No

b)	*$6*	*□Yes*	*□ No*
c)	*$12*	*□Yes*	*□ No*
d)	*$18*	*□Yes*	*□ No*
e)	*$24*	*□Yes*	*□ No*
f)	*$36*	*□Yes*	*□ No*
g)	*$48*	*□Yes*	*□ No*

h) $60 □Yes □ No
i) $90 □Yes □ No
j) $120 □Yes □ No
k) More than $120 □Yes □ No

[If this question is the second of the two WTP questions, ask the following questions:]

I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient dishwasher:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

Q2b. Dishwasher questions 2

Now we want to ask you about your likely decision in the event you needed to buy a new dishwasher because one at your rental property breaks down and can't be repaired.

Dishwashers typically cost in the neighborhood of $700-$800, though there is a wide variation in cost, depending on features such as size, noisiness, style, and the availability of features such as delayed-start and hard food disposer.

Suppose that you've identified the dishwasher you prefer given the cost.

*There are **two versions of the dishwasher:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version, except it's more energy efficient.*

*I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient dishwasher if it **reduces electricity costs by $12 per year**.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question.

$0. (the energy efficient dishwasher is no more expensive than the standard version) □Yes □ No
$12 □Yes □ No
$24 □Yes □ No
$36 □Yes □ No
$48 □Yes □ No
$72 □Yes □ No
$96 □Yes □ No
$120 □Yes □ No
$180 □Yes □ No
$240 □Yes □ No
More than $240 □Yes □ No

[If this question is the second of the two WTP questions, ask the following questions:]

I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient dishwasher:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

Q3a. Refrigerator question 1

Now we want to ask you about your likely decision in the event you needed to buy a new refrigerator because one at your rental property breaks down and can't be repaired.

Refrigerators typically cost in the neighborhood of $900-$1100, though there is a wide variation in cost, depending on features such as size, style, and the availability of features such ice maker, chilled water dispenser, and so forth.

Suppose that you've identified the refrigerator you prefer given the cost.

*There are **two versions of the refrigerator:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version, except that it's more energy efficient.*

*I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient refrigerator if it **reduces electricity costs by $12 per year**.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question.

$0 (the energy efficient refrigerator is no more expensive than the standard version) □Yes □ No

$12	*□Yes*	*□ No*
$24	*□Yes*	*□ No*
$36	*□Yes*	*□ No*
$48	*□Yes*	*□ No*
$72	*□Yes*	*□ No*
$96	*□Yes*	*□ No*
$120	*□Yes*	*□ No*
$180	*□Yes*	*□ No*
$240	*□Yes*	*□ No*
More than $240	*□Yes*	*□ No*

[If this question is the second of the two WTP questions, ask the following questions:]

I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient refrigerator:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;

We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

Q3b. Refrigerator question 2

Now we want to ask you about your likely decision in the event you needed to buy a new refrigerator because one at your rental property breaks down and can't be repaired.

Refrigerators typically cost in the neighborhood of $900-$1100, though there is a wide variation in cost, depending on features such as size, style, and the availability of features such ice maker, chilled water dispenser, and so forth.

Suppose that you've identified the refrigerator you prefer given the cost.

*There are **two versions of the refrigerator:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version, except that it's more energy efficient.*

*I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient refrigerator if it **reduces electricity costs by $25 per year**.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question.

$0 (the energy efficient refrigerator is no more expensive than the standard version) □Yes □ No

$25	*□Yes*	*□ No*
$50	*□Yes*	*□ No*
$75	*□Yes*	*□ No*
$100	*□Yes*	*□ No*
$150	*□Yes*	*□ No*
$200	*□Yes*	*□ No*
$250	*□Yes*	*□ No*
$375	*□Yes*	*□ No*
$500	*□Yes*	*□ No*
More than $500	*□Yes*	*□ No*

[If this question is the second of the two WTP questions, ask the following questions:]
I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient refrigerator:
It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

Q4a. CAC questions 1

Now we want to ask you about your likely decision in the event you needed to buy a new central air conditioning unit because one at your rental property breaks down and can't be repaired.

Including the cost of installation, central air conditioning units typically cost in the neighborhood of $3000-$4000, though there is a wide variation in cost, depending on the size of the unit, the warrantee, and any difficulty arising in the installation of the unit.

Suppose that you've identified the unit you prefer given the cost.

*There are **two versions of the model:** A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version, except that it's more energy efficient.*

*I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient refrigerator if it **reduces electricity costs by $25 per year**.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question.

$0 (the energy efficient central air conditioning unit is no more expensive than the standard version) □Yes□ No

$25	*□Yes*	*□ No*
$50	*□Yes*	*□ No*
$75	*□Yes*	*□ No*
$100	*□Yes*	*□ No*
$150	*□Yes*	*□ No*
$200	*□Yes*	*□ No*
$250	*□Yes*	*□ No*
$375	*□Yes*	*□ No*
$500	*□Yes*	*□ No*
More than $500	*□Yes*	*□ No*

[If this question is the second of the two WTP questions, ask the following questions:]
I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient central air conditioning unit:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

Q4b. CAC questions 2

Now we want to ask you about your likely decision in the event you needed to buy a new central air conditioning unit because one at your rental property breaks down and can't be repaired.

Including the cost of installation, central air conditioning units typically cost in the neighborhood of $3000-$4000, though there is a wide variation in cost, depending on the size of the unit, the warrantee, and any difficulty arising in the installation of the unit.

Suppose that you've identified the unit you prefer given the cost.

There are ***two versions of the model:*** *A standard version and a more energy efficient version. Assume there is no other difference in the two versions. In other words, the energy efficient version is just like the standard version, except that it's more energy efficient.*

I'm now going to ask you how much more –if anything more –you would be willing to pay for the energy efficient refrigerator if it ***reduces electricity costs by $50 per year****.*

The amounts below are the categories that match the residential internet survey. We want to randomly start at a-l, and then follow the algorithm indicated in the first dishwasher question.

$0 (the energy efficient central air conditioning unit is no more expensive than the standard version) □Yes□ No

$50	*□Yes*	*□ No*
$100	*□Yes*	*□ No*
$150	*□Yes*	*□ No*
$200	*□Yes*	*□ No*
$300	*□Yes*	*□ No*
$400	*□Yes*	*□ No*
$500	*□Yes*	*□ No*
$750	*□Yes*	*□ No*
$1000	*□Yes*	*□ No*
More than $1000	*□Yes*	*□ No*

[If this question is the second of the two WTP questions, ask the following questions:]
I'm now going to read to you a set of 7 statements. On a scale of 1-5, where 1 is "strongly disagree" and 5 is "strongly agree", please indicate the importance of each statement in your response concerning the decision to purchase an energy efficient central air conditioning unit:

It doesn't make financial sense for me to pay more than I indicated for the energy efficient version.
I don't think the energy efficient version will last long enough to justify paying more for it than I indicated.
I just don't think the energy efficient version would be as good as the standard version;
It makes me feel good to buy energy efficient devices;
We're all influenced somewhat by our friends and family, and my social group tends to look favorably on energy efficient purchases.
I think it's a good thing to use energy efficient products to reduce global climate change;

NAVIGANT

Appendix I. Commercial and Industrial Payback Acceptance Survey

Intro_1
Hello. My name is _____ and I am calling on behalf of your electric utility, KCP&L. KCP&L is trying to determine how to improve its energy efficiency programs, and it believes that customer feedback is an important part of making these improvements. It would be a big help if we could get feedback from your organization. It's important that I talk to the facilities manager, energy manager, or another person who is ***most familiar*** *with the management of your company's lighting, heating, and cooling technology.*

Are you that person?

1. Yes **(go to Intro_2)**
2. No - *Could you please give me the name and phone number of the person I should speak to, or someone who would know the proper person to speak to?*
NAME: ___________________________________ PHONE: ____

8. Don't know
9. Refused - *Thank you very much for your time. Goodbye.*

Intro_2
Great! I'd like to ask you a few questions. This will take about 5-10 minutes and will greatly help KCP&L tailor its energy efficiency programs to better serve its customers. Your responses will be completely confidential; your name and organization will be separated from the responses before results are communicated to KCP&L. Can we start?

1. Yes (go to Background)
2. No (*When is a good time to callback?*) ____)
9. Refused - Thank *you very much for your time. Goodbye.*

INT NOTE: If the 'NO" feels like a refusal - state the following: *"KCP&L is trying to determine how to improve its energy efficiency programs, and it believes that customer feedback is an important part of making these improvements. It would be a big help if we could get feedback from your organization. May we continue?"*

I. Background

Great – thank you so much. First, I have a few background questions about your position and your facility.

Q1. What is your title in the organization?

8. Don't know
9. Refused

Q2. How many years have you been in your current position in the organization? ___ Years

Q3. How many buildings do you manage? _____ buildings

(If Q3 greater than 1) For the remainder of this survey, please consider the **largest** building that you manage when answering the questions.

Q4. What is the <u>primary use</u> of this building that you manage? Would you say…? (Select One)

a. Office space
b. School/Educational
c. Church/Place of worship
d. Health care
e. Retail
f. Warehouse
g. Industrial
h. Other ____
8. Don't know
9. Refused

Q5. Does your organization own, or lease this building?

a. Own
b. Lease
c. Other
8. Don't know
9. Refused

Q6. (Ask for respondents in the client-supplied contact list) Has your organization participated in any KCP&L energy efficiency programs in the last year?

a. Yes → Continue to Q7, Q8
b. No
c. Don't know
d. Refused

Q7. (If yes to Q6) Did you participate in the following programs? (Y/N/DN/R for all programs)

a. On-site or online energy audit
b. Building operator certification
c. Rebates for lighting, HVAC, or motors
d. Rebates for equipment besides lighting, HVAC, or motors
e. New Construction
f. Small Business direct install of lighting, HVAC, or refrigeration
g. Retro commissioning
h. Continuous Energy Improvement

Q8. (If yes to Q6) On a scale of 0 to 10, with 0 being "extremely dissatisfied" and 10 being "extremely satisfied," how satisfied were you with these programs in general? You may use any number from 0 to 10.

_______ (0-10, DN, NR)

II. Questions about the decision to install

We want to ask you about decisions you make concerning the purchase of energy efficient technologies in lighting, heating, and cooling. We're asking this because KCP&L wants to get a better idea of the typical behavior of its customers with respect to purchases so that it can better design its future offerings of energy efficient programs. The next question concerns what energy experts call "payback time". This is the time it takes for the total accumulated energy savings of an energy efficiency technology to equal the original cost of the technology. For instance, if the technology costs $100, and saves $10 per year, then the payback time is 10 years, because it takes 10 years for savings of $10 per year to equal the $100 initial cost of the technology.

Q5. Have you heard the term "payback time" or "payback period" before, or are you familiar with the concept?

No ➔ *OK. So it gets at the idea that if a new energy-saving technology, like a new kind of boiler for heating water, costs more than the standard technology, it takes a certain amount of time for the energy savings to "pay off" the extra cost of the new technology. Does this make sense?*

Yes ➔ *Good. So now to our first question* [drop down to below, "Consider the purchase…."]

No ➔ [Try to probe and explain. If respondent does not seem to understand after a brief interaction, terminate].

Yes➔ *Good. So now to our first question:*
Consider the purchase of a technology that affects the energy efficiency of lighting, heating, or cooling for your business. Suppose the technology has NO impact on the QUALITY of lighting, heating, and cooling, it just changes the amount of energy consumed. An example might be a variable frequency drive in an HVAC system, or replacing a lighting system with a lighting system that is exactly the same in all ways except its energy use.

Q6. Does your business have either an established rule, or a general rule-of-thumb, requiring that an energy-efficient technology meet a threshold for the payback time? In other words, must the technology pay itself off in energy savings in no more than a certain number years?

Yes ➔ **Q6a. What is the TYPICAL required payback time? ___Yrs [go to Q7].**
No ➔ **Q6b. Based on your experience, would your firm generally purchase an energy efficient technology if the payback time were… [after getting answers, go to terminal script].**

We want to randomly start at a-k, and then follow the following algorithm.

Step 1. Random draw from choices a-l below.

Step2. Ask about the amount indicated.

➔ *If answer is "no", fill in "no" for that value and all values higher, and do the following:*

➔ *If on (a) go to the next question.*

➔ *If at (b), go to (a):*

➔*if (a) is already filled in, go to the next question; otherwise return to the start of Step 2.*

➔ *If above (b), reduce value by two increments and:*

➔ *if the choice is already filled in, increase the value by one increment:*

➔ *if the choice is filled in, go to the next question; otherwise return to the start of Step 2.*

➔ *if the choice is not filled in, return to the start of Step 2.*

➔ *If answer is "yes", fill in "yes" for that value and all values lower, and do the following:*

➔*If at (l), go to the next question*

➔*If at (k), go to (l) :*

➔ *if (l) is already filled in, go to the next question; otherwise return to the start of Step 2.*

➔ *If below (k), increase value by two increments and :*

➔ *if the choice is already filled in, reduce the value by one increment:*

➔ *if the choice is filled in, go to the next question; otherwise return to the start of Step 2.*

➔ *if the choice is not filled in, return to the start of Step 2.*

(The verbiage in parentheses is to be used if the respondent is unclear what the question is asking. Use this explanation for one or two of the responses as the question sequence is worked through, then use it only if it seems necessary to help the respondent)

a) *Less than a year (that is, it would take less than 1 year for the energy savings to exceed the cost of the technology).* □*Yes* □ *No* □ *Don't know/not sure*
b) *1 year (that is, it would take about 1 year for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
c) *2 years (that is, it would take about 2 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
d) *3 years(that is, it would take about 3 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
e) *4 years (that is, it would take about 4 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
f) *5 years (that is, it would take about 5 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
g) *6 years (that is, it would take about 6 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
h) *8 years (that is, it would take about 8 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
i) *10 years (that is, it would take about 10 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
j) *12 years(that is, it would take about 12 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*
k) *More than 12 years (that is, it would take more than 12 years for the energy savings to exceed the cost of the technology)* □*Yes* □ *No* □ *Don't know/not sure*

OK, that's all we have. Thanks for your time!

Appendix J. 2012 Residential On-Site Survey Form

Site ID #

2012 Residential
On-Site Survey Form
For

KCPL
05/22/2012

Customer Information: (Please Print)

Customer			
Phone	( )		
Street Address:			
City:		Zip	
Mailing			
City:		Zip	
County:			

Survey Tracking Information:

	Date:	Performed by, Initials
Field Survey Performed:	__ / __ / __	__ __ __
Completeness and Quality Check	__ / __ / __	__ __ __
Data Entry Complete:	__ / __ / __	__ __ __

NAVIGANT

HOME CHARACTERISTICS - BY INTERVIEW

INTRODUCTION TO SURVEY

Thank you again for participating in the survey. To start, I'm going to ask you a few questions about your home and your home's equipment. After this brief interview, I will walk through your home and so that I can inventory your energy using equipment to record all the specific information about the equipment. I will be recording information on the following items: lighting, heating and cooling systems, water heating system, cooking equipment, home electronics, laundry equipment, refrigerators and freezers, fans and miscellaneous equipment. I will have some questions for you about the equipment and how you use it, so it's best if we walk through the survey together.

1. Which of the following best describes the home/residence (based on **surveyor** judgment):
   - ☐ Single-family construction
   - ☐ Single-family factory manufactured/modular
   - ☐ Single-family mobile home
   - ☐ Two family residence (duplex)—traditional structure
   - ☐ Apartment (3 + families) --- traditional structure
   - ☐ Condominium---traditional structure
   - ☐ Row House or any "Other": (describe________________________________)

2. Do the occupants own or rent the residence?
   - ☐ Own
   - ☐☐ Rent

3. What year was this residence built?
   ________ Year Built Interviewer Estimate? ☐
   If estimate, OK to estimate by decade up to 2000, then estimate to year.

4. How many square feet is the above-grade conditioned living space? ____________

5. How many square feet of conditioned living space is below-grade? ___________

6. Total square footage of home (Add 4 & 5) _________________________

7. Is this the main, weekend, or seasonal/vacation residence? (CHECK ONLY ONE)
   - ☐ Main Residence
   - ☐ Weekend Residence
   - ☐ Seasonal/Vacation Residence

8. In each season, how many people live in this household?
   _______ Summer
   _______ Winter

9. How many stories tall is the home? (check one, based on **surveyor** judgment)
   - ☐ One Story
   - ☐ Split Foyer
   - ☐ Split Level
   - ☐ Two Stories

- ☐ Three or More Stories

For the remainder of the survey,
answer questions based on
YOUR OBSERVATION, whenever possible.
Otherwise, ask the homeowner.

HOME CHARACTERISTICS – BY OBSERVATION

10. Estimate square feet of conditioned floor space: (other than garage, basement, and porch)

______________sq.ft.

11. Are any of the following areas used as conditioned living space? (ENTER ALL THAT APPLY)
____________ Garage (sq. ft).

____________ Basement (sq. ft).

____________ Porch (sq. ft).

12. Does this residence have an accessible attic?
    - ☐ Yes/Vented
    - ☐ Yes/Unvented
    - ☐ No

13. Does this residence have an accessible crawl space?
    - ☐ Yes Access/Vents Open
    - ☐ Yes Access/Vents Closed
    - ☐ No

NAVIGANT

LIGHTING

14. Fill out the following information about the indoor and outdoor lighting of the home using the following codes.

Fixture Number	Number of identical fixtures	Room Type	Socket Type	Bulb Type (existing)	No. of bulbs per fixture	Watts per Bulb	Watts per Fixture	Hours of use Code	(1) standard, (2) dimmable, (3) 3-way	Hardwire? [Yes=1 No=2]	(1) Exposed flood (2) recessed can (99) other	(1) Control (2) Manual, (3) Timer, (4)Photocell, (5)occupancy sensor
1												
2												
3												
4												
5												
6												
7												
8												
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26												
27												
28												
29												
30												

Lighting Room Codes		Socket Type Codes	Bulb Type Codes		Hours of Use Code	
1. Living Room	8. Office	1. Edison Base	1. Incandescent	8. LED	1. Infrequent Use - < 1hr	5. Security Lighting
2. Kitchen	9. Closet	2. Candelabra	2. T12 Fluorescent	9. No Bulb	2. Low Use - 1 to 2 hrs	6. Dusk-to-Dawn
3. Dining Room	10. Utility Room	3. Pin Base	3. T8 Fluorescent	88. Don't Know	3. Med. Use - 2-5hrs	7. Not Applicable
4. Hall/Foyer	11. Basement	4. Nightlight	4. High Performance T8	99. Other	4. High Use - > 5hrs	99. Other
5. Bedroom	12. Exterior	88. Don't know	5. CFL			
6. Bathroom	88. Don't know	99. Other	6. Halogen			
7. Garage	99. Other		7. Xenon			

SPACE HEATING

15. Is the heating system accessible?
- ☐ Yes (note (1) ton = 12,000 btu’s)
- ☐ No

16. When was the heating system last serviced or repaired by a qualified HVAC technician?
- ☐ less than 6 months
- ☐ 6 - 12 months
- ☐ 1 to 2 years
- ☐ more than 2 years
- ☐ Never
- ☐ Not Sure

17. If there is a secondary or backup heating system, how often is it used during winter?
- ☐ Don't have one
- ☐ Never or Rarely
- ☐ Often
- ☐ Always

(*IF RESIDENCE TYPE: multifamily (4or more attached units*) ASK THE NEXT QUESTION:

18. Does the heating system serve more than one residence?
- ☐ Yes
- ☐ No
- ☐ Not Sure

SPACE HEATING

19. Fill out the following information about the heating system of the home using the following codes:
(Note: Record the make and model number on the supplemental data sheet.)

(*a*) Type of System
(1) Central furnace
(2) Central heat pump - air
(3) Central heat pump - water
(4) Central heat pump - ground
(5) Built-in electric room units with indiv. rm. controls (incl. baseboards)
(6) Boiler/Steam/Hot Water
(7) Dual fuel heat pump (electric & gas)
(8) Wall or floor furnace
(9) Portable electric heater
(10) Portable kerosene heater
(11) Wood burning stove
(12) Coal burning stove
(13) Fireplace
(14) Solar
(15) None
(16) Electric Thermal Storage
(17) Other ______________________________

(*b*) Fuel Type
(1) Electricity
(2) Natural Gas
(3) Propane or Bottled Gas
(4) Fuel Oil
(5) Wood
(6) Kerosene
(7) Coal
(8) Solar
(9) Biomass Pellets
(10) Other

(*d*) Air Handler Location
(1) Conditioned space
(2) Unconditioned space
(3) Unconditioned attic
(4) Outdoors
(5) No air handler
(6) Not sure

(*e*) Location of Majority of Duct Work
(1) Conditioned space
(2) Unconditioned space
(3) Unconditioned attic
(4) Outdoors
(5) No ducts

	Primary System	**Second System**	**Third System**
1. Type of system (*a*)			
2. Fuel type (*b*)			
3. Input capacity *kW*			
3a. Input capacity *kBtuh*			
4. Output capacity (*Btuh/hr*)			
5. Make			
6. Model			
7. Year of Manufacture			
8. Fan HP			
9. Fan Watts (if HP unavailable)			
10. Fan Speed (Constant, Variable)			
11. Is fan ECM?			
12. Energy Star? *(yes = 1,no = 2)*			
13. Air handler location (*d*)			
14. Duct work location(*e*)			
15. Duct work insulated *(yes = 1,no = 2)*			
16. Programmable thermostat *(yes = 1, no = 2)*			
17.Energy Recovery (yes. no)			

SPACE COOLING

20. Is the cooling system accessible?
    - ☐ Yes (note (1) ton = 12,000 btu's)
    - ☐ No

21. When was the cooling system last serviced or repaired by an HVAC technician?
    - ☐ less than 6 months
    - ☐ 6 - 12 months
    - ☐ 1 to 2 years
    - ☐ More than 2 years
    - ☐ Never
    - ☐ Not Sure

22. If there is a secondary or backup cooling system, how often is it used during summer?
    - ☐ Don't have one
    - ☐ Never or Rarely
    - ☐ Often
    - ☐ Always

(*IF RESIDENCE TYPE: multifamily (4or more attached units*) ASK THE NEXT QUESTION

23. Does the air conditioning system serve more than one residence?
    - ☐ Yes
    - ☐ No
    - ☐ Not Sure

SPACE COOLING

24. Fill out the following information about the central air conditioning system using the following codes:
(Note: Record the make and model number on the supplemental data sheet.)

(*a*) Type of System
(1) Central electric, straight cool/packaged
(2) Central electric, straight cool/split
(3) Central heat pump/air-packaged
(4) Central heat pump/air-split
(5) Central heat pump/water or ground source
(6) Central Gas
(7) Room air conditioning only
(8) Room air conditioning with heat pump
(9) Room air conditioning with strip heat
(10) Whole house AC with window/wall mounted
(11) None
(12) Other: ___________________________

(*c*) Air Handler Location
(1) Conditioned space
(2) Unconditioned space
(3) Unconditioned attic
(4) Outdoors
(5) No air handler
(6) Not sure

(*d*) Location of Majority of Duct Work
(1) Conditioned space
(2) Unconditioned space
(3) Unconditioned attic
(4) Outdoors
(5) No ducts

	Primary System	Second System	Third System
1. Type of system (*a*)			
2. Output Capacity (kBtu/hr)			
3. Output Capacity (tons)			
4. Make			
5. Model			
6. Year of Manufacture			
7. Fan HP			
8. Fan Speed (Variable, Constant)			
9. Is Fan ECM?			
10. SEER			
11. EER			
12. Energy Star? *(yes=1,no=2)*			
13. Air handler location (*c*)			
14. Duct work location (*d*)			
15. If in conditioned space, are ducts in need of repair?			
16. Duct work insulated *(yes=1,no=2)*			
17. Programmable thermostat *(yes=1, no=2)*			

Water Heating

25. Is the water heating system accessible?
    - ☐ Yes
    - ☐ No

26. Where are the hot water lines located?
    - ☐ In Slab
    - ☐ Un-Conditioned Area (Crawl space, attic, basement)
    - ☐ Conditioned Area (including finished basement and/or attic)
    - ☐ Other _______________

(*IF RESIDENCE TYPE: multifamily (4or more attached units*) ASK THE NEXT QUESTION:

27. Is there a separate water heater serving only this residence?
    - ☐ Yes
    - ☐ No
    - ☐ Not Sure

28. Fill out the following information about the water heating system using the following codes:

(Note: Record the make and model number on the supplemental data sheet.)

(*a*) System Type
(1) Electric Resistance
(2) Heat Pump
(3) Natural Gas
(4) Propane or Bottled gas
(5) Fuel oil
(6) Instantaneous Electric
(7) Instantaneous Gas
(8) Solar
(9) Fossil Fuel , Unknown

	Unit 1	**Unit 2**
1. Primary fuel type (*a*)		
2. Back-up fuel type (*a*)		
3. Input Rating (kW)		
3a. Input Rating (kBtu/hr)		
4. Capacity in gallons		
5. Tank Insulation R-Value (if labeled)		
8. Location *(cond = 1, uncond = 2)*		
9. Tank Wrap (*yes = 1, no = 2*)		
10. Timer (*yes = 1, no = 2*)		
11. Add-on heat pump (*yes = 1, no = 2*)		
12. Pipe wrap near the water heater (*yes = 1, no = 2*)		
13. Heat Recovery from Heat Pump?		
14. Drain Water Heat Recovery?		
15. Tank temperature setting*(Lo, Med, Hi)*		

BRAND NAME MODEL NUMBER ENERGY STAR

Primary Heater ____________ ____________ ☐
Second Heater ____________ ____________ ☐

WATER HEATING

29. Are there **low-flow showerheads (< 2.5 gpm)** installed in the showers? (Low flow takes 24 seconds or more to fill a gallon jug.)

    Number with __________ Number without __________

30. Are there **faucet aerators** installed on the faucets? (Usually < 2 gpm) (Low flow takes 30 seconds or more to fill a gallon jug or 15+ seconds to fill ½ gallon.)

    Number with __________ Number without __________

Refrigerators

31. Fill out the following information about the refrigerators of the home using the following codes:

(*a*) Type
(1) Side by side
(2) Top mount freezer
(3) Bottom mount freezer
(4) Single door with freezer
(5) Single door w/o freezer
(6) Compact (<5 cubic feet)

	Unit 1	Unit 2	Unit 3
1. Type (*a*)			
2. Size (cubic feet)			
3. Year of manufacture			
4. Make			
5. Model			
6. Ice Maker? (*yes* = 1, *no* = 2)			
7. Energy Star Logo (*yes* = 1, *no* = 2)			
8. Unit Plugged In? (*yes* = 1, *no* = 2)			
9. Location *(cond=1, uncond=2)*			

Freezers

32. Fill out the following information about the freezers of the home using the following codes:

(*a*) Type	(*b*) Seal Condition	(*c*) Coil Condition
(1) Chest	(1) Complete	(1) Clean
(2) Upright FF	(2) Cracked	(2) Dirty
(3) Upright Manual	(3) Missing Sections	(3) Inaccessible
(4) None		

	Unit 1	Unit 2	Unit 3
1. Type (*a*)			
2. Size (cubic feet)			
3. Make			
4. Model			
5. Year of manufacture			
6. Energy Star (*yes* = *1*, *no* = *2*)			
7. Location *(cond=1, uncond=2)*			

Cooking

33. Is there a range/cooktop in the residence?
☐ Yes
☐ No (SKIP TO OVEN)

34. What type of range/cooktop do you primarily use in this home?(CHECK ONLY ONE)
☐ Electric Range/Cooktop
☐ Gas Range/Cooktop [SKIP TO OVEN]
☐ Propane Range/Cooktop [SKIP TO OVEN]
☐ Other (*Describe:*___________________________) [SKIP TO OVEN]
☐ None [SKIP TO OVEN]

35. Is the electric range/cooktop Energy Star?
☐ Yes
☐ No

36. Is the electric range/cooktop induction?
☐ Yes
☐ No

37. How old is the electric range/cooktop?
_______ (Age in years) ☐☐Estimate?☐
(If estimate, estimate to increments of 5 years or less)

38. Is there an oven in the residence?
☐ Yes
☐ No (SKIP TO DISHWASHER)

39. What type of oven do you primarily use in this residence? (CHECK ONLY ONE)
- ☐ Electric Oven
- ☐ Gas Oven [SKIP TO DISHWASHER]
- ☐ Propane Oven [SKIP TO DISHWASHER]
- ☐ Other (*Describe:*_________________ __________) [SKIP TO DISHWASHER]
- ☐ None [SKIP TO DISHWASHER]

40. Is the electric oven:
- ☐ standard
- ☐ convection
- ☐ combination

41. How old is the electric oven?

_______ (Age in years) ☐ Estimate?

(If estimate, estimate to increments of 5 years or less)

Dishwashers

42. Is there a dishwasher in this residence?
- ☐ Yes
- ☐ No

43. How many dish loads are washed per week?

__________loads per week

44. How often is the energy saver option used during the drying cycle?
- ☐ All the time
- ☐ Sometimes
- ☐ Never

45. Is the dishwasher Energy Star?
- ☐ Yes
- ☐ No
- ☐ Don't Know

46. How old is the dishwasher?

_______ (Age in years) ☐ Estimate?

(If estimate, estimate to increments of 5 years or less)

47. If there is a dishwasher, does it have a heat booster?
- ☐ Yes
- ☐ No
- ☐ None

	BRAND NAME	MODEL NUMBER
DISHWASHER	______________________	______________________

Laundry

48. Is there a clothes washer in this residence for private use?
    - ☐ Yes
    - ☐ No

49. Is the clothes washer Energy Star?
    - ☐ Yes
    - ☐ No

50. How old is the clothes washer?
    _______ (Age in years) ☐☐Estimate?☐
    (If estimate, estimate to increments of 5 years or less)

51. How many loads of laundry are washed per week? _______

52. If there is a clothes washer, what is the orientation?
    - ☐ Horizontal (front loading)
    - ☐ Vertical (top loading)
    - ☐ None

Laundry

53. Is there a **clothes dryer** in this residence?
    - ☐ Yes
    - ☐ No

54. If there is a clothes dryer, what type of fuel does it use *for heat*?
    - ☐ Electric
    - ☐ Natural Gas [SKIP TO HOME ELECTRONICS]
    - ☐ LP Gas [SKIP TO HOME ELECTRONICS]
    - ☐ Other (*Describe:*_____________________) [SKIP TO HOME ELECTRONICS]
    - ☐ None

55. Is the clothes dryer Energy Star?
    - ☐ Yes
    - ☐ No

56. How many loads of laundry are dried with the clothes dryer per week?
    ____

57. How old is the clothes dryer?
    _______ (Age in years) ☐☐Estimate?☐
    (If estimate, estimate to increments of 5 years or less)

	BRAND NAME	MODEL NUMBER
CLOTHES WASHER	_____________________	____________________
CLOTHES DRYER	_____________________	____________________

Home Electronics & Other

TELEVISIONS

	Display (CRT/LCD/Plasma/Other)	Format Std/Wide	Size (Diag. inches)	Energy Star? (Y/N)	EMS	Avg. Hours of Daily Use
Unit 1						
Unit 2						
Unit 3						
Unit 4						
Unit 5						
Unit 6						

Video Game Systems and DVRs

	Type (DVR OR Video Game System)	EMS	Avg. Hours of Daily Use
Unit 1			
Unit 2			
Unit 3			
Unit 4			
Unit 5			
Unit 6			

Energy Management System	
EMS Type	**EMS Code**
Manual Power Strip (user turns off PS after each use)	**MPS**
Always On Power Strip	**AOPS**
Timer Strip	**TM**
Occupancy Sensor	**OSS**
Smart Strip	**SMS**
Other	**OT**

Computers & Peripherals

Computers	Type (Desktop OR Laptop)	Screen Size (diag. inch)	IF Desktop, Display: CRT OR LCD	Additional Display: CRT OR LCD	Energy Star? (Y/N)	EMS	Auto power down enabled? (Y/N)	Avg. Hours On per Day
Unit 1								
Unit 2								
Unit 3								
Unit 4								
Unit 5								
Unit 6								

Computer Peripherals	Type (Printer, scanner, external hard drive, modem, router)	Energy Star? (Y/N)	Energy Management System- (MPS, AOPS, TM, OSS, SMS, OT)	Average Hours On per Day
Unit 1				
Unit 2				
Unit 3				
Unit 4				
Unit 5				

PUMPS

Type (pool, spa, fountain, pond, sump, well)	Years Since Installation	Horsepower (HP)	Efficiency Rating? (s) Standard, (h) high, (p) premium	Motor Speed? (s) Single, (d) double, (v) variable	Timer?	Months of Use	Avg. Hours of Daily Use during months of use

FANS

Type (Attic, Whole house, Ceiling, Ventilation)	Years Since Installation	Horsepower (HP)	Energy Star?	Efficiency Rating? (s) Standard, (h) high, (p) premium	Months of Use	Avg. Hours of Daily Use during months of use

MISCELLANEOUS

Type (Water bed heater, humidifiers, dehumidifiers)	Years Since Installation	Energy Star?	Gallons per hour	Months of Use	Avg. Hours of Daily Use during months of use

WALL, ROOF, AND FLOOR INSULATION

58. Fill out the following information about the insulation of the home using the following codes:

(*a*) Roof Material	(*b*) Roof Color	(*c*) Attic Type
(T) Tile/Slate/Concrete (A) Asphalt Shingles (M) Metal or Membrane (W) Wood Shake	(D) Dark (L) Light (W) White	(N) None (Cathedral Ceiling) (V) Vented Attic (U) Unvented Attic

Reference Number	Roof Material (*a*)	Roof Color (*b*)	Attic Type (*c*)	Insulation Depth *(in)*	Radiant Barrier?	% Roof Area
1	T A M W	D L W	N V U		Y N	
2	T A M W	D L W	N V U		Y N	
3	T A M W	D L W	N V U		Y N	

Notes:	

(*b*) Construction	(*c*) Exterior Finish	(d) Insulation Type
(2x4) 2x4 Stick Built (2x6) 2x6 Stick Built (BW) Block Wall	(B) Brick/Block (ST) Stucco (SI) Siding	(B) Batts (L) Loose Fill (F) Expanded foam (O) Other

Wall Ref. Number	% of Total Above Grade Wall Area	Construction (*b*)	Ext. Finish (*c*)	Rigid Foam Insulation?	Insulation Type (d)
1A		2x4 2x6 BW	B ST SI	Y N	
2A		2x4 2x6 BW	B ST SI	Y N	
3A		2x4 2x6 BW	B ST SI	Y N	

Wall Ref. Number	% of Total Below Grade Wall Area	Insulation Thickness (in)	Rigid Foam Insulation?	Insulation Type (d)
1B				
2B				
3B				

Wall Ref. Number	% of Total Floor Area	Insulation Thickness (in)	Insulation Type (d)
1T			
2T			
3T			

Notes:	

WINDOWS

59. Fill out the following information about the windows of the home using the following codes:

(*a*) Type	(*b*) Orientation	(*c*) Shading	(*d*) Panes	(*e*) Frame	(*f*) Tinting
(O) Operable Window (F) Fixed Window (B) Bay Window (G) Garden Window (FD) French Door (SD) Sliding Door (SK) Skylight	(N) North (NE) Northeast (S) South (NW) Northwest (E) East (SE) Southeast (W) West (SW) Southwest (H) Horizontal (skylights only)	(D) Drapes (B) Blinds (SS) Solar Screen (WF) Window Film (N) None	(1) Single Pane (2) Double Pane (3) Triple Pane	(A) Aluminum/metal (W) Wood/ Vinyl	(C) Clear (T) Tinted (L) Low-e

Ref #	Type (*a*)	Orient (*b*)	Shade (*c*)	Panes (*d*)	Frame (*e*)	Tint (*f*)	Total Sq Feet	Overhang (Y/N)	Storm Window (Y/N?)
1				1 2 3	A W	C T L			
2				1 2 3	A W	C T L			
3				1 2 3	A W	C T L			
4				1 2 3	A W	C T L			
5				1 2 3	A W	C T L			
6				1 2 3	A W	C T L			
7				1 2 3	A W	C T L			
8				1 2 3	A W	C T L			
9				1 2 3	A W	C T L			
10				1 2 3	A W	C T L			
11				1 2 3	A W	C T L			
12				1 2 3	A W	C T L			
13				1 2 3	A W	C T L			
14				1 2 3	A W	C T L			
15				1 2 3	A W	C T L			
16				1 2 3	A W	C T L			
17				1 2 3	A W	C T L			
18				1 2 3	A W	C T L			
19				1 2 3	A W	C T L			
20				1 2 3	A W	C T L			
Notes:									

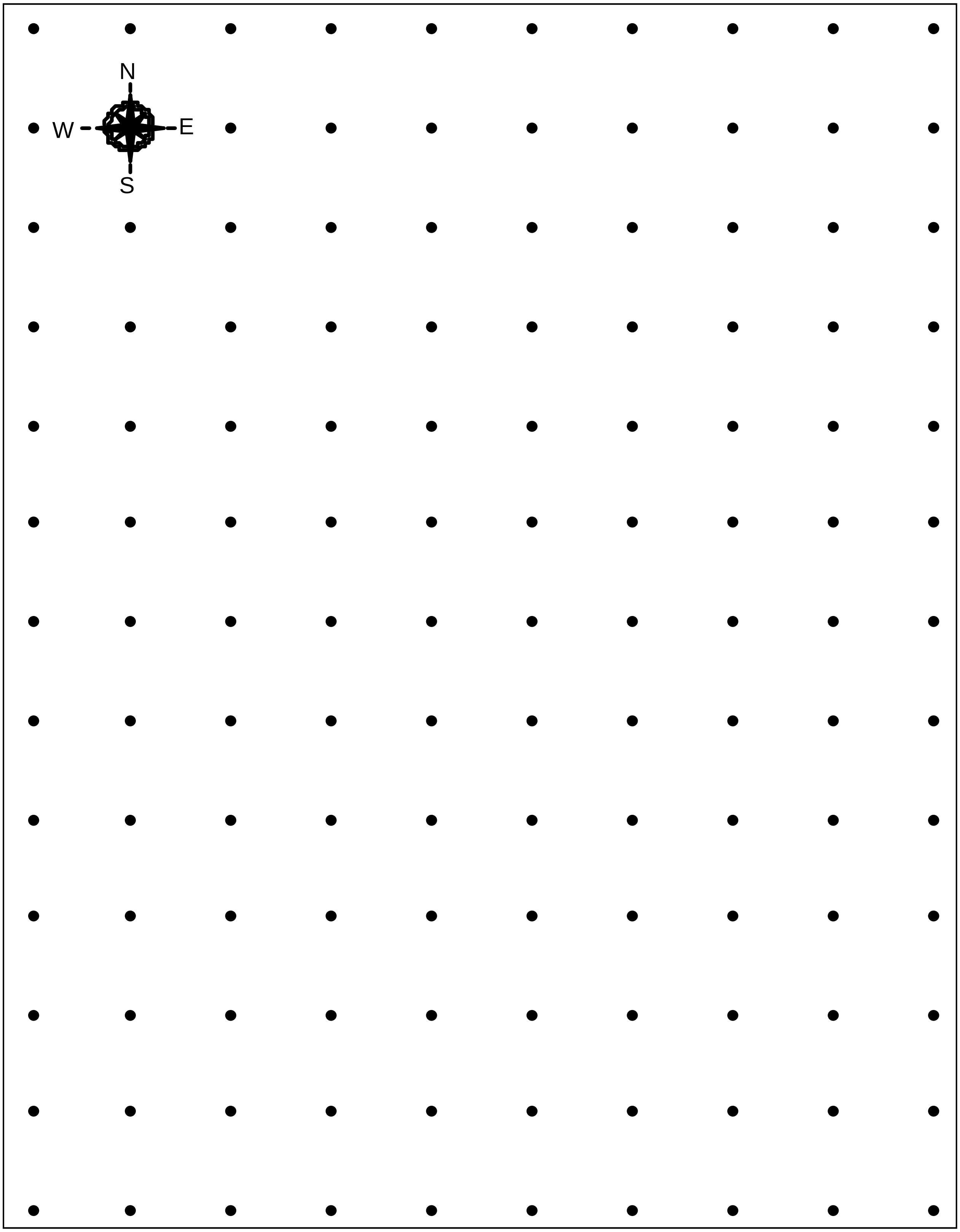
DOORS

60. Fill out the following information about the doors of the home using the following codes:

(*a*) Door Type	(*b*) Orientation	(*c*) Quality of Caulking/ Weather Stripping
(1) Hollow Wood	(1) North	(1) Good
(2) Solid Wood	(2) South	(2) Fair
(3) Sliding Glass Door	(3) East/West	(3) Poor or None
(4) French Doors	(4) SE	
(5) Other	(5) SW	
(6) Steel	(6) NE	
	(7) NW	
	(8) unconditioned indoors	

Reference Number	Type (*a*)	Orientation (*b*)	Quality (c)	Number of Doors	Total Area	Storm Door?
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

X. Sketch out the general outline of the residence floor plan and note the dimensions in feet.



Comments and Notes:

Question #	Comments/Explanations/Notes

Appendix K. 2012 C&I On-Site Survey Form

This appendix is provided in a separate file entitled "Appendix K – C and I Onsite Survey Form."

Appendix L. Detailed Potential Output

This appendix is provided in a separate Excel file entitled "Appendix L – Detailed Potential Output.xlsm"

NAVIGANT

DEMAND-SIDE RESOURCE POTENTIAL STUDY REPORT – DEMAND RESPONSE

Prepared for:
Kansas City Power and Light

KCP&L
energizing life

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August 2013

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1 Executive Summary

This section provides a high-level executive summary of the contents of this report.

1.1 *Introduction and Background*

Kansas City Power and Light (KCP&L) and KCP&L Greater Missouri Operations (KCP&L GMO) ("the Companies") selected Navigant to conduct a Demand Side Management ("DSM") Resource Potential Study in January, 2012. The Study objective was to assess the various categories of electrical energy efficiency and demand response potential in the residential, commercial, and industrial sectors for the Companies' service areas from 2014 to 2033. Portions of the study may be used by the Companies to satisfy some of the demand-side analysis requirements of the Missouri Public Service Commission Regulations for Electric Utility Resource Planning ("MO Planning Regulations").[1] Results of this Study will be used in the Companies' Integrated Resource Planning ("IRP") processes to analyze various levels of energy efficiency related savings and peak demand savings attributable to both energy efficiency initiatives and demand response initiatives at various levels of cost in support of the Companies' efforts to design highly effective potential demand-side programs that broadly cover the full spectrum of cost-effective end use measures for all customer market segments with the ultimate goal of achieving all cost-effective demand-side savings. As part of this study, Navigant also developed a suite of energy efficiency and demand response programs that were designed to achieve the savings deemed per this study to be "realistically achievable."

This document represents the Demand Response (DR) portion of the Demand Side Management ("DSM") Resource Potential Study and specifically presents the potential for peak demand savings attributable to demand response initiatives.

1.2 *Approach*

Navigant conducted the analysis for this study using its Demand Response Simulator (DRSim™) model. This model is designed to identify the critical component variables of peak demand impact, avoided cost estimates, program administration and evaluation costs, one-time startup costs, any incentive costs, and the appropriate population of potential participants. Navigant mirrored the model's approach after the methodology that the Federal Energy Regulatory Commission (FERC) used in its *National Assessment of Demand Response Potential*[2] (NADR), with a number of customizations added to specifically tailor the framework and inputs to the Companies.

Where possible, the analysis used inputs specific to the Companies, gathered through personal communications with the Companies, program documentation from the Companies, and KCP&L-GMO filings with the Missouri Public Service Commission (MO PSC).[3] Other resources referenced or

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[1] Rules of Department of Economic Development Division 240—Public Service Commission Chapter 22—Electric Utility Resource Planning (4 CSR 240-22.010) – http://sos.mo.gov/adrules/csr/current/4csr/4c240-22.pdf

[2] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

[3] Including Kansas City Power & Light Company. *2012 Integrated Resource Plan.* Case No. EO-2012-0323. April 2012.

incorporated included the Missouri DSM potential study,[4] the Ameren UE DSM potential study,[5] Electric Power Research Institute (EPRI) research,[6] FERC's 2012 DR survey results,[7] and FERC's NADR.[8] In addition to leveraging NADR to inform the model approach, Navigant also used FERC's study as a benchmark for the model's output and to provide model participation, peak demand reduction, and equipment cost inputs that were unavailable through other data sources.

To capture a range of potential DR impacts, Navigant assumed Realistic Achievable Potential and Maximum Achievable Potential DR scenarios. The significance of these scenarios is presented briefly below:

- **Realistic Achievable Potential** means demand savings relative to a utility's baseline demand forecast resulting from expected program participation and realistic implementation conditions. This scenario mirrors FERC's Expanded BAU scenario and represents the approximate peak load reductions that the Companies may achieve through expansion of their current DR initiatives and implementation of some new DR initiatives with "best practice" participation levels[9] and medium-term backend integration with the Companies' AMI to support opt-in time-based rates.
- **Maximum Achievable Potential** means demand savings relative to a utility's baseline demand forecast resulting from expected program participation and ideal implementation conditions. It is considered the hypothetical upper-boundary of achievable demand-side savings potential. This scenario mirrors FERC's Achievable Potential scenario and represents an estimate of the maximum achievable potential for reliability-based DR penetration, based on full-scale deployment of DR programs under ideal implementation conditions, default dynamic pricing tariffs, and accelerated backend integration with the Companies' AMI to support opt-out time-based rates.

1.3 Results

This section provides a high-level summary of Navigant's estimates of DR potential for KCP&L and KCP&L GMO that the Companies could achieve during reliability-based events. Navigant estimates up to 453 MW in peak load reduction potential for KCP&L-KS, 642 MW for KCP&L-MO, and 840 MW for KCP&L-GMO by 2033 in the Max Achievable scenario, which represents about 21.3, 28.2, and 31.0

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[4] "Missouri Statewide DSM Potential Study – Final Report." Published by KEMA Consulting. March 04, 2011.

[5] AmerenUE Demand-side Management (DSM) market Potential Study, Volume 3, prepared by Global Energy Partners, January 2010.

[6] Electric Power Research Institute. *Understanding Electric Utility Customers – Summary Report*. Report #1025856, Final Report, October 2012.

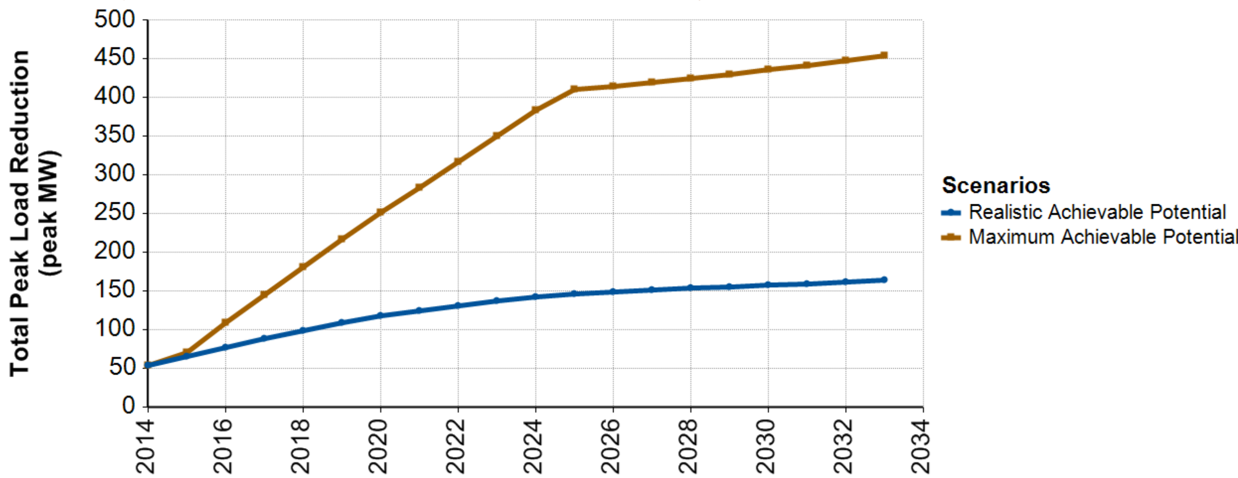
[7] Federal Energy Regulatory Commission, *2012 Survey on Demand Response and Advanced Metering*. Demand Response Survey Data, December 2012.

[8] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009. "National Demand Response Potential Model Guide", prepared for FERC, June 2009.

[9] This analysis uses FERC's interpretation of "best practices," where it refers only to "high rates of participation in demand response programs, not to a specific demand response goal nor the endorsement of a particular program design or implementation. The best practice participation rate is equal to the 75th percentile of ranked participation rates of existing programs of the same type and customer class." Source: Federal Energy Regulatory Commission. *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

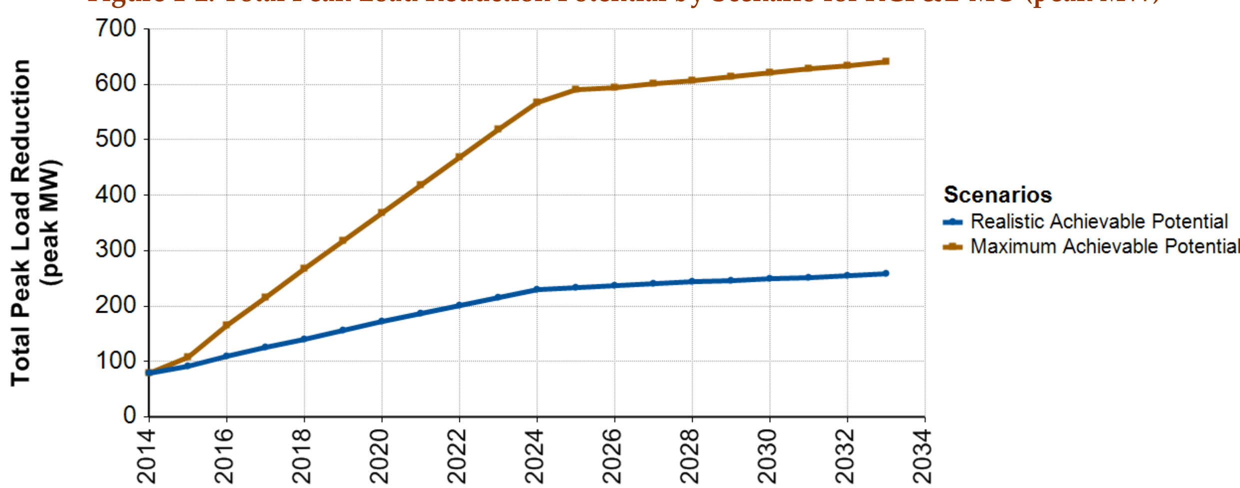
percent of each utility's forecasted peak load for 2033, respectively. The potential in the Max Achievable scenario reflects the peak load reductions that *could* be possible if the Companies were to drive new DR customer participation through targeted program marketing and investment in new infrastructure deployment and integration. These findings are benchmarked against the Realistic Achievable findings in Figure 1-1 through Figure 1-3 and Table 1-1, which show the total peak load reduction potential estimated for KCP&L-KS, KCP&L-MO, and KCP&L-GMO in each scenario.

Figure 1-1. Total Peak Load Reduction Potential by Scenario for KCP&L-KS (peak MW)



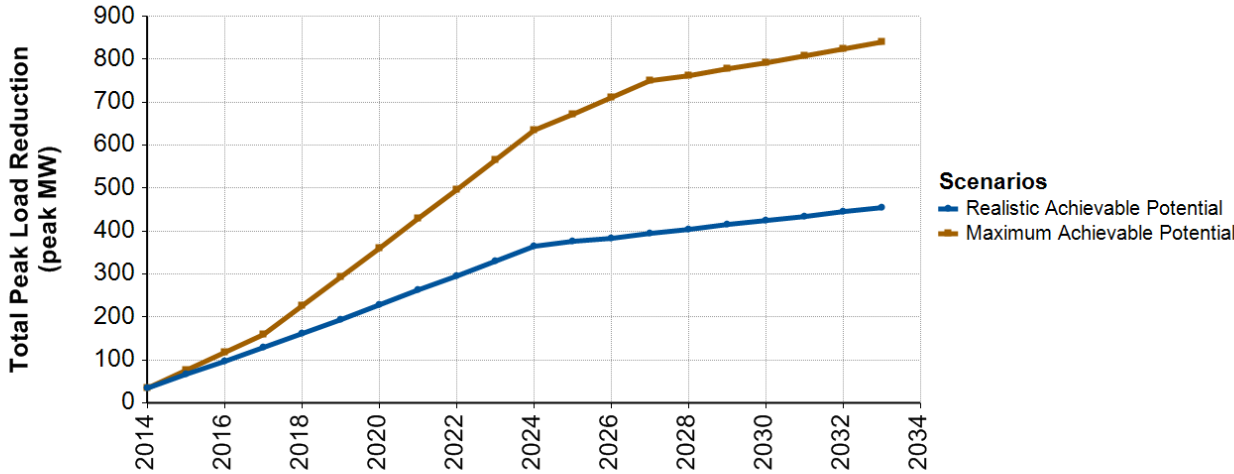
Source: Navigant analysis

Figure 1-2. Total Peak Load Reduction Potential by Scenario for KCP&L-MO (peak MW)



Source: Navigant analysis

Figure 1-3. Total Peak Load Reduction Potential by Scenario for KCP&L-GMO (peak MW)



Source: Navigant analysis

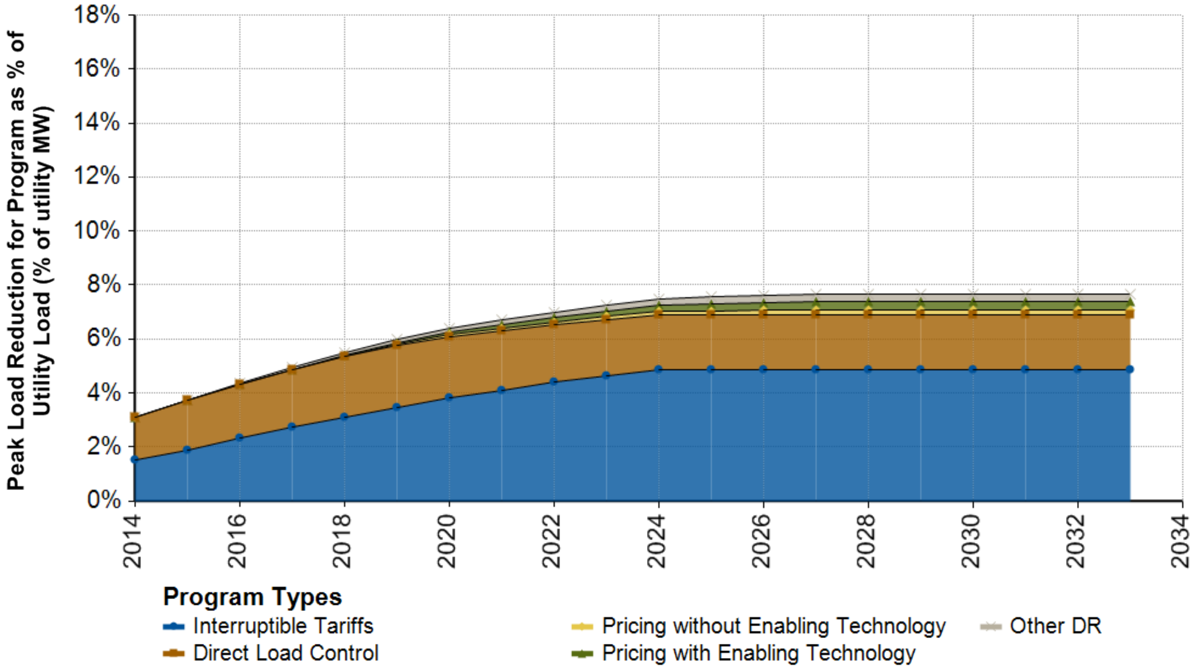
Table 1-1. Total Peak Load Reduction Potential by Scenario for the Companies (peak MW)

Utility	KCP&L-KS		KCP&L-MO		KCP&L-GMO	
Scenario	Realistic Achievable	Max Achievable	Realistic Achievable	Max Achievable	Realistic Achievable	Max Achievable
2014	54	54	78	78	36	36
2015	66	70	91	108	66	75
2016	77	109	110	164	98	117
2017	88	145	125	216	130	158
2018	99	181	141	267	162	226
2019	108	216	156	318	195	294
2020	117	251	172	368	229	361
2021	124	284	187	418	262	428
2022	130	317	201	468	296	497
2023	137	350	215	518	330	565
2024	143	383	230	568	365	636
2025	146	410	233	591	375	672
2026	148	413	237	594	384	710
2027	151	419	241	601	394	750
2028	153	424	243	607	404	760
2029	155	430	246	614	415	777
2030	157	436	249	621	425	792
2031	159	441	252	627	435	808
2032	161	447	255	634	445	824
2033	164	453	258	642	455	840

Source: Navigant analysis

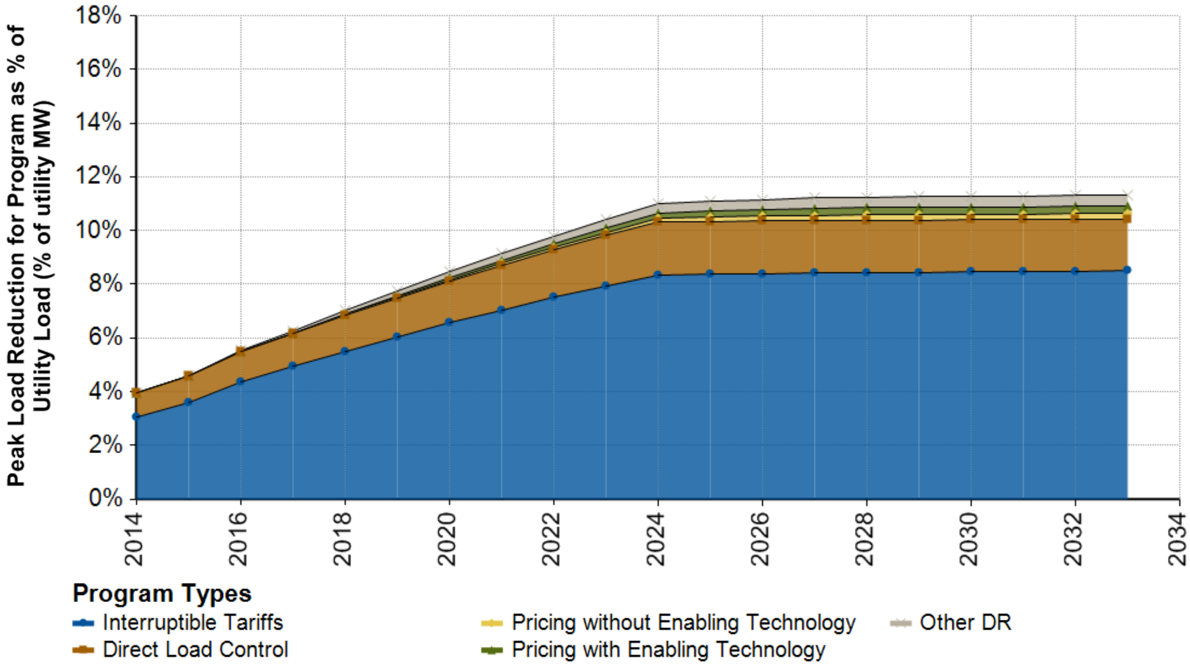
Variations between the three utilities are largely due to differences in total peak load, the mix of customers by rate class, and assumptions about customer load sizes and end uses that impact the amount of load a customer can reduce (e.g., large versus small industrials, higher versus lower air conditioning penetrations, etc.). Figure 1-4 through Figure 1-6 show the peak load reductions estimated in the Realistic Achievable scenarios for each of the Companies as the percentage of system load that could be reduced through different DR program types. This information is shown as tabular results for both the Realistic and Max Achievable scenarios in Appendix C – DR Demand Savings and Costs by Program Type.

Figure 1-4. Peak Load Reduction Potential for KCP&L-KS – Realistic Achievable Scenario (% of utility MW)



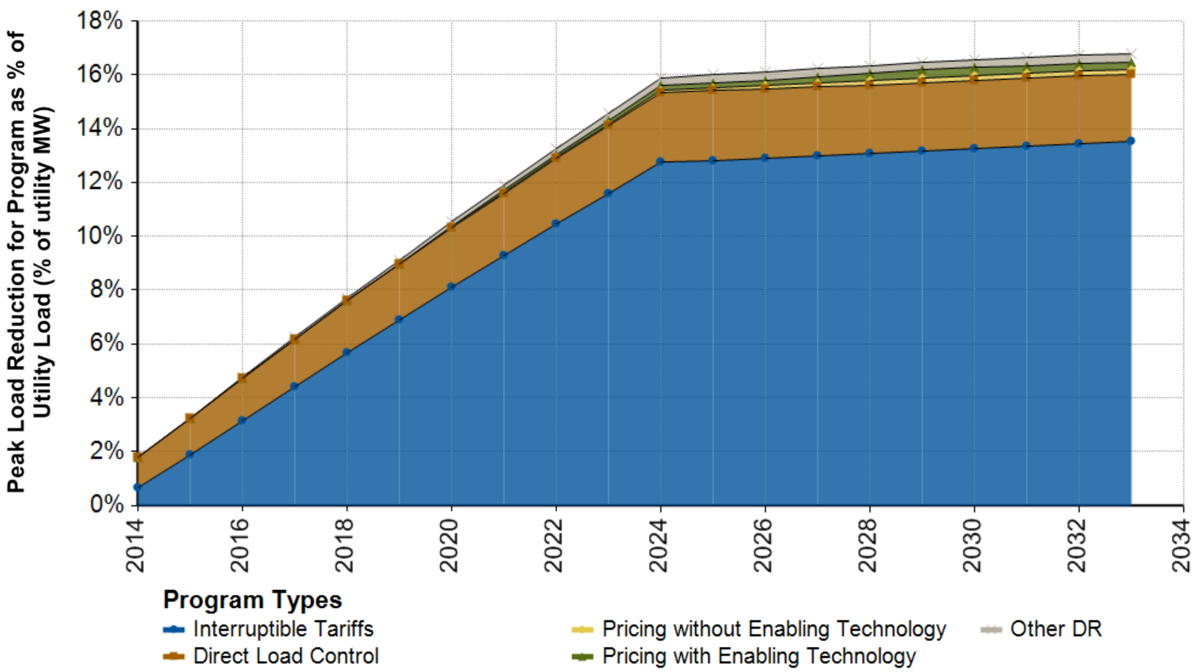
Source: Navigant analysis

Figure 1-5. KCP&L-MO Peak Load Reduction Potential – Realistic Achievable Scenario (% of utility MW)



Source: Navigant analysis

Figure 1-6. KCP&L-GMO Peak Load Reduction Potential – Realistic Achievable Scenario (% of utility MW)



Source: Navigant analysis

All of the scenarios show that significant potential growth still exists for the Companies' MPower Interruptible/Curtailable Tariff programs in the Medium and Large C&I customer segments, particularly in the KCP&L-MO and GMO territories. In contrast, participation rates in the Companies' Energy Optimizer Direct Load Control programs are already close to "best practice," though some additional potential exists. In the case of the pricing programs, the Max Achievable impacts are significantly higher than the Realistic Achievable impacts, which is due to the assumption that the pricing programs are opt-in in the Realistic scenario and opt-out in the Max Achievable scenario. Finally, while the cost effectiveness results suggest that the Other DR program may be cost effective, the potential peak reductions are relatively small.

- **Deployment of pricing programs is predicated on the backend integration of the Companies' AMI systems. While the Companies plan to deploy AMI across most of their service territories before 2020, the Companies do not have explicit plans to invest in the backend integration required to support time-based rates, such as installation of a Meter Data Management System (MDMS), which can add significant upfront costs to the program's deployment.**

- **The analysis includes the estimated costs of installing a MDMS[10] as a one-time startup cost for the pricing programs and finds that the pricing programs are cost effective when analyzed over a long-term horizon (i.e., the 20-year analysis period). However, we note that with relatively low near-term avoided capacity costs projected for the Companies, there is a significant time lag (10-15 years) before the cumulative program benefits surpass the cumulative program costs.**

- **This suggests that the timing of deployment for the pricing programs may warrant monitoring of capacity price forecasts and possibly aligning deployment with capacity price increases (which could shorten the effective payback time).**

Overall, this analysis finds significant potential for cost-effective DR program growth, with as much as 21-31 percent of each utility's peak demand in 2033 met by DR, as compared to less than 5 percent met by the Companies' existing programs. Furthermore, Navigant's cost-effectiveness analysis found that all of the program types are likely to be cost-effective over a 20-year horizon using the Total Resource Cost (TRC) benefit-cost test as a screen for all three of the utilities. These results reflect the estimated benefits from the continued promotion of the Companies' existing MPower and Optimizer programs, as well as investing in the infrastructure needed for backend integration of the Companies' AMI systems to support time-based rate programs.

[10] The MDMS installed cost assumed in this analysis of $1,000,000 is a reasonable initial estimate based on MDMS costs for other independently owned utilities; however, this cost can vary widely depending on the utility's system and functionality requirements, so the actual cost may be relatively uncertain.

2 Introduction

This section provides a brief introduction to the contents of this report, including a background discussion and summary of the study goals. This section also provides a summary of the report organization to facilitate reader navigation of its contents.

2.1 *Background and Study Goals*

Kansas City Power and Light (KCP&L) and KCP&L Greater Missouri Operations (KCP&L GMO) ("the Companies") selected Navigant to conduct a Demand Side Management ("DSM") Resource Potential Study in January, 2012. The Study objective was to assess the various categories of electrical energy efficiency and demand response potential in the residential, commercial, and industrial sectors for the Companies' service areas from 2014 to 2033. Portions of the study may be used by the Companies to satisfy some of the demand-side analysis requirements of the Missouri Public Service Commission Regulations for Electric Utility Resource Planning ("MO Planning Regulations").[11] Results of this Study will be used in the Companies' Integrated Resource Planning ("IRP") processes to analyze various levels of energy efficiency related savings and peak demand savings attributable to both energy efficiency initiatives and demand response initiatives at various levels of cost in support of the Companies' efforts to design highly effective potential demand-side programs that broadly cover the full spectrum of cost-effective end use measures for all customer market segments with the ultimate goal of achieving all cost-effective demand-side savings. As part of this study, Navigant also developed a suite of energy efficiency and demand response programs that were designed to achieve the savings deemed per this study to be "realistically achievable."

This document represents the Demand Response (DR) portion of the Demand Side Management ("DSM") Resource Potential Study and specifically presents the potential for peak demand savings attributable to DR initiatives.

In addition to these efforts, the Companies are currently engaged in DR research with the Electric Power Research Institute (EPRI) and KCP&L-MO's SmartGrid Demonstration Project. This research is also expected to meet some of the MO Planning Regulations. Navigant has collaborated throughout this project with EPRI and the SmartGrid Project and intends for this study to complement those efforts.

2.2 *Stakeholder Involvement*

Navigant involved a broad range of stakeholders throughout the study to ensure opportunity for review and comment of key study assumptions and methods was provided to those where were interested. Navigant invited the following organizations to each meeting and copied each of these stakeholders on correspondence providing key assumption and methodology files. Navigant reviewed and responded to stakeholder comments and distributed final documents to all stakeholders.

[11] Rules of Department of Economic Development Division 240—Public Service Commission Chapter 22—Electric Utility Resource Planning (4 CSR 240-22.010) – http://sos.mo.gov/adrules/csr/current/4csr/4c240-22.pdf

Stakeholders:

- KCP&L, KCP&L Greater Missouri Operations
- Missouri Public Service Commission
- Missouri Office of Public Counsel
- Missouri Department of Natural Resources
- National Resources Defense Council
- Empire Electric District
- Renew Missouri
- Ameren

Table 2-1 provides a summary of key stakeholder review meetings and relevant files pertaining to the review process.

Table 2-1. List of Stakeholder Meetings and Relevant Review and Response Files

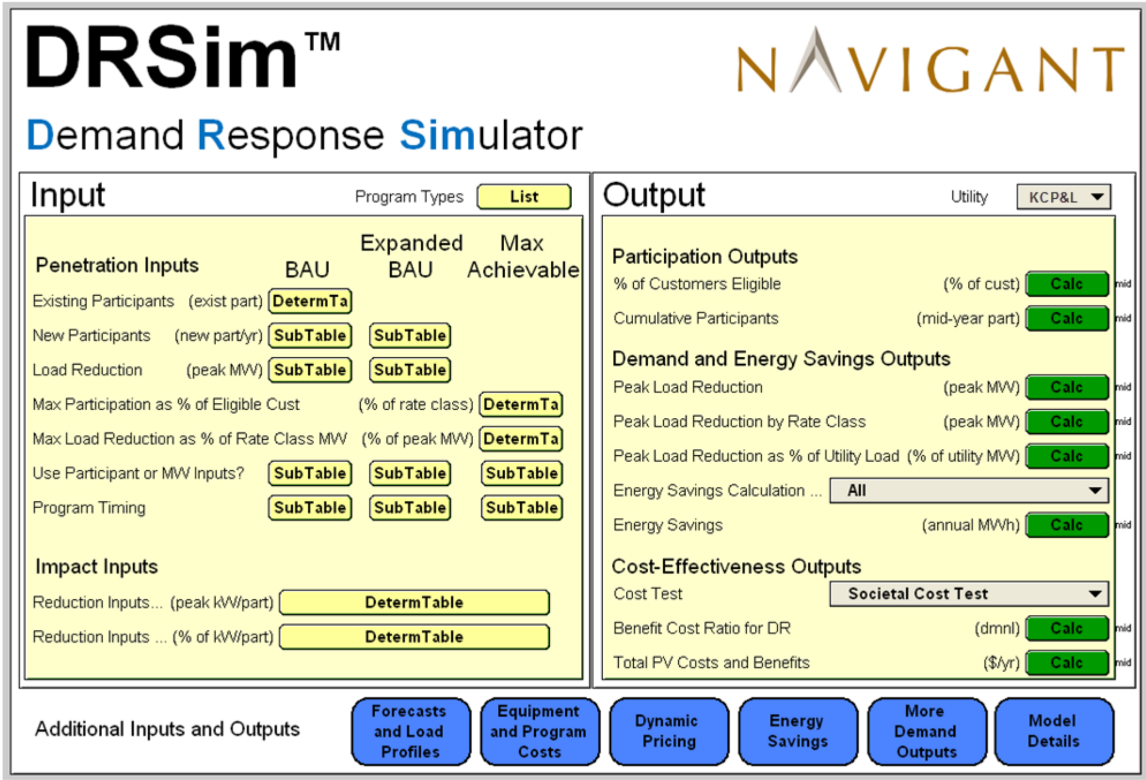
Review Item or Milestone	Review Type	Meeting Date (s)	Final File Date(s)	Relevant File Name(s)
DR Measures/ Approach	File for review	N/A	12/3/2012	KCPL_DR Measures-Approach Memo_07-17-12.docx
List of EE and DR Programs	File for review	N/A	12/3/2012	KCPL GMO Final Programs Matrix Dec 3 2012.docx
EE/DR Modeling Approach	Webinar	12/13/2012	12/13/2012, 01/03/2013, 01/14/2013	KCPL EEDR Demand Side Resource Potential Modeling Methodology 2012_12_13_R2.pdf; Response to KCPL and GMO StakeholderComments_2013_January_03 v4.docx; Response to KCPL and GMO StakeholderComments_2013_January_14;

2.3 *Demand Response Potential Model Description*

Navigant conducted the analysis for this study using its Demand Response Simulator (DRSim™) model. This model is designed to identify the critical component variables of peak demand impact, avoided cost estimates, program administration and evaluation costs, one-time startup costs, any incentive costs, and the appropriate population of potential participants. Navigant mirrored the model's approach after the methodology that the Federal Energy Regulatory Commission (FERC) used in its *National Assessment of Demand Response Potential*[12] (NADR), with a number of customizations added to specifically tailor the framework and inputs to the Companies. Although some DR programs included in this model could be deployed for economic considerations, the model output is intended to reflect the potential for peak load reduction that the Companies could achieve during reliability-based events. Figure 2-1 provides a screen capture of DRSim's graphical user interface.

[12] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

Figure 2-1. DRSim™ Graphical User Interface



Where possible, the analysis used inputs specific to the Companies, gathered through personal communications with the Companies, program documentation from the Companies, and KCP&L-GMO filings with the Missouri Public Service Commission (MO PSC).[13] Other resources referenced or incorporated included the Missouri DSM potential study,[14] the Ameren UE DSM potential study,[15] Electric Power Research Institute (EPRI) research,[16] FERC's 2012 DR survey results,[17] and FERC's NADR.[18] In addition to leveraging NADR to inform the model approach, Navigant also used FERC's study to provide model inputs that were unavailable through other data sources and as a benchmark for the model's output.

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[13] Including Kansas City Power & Light Company. *2012 Integrated Resource Plan*. Case No. EO-2012-0323. April 2012.

[14] "Missouri Statewide DSM Potential Study – Final Report." Published by KEMA Consulting. March 04, 2011.

[15] AmerenUE Demand-side Management (DSM) market Potential Study, Volume 3, prepared by Global Energy Partners, January 2010.

[16] Electric Power Research Institute. *Understanding Electric Utility Customers – Summary Report*. Report #1025856, Final Report, October 2012.

[17] Federal Energy Regulatory Commission, *2012 Survey on Demand Response and Advanced Metering*. Demand Response Survey Data, December 2012.

[18] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009. "National Demand Response Potential Model Guide", prepared for FERC, June 2009.

3 Methodology and Key Assumptions

This study leveraged assumptions and inputs from a variety of sources, including several different resources specific to the Companies and FERC's NADR, as discussed below.

3.1 Demand Response Program Types

This section provides brief overviews of five different DR program types included in the analysis. These program types are based on those referenced in NADR, as well as on specific initiatives that the Companies are currently considering or implementing. At a high-level, the results for these different program types inform the DR program design efforts Navigant is conducting in parallel with this potential study. These program types are briefly described more below.

Some DR program types, including most time-based rates, require interval data collection and often require two-way communications between the utility and the customer's meter. These functionalities are inherent in advanced metering infrastructure (AMI) meters, but typically require investment in systems like a Meter Data Management System (MDMS) and integration with the utility's billing system. While the Companies plan to deploy AMI across most of their service territories before 2020, the Companies do not have explicit plans to install a MDMS or integrate the AMI with the systems required to support time-based rates. An important assumption within both the Realistic and Maximum Achievable scenarios is that the Companies invest in the additional infrastructure needed to integrate the AMI with the Companies' DR programs and offer time-based rates.

<u>Interruptible/Curtailable Tariffs</u>

FERC defines an interruptible (or curtailable) tariff as a rate structure in which customers agree to reduce consumption to a pre-specified level, or by a pre-specified amount, during system reliability events in exchange for an incentive payment.[19] The analysis limits participation in this program type to Medium and Large C&I customers and assumes that participants do not require additional investments in AMI or other equipment for participation.

This program type represents the Companies' existing MPower peak load reduction programs for commercial and industrial customers, in which the Companies collaborates with customers to curtail (or reduce) their energy use during times of peak electric demand. Events may be called for reliability or economic reasons. Reductions are commonly achieved by reducing lighting and HVAC load, shutting down equipment, or switching facility load to an onsite generator. MPower provides customers with two forms of financial incentives: 1) a monthly "participation payment" for being "on call" to reduce power consumption at the Companies' request, and 2) an additional "event payment" for successfully reducing demand each time they are called upon to do so. Participants must be current electric customers on a non-residential rate, who are able to provide a minimum reduction of 25kW during the specified curtailment season and curtailment hours.

[19] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

Direct Load Control (DLC)

This program type is modeled after the Companies' existing Energy Optimizer programs for Residential and Small Commercial (R&SC) customers. In the Energy Optimizer program, the Companies provide a free programmable thermostat to residential and small commercial customers with peak demand less than 25 kW. The Companies then remotely raise the customer's thermostat setpoint or cycles the A/C equipment without notification to reduce system load on peak summer days.

Because the scope of this analysis is limited, we did not look at the potential for DLC in other end uses, such as water heating or pool pumps, due to the relatively low expected impact. These end uses may provide additional opportunity for peak load reduction beyond that presented here.

Pricing without Enabling Technology

Dynamic pricing refers to the family of rates that offer customers time-varying electricity prices on a day-ahead or real-time basis.[20] Examples of dynamic rates include time of use (TOU),[21] critical peak pricing (CPP), peak time rebates (PTR), and real-time pricing (RTP). Customers without enabling technology are assumed to manually curtail load in response to these dynamic time-varying pricing signals. Pricing signals can be communicated to customers via delivery mechanisms such as text messages, which avoid the need for additional investment in technologies such as in-home displays.

This analysis assumes that integrated AMI must be in place for a customer to be eligible for dynamic pricing. For residential customers, the analysis reflects the program impacts from a TOU rate in the Realistic Achievable scenario and a TOU with CPP rate in the Maximum Achievable scenario. The Companies are particularly interested in assessing TOU potential, given KCP&L-MO's current TOU pilot through the SmartGrid Demonstration Project, so it is specifically explored as part of this study. The program impacts for C&I customers are consistent with those assumed in the FERC NADR study, which does not assume a specific type of pricing.

Pricing with Enabling Technology

In this program type, customers are on a dynamic pricing rate, but also have enabling technology for automatic load curtailment. This analysis defines enabling technology as devices that automatically control load and reduce consumption during high-priced hours. Examples of enabling technology include Programmable Communication Thermostats (PCT), load switches, and Automated Demand Response (Auto-DR).[22] This analysis assumes that:

- The Residential, Small C&I, and Medium C&I customers with enabling technology have a PCT, whereas Large C&I customers have Auto-DR;
- Customer participation requires AMI; and

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[20] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

[21] While FERC's 2009 NADR study does not consider TOU a form of dynamic pricing, other industry definitions of dynamic pricing in more recent reports from EPRI and The Brattle Group include TOU as dynamic pricing. Sources: Electric Power Research Institute, *Understanding Electric Utility Customers – Summary Report.* Report #1025856, Final Report, October 2012. Faruqui, Ahmad, "Dynamic Pricing for Residential and Small C&I Customers", The Brattle Group, Presented to Ohio Public Utilities Commission, March 28, 2012.

[22] Automated Demand Response uses a customer's automated load control systems, such as an energy management system, to participate in DR events without manual intervention.

- Customers are offered the same pricing program types as in pricing without enabling technology.

Other DR

The assumed costs and impacts associated with this program type align with a curtailable load program targeted towards increased Small and Medium C&I customer participation. This new program would be an expansion of the Companies' existing MPower programs to Small and Medium C&I customers and may be a subset within the MPower program. No AMI would be needed to participate. Load curtailment through this program could be used for both economic and reliability-based dispatch.

3.2 *Model Scenarios*

To capture a range of potential DR impacts, Navigant assumed two DR potential scenarios: Realistic Achievable Potential and Maximum Achievable Potential. The primary differences between these scenarios relate to the assumed program participation levels, participant peak load reductions, and expected timing for AMI deployment and backend integration. Key inputs and assumptions for each scenario are discussed further in Sections 3.3 through 3.7.

3.2.1 Realistic Achievable Potential Assumptions

Realistic achievable potential means demand savings relative to a utility's baseline demand forecast, resulting from expected program participation and **realistic** implementation conditions. This scenario mirrors FERC's Expanded BAU scenario and represents the approximate peak load reductions that the Companies may achieve through expansion of their current DR initiatives and implementation of some new DR initiatives with "best practice" participation levels.[23] This scenario assumes that the Companies fully deploy AMI across KCP&L's and KCP&L GMO's territories according to their currently planned deployment schedule (i.e., by 2016 in KCP&L and 2020 in GMO) with at least partial backend integration by 2017 and 2019, respectively, to support opt-in time-based rates (see Table 3-4).

3.2.2 Maximum Achievable Potential Assumptions

Maximum achievable potential means demand savings relative to a utility's baseline demand forecast, resulting from expected program participation and **ideal** implementation conditions. Maximum achievable potential establishes a maximum target for demand-side savings that a utility can expect to achieve through its demand-side programs and may involve incentive or deployment costs that represent a very high portion of total programs costs. Maximum achievable potential is considered the hypothetical upper-boundary of achievable demand-side savings potential, because it presumes conditions that are ideal and not typically observed.

This scenario mirrors FERC's Achievable Potential scenario and represents an estimate of the maximum achievable potential for reliability-based DR penetration, based on full-scale deployment of DR

[23] This analysis uses FERC's interpretation of "best practices," where it refers only to "high rates of participation in demand response programs, not to a specific demand response goal nor the endorsement of a particular program design or implementation. The best practice participation rate is equal to the 75th percentile of ranked participation rates of existing programs of the same type and customer class." Source: Federal Energy Regulatory Commission. *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.

programs under ideal implementation conditions and default dynamic pricing tariffs. This scenario assumes backend integration with the Companies' AMI is accelerated to support opt-out time-based rates (see Table 3-4).

3.3 Market Characterization

This section discusses the analysis inputs that Navigant collected to define the DR potential market for the Companies. The inputs discussed below include the peak demand forecasts, number of customers forecast, customer load profiles, portion of customers with load suitable for automated control, and AMI deployment forecasts for the Companies.

3.3.1 Peak Demand and Customer Forecasts

This study uses FERC's definition of *peak* and assumes that DR occurs for 4 hours a day during the 15 highest load days of the year. As a result, the DR presented in this analysis reduces peak demand, but not necessarily demand during non-peak times.[24]

To tailor the DR potential estimate to the Companies' service territory, the team collected the peak load[25] and customer forecasts[26] for KCP&L-KS, KCP&L-MO, and KCP&L-GMO through 2033. The peak load forecasts provided by the Companies are without demand-side management (DSM)[27] and serve as the baseline for the analysis. The number of customers informs the maximum penetration of DR programs in the Max Achievable scenario (see Section 3.4.2).

3.3.2 Customer Rate Classes and Load Profiles

Because the potential for DR varies depending on the size and type of customer, the analysis divided the Companies' customers into the following rate classes:

» Residential[28]

» Small C&I (<25 kW)

» Medium C&I (25–200 kW)

» Large C&I (>200 kW)

These rate classes were chosen to maintain consistency with the rate classes used in NADR[29] and with KCP&L's General Service tariffs, which require a minimum demand of 25 kW for Medium General Service and 200 kW for Large General Service. Table 3-1 shows the average customer load profile for each rate class, based on the average peak load per customer under each tariff.

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[24] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009, p. 28.

[25] Maximum monthly load in each year from Coincident Peak Demand By Class (MW) from KCPL Energy Peak Customers.xls and GMO Energy Peak Customers.xls.

[26] Maximum monthly number of customers in each year from "KCPL Energy Peak Customers.xls" and "GMO Energy Peak Customers.xls". Excludes Street Lighting and Sales-for-resale.

[27] Confirmed via phone communications with Joe O'Donnell, GPES, December 17, 2012.

[28] Includes multi-family, as included in GPES's residential tariffs.

[29] FERC's DR potential study actually divides Small and Medium C&I at 20 kW; however, the distinction between 20 kW and 25 kW likely has no significant impact on the analysis.

Table 3-1. Average Customer Load Profiles (peak kW/customer)

Rate Class	Utility		
	KCP&L-KS	KCP&L-MO	KCP&L-GMO [30]
Residential	4.6	3.3	4.0
Small C&I (<25 kW)	3.0	3.9	2.0
Medium C&I (25-200 kW)	39.4	43.0	29.5
Large C&I (>200 kW)	408.7	685.5	456.8

Source: Navigant analysis, based on the Companies' peak demand and number of customer forecasts by rate class.

Table 3-2 shows the portion of customers with load (e.g., cooling load) suitable for participation in programs that require automated load control, such as DLC and pricing with enabling technology.

Table 3-2. Proportion of Customers with Suitable Load

	Percentage of Customers with Suitable Load	
Rate Class	Missouri	Kansas
Residential	87.5%	83.7%
Small C&I (<25 kW)	74%	74%
Medium C&I (25-200 kW)	77%	77%
Large C&I (>200 kW)	40%	40%

Source: Federal Energy Regulatory Commission, A National Assessment of Demand Response Potential. Prepared by The Brattle Group, June 2009.

Finally, Table 3-3 shows the program types that are considered in the DR potential model for each of these rate classes.

[30] Since KCP&L-GMO does not have a Medium General Service tariff, KCP&L-GMO's Small and Large General Service customers and load were divided into these rate classes by using the same proportion of customers and load in each rate class as in KCP&L.

Table 3-3. Overview of DR Program Types and Rate Classes Assessed

	Rate Classes			
Demand Response Programs	**R**	**S**	**M**	**L**
Interruptible/Curtailable Tariffs			X	X
Direct Load Control	X	X		
Pricing without Enabling Technology	X	X	X	X
Pricing with Enabling Technology	X	X	X	X
Other DR		X	X	
R = Residential, S = Small C&I, M = Medium C&I, L = Large C&I				

3.3.3 AMI Deployment Forecast

As discussed in Section 3.1, the analysis assumes that a customer must have access to an AMI meter integrated with the Companies' backend systems to participate in a pricing program. Through discussions with the Companies, Navigant has developed forecasts for when AMI will be deployed across each service territory, as well as a rough estimate of when the Companies might install MDM systems and integrate the AMI to support pricing programs. This forecast appears in Table 3-4 below for both scenarios and is an important driver in the deployment of time-based rates.

Table 3-4. Assumed Timing for AMI Deployment and Backend Integration to Support Time-Based Rates (% of customers)

Scenario	Utility	Year Backend Integration Occurs	AMI Deployment Forecast 2013	2014	2015	2016	2017	2018	2019	2020
Realistic Potential	KCP&L-KS	2017	0%	50%	80%	100%	100%	100%	100%	100%
	KCP&L-MO	2017	*	50%	80%	100%	100%	100%	100%	100%
	KCP&L-GMO	2019	0%	0%	0%	0%	0%	50%	80%	100%
Maximum Potential	KCP&L-KS	2015	0%	50%	80%	100%	100%	100%	100%	100%
	KCP&L-MO	2015	*	50%	80%	100%	100%	100%	100%	100%
	KCP&L-GMO	2017	0%	0%	50%	80%	100%	100%	100%	100%
*Commercial = 0.5%, Residential = 3%										

Note: Assumes one MDMS is installed in KCP&L and one is installed in KCP&L GMO.

Source: Based on email and phone communications with Joe O'Donnell, KCP&L, December 2012 and Navigant analysis.

The key differences between the two scenarios are the accelerated meter deployment for KCP&L-GMO and the accelerated backend integration for both utilities in the Maximum scenario, which allow time-based rates to be offered sooner in the Maximum scenario. For comparison, the Achievable Potential scenario in FERC's NADR study, which corresponds to the Maximum Achievable Potential scenario here, assumes full AMI deployment in Kansas and Missouri by 2019.

3.3.4 Customer Program Eligibility

The percentage of customers eligible for each program type is an important constraint on program participation, as described below in Section 3.4. Navigant estimated this percentage using the proportion of customers with load suitable for automated load control from Table 3-2 and customers with integrated AMI meters from Table 3-4. Table 3-5 shows how these constraints are applied to each program type.

Table 3-5. Requirements for DR Program Eligibility

Program Type	Requires Load Suitable for Automated Load Control?	Requires Integrated AMI?
Interruptible/Curtailable Tariffs		
Direct Load Control	Yes	
Dynamic Pricing w/o Enabling Technology		Yes
Dynamic Pricing w/ Enabling Technology	Yes	Yes
Other DR		
Time of Use		Yes

3.4 *Participation Assumptions*

The program participation inputs use a base case participation forecast provided by the Companies as the initial DR penetration in 2014 (see Table 3-6), then assume a maximum penetration of DR program deployment (see Table 3-7) and a number of years it takes to reach that maximum penetration for each scenario.[31] This approach is consistent with the methodology used in NADR.

3.4.1 Base Case Participation Inputs

Table 3-6 shows the participation in each program type at the start of the analysis in 2014, based on the Companies' currently planned DR program forecasts. MPower and Energy Optimizer are the only programs assumed to be available.

[31] The analysis assumes ten years for all program types and scenarios. Source: Oak Ridge National Laboratory, "Eastern Interconnection Demand Response Potential", ORNL/TM-2012/303, DRAFT, October 2012, "NADR-XL7v2s_S_20120710.xlsx." Based on high-case numbers from Faruqui, A. and D. Mitarotonda (2011). "Energy efficiency and demand response in 2020- a survey of expert opinion". Available at http://www.brattle.com/_documents/UploadLibrary/Upload990.pdf.

Table 3-6. Base Case Participation Inputs in 2014 (in kW)

Utility	Interruptible Tariffs	Direct Load Control	All Other Program Types
KCP&L-MO	59,997	18,000	0
KCP&L-KS	26,630	27,000	0
GMO	13,648	22,000	0

Sources:
Interruptible Tariffs: MPower forecast provided by Joe O'Donnell, KCP&L, "KCPL_GMO MPower forecast.xlsx", December 5, 2012.
Direct Load Control: Energy Optimizer forecast provided in National Association of Regulatory Utility Commissioners, Assessment of Demand-Side Resources Survey, Submitted by KCP&L on December 10, 2012.

KCP&L-MO is also currently offering a TOU rate and other residential smart grid DR strategies through its SmartGrid Demonstration Project (the "pilot") for residential customers in its Green Impact Zone. This pilot began in 2012 and will run through 2014. Since the Companies expect program participation to be limited to a few hundred customers, this program is not included in the potential analysis. However, the Companies expect that the pilot will help inform future program deployments, such as the potential deployment of a more widespread residential TOU rate.

3.4.2 Maximum Participation Inputs for Realistic and Maximum Achievable Scenarios

Table 3-7 shows the maximum penetration of DR program deployment, which is estimated as either a percentage of the total peak demand or a percentage of the eligible customers for each rate class, depending on the information available for each program and utility. These estimates are based on the "Expanded BAU" and "Achievable Participation" scenarios in Kansas and Missouri from either FERC's NADR or ORNL's recent update to NADR for the Eastern Interconnection.

Table 3-7. Maximum Participation Inputs for Realistic and Maximum Achievable Potential Scenarios (% of Rate Class MW or Eligible Customers)

Program Type	Participation Input	Scenario	Residential	Small C&I (<25 kW)	Medium C&I (25-200 kW)	Large C&I (>200 kW)
Interruptible Tariffs	% of rate class MW	Both	0%	0%	40%	40%
Direct Load Control	% of customers w/suitable load	Both	21%	20%	20%	20%
Pricing w/o Enabling Technology	% of customers w/AMI	Realistic	5%	5%	5%	5%
		Maximum	75%	75%	60%	60%
Pricing w/ Enabling Technology	% of customers w/suitable load & AMI	Realistic	2.9%	2.9%	2.9%	2.9%
		Maximum	42.7%	42.7%	34.2%	34.2%
Other DR	% of rate class MW	Realistic	0%	1.2%	7.2%	23.4%
		Maximum		20%	20%	

Source for Interruptible, Direct Load Control, and Other DR (Maximum): Oak Ridge National Laboratory, "Eastern Interconnection Demand Response Potential", ORNL/TM-2012/303, DRAFT, October 2012, "NADR-XL7v2s_S_20120710.xlsx." Based on high-case numbers from Faruqui, A. and D. Mitarotonda (2011). "Energy efficiency and demand response in 2020- a survey of expert opinion." Available at http://www.brattle.com/_documents/UploadLibrary/Upload990.pdf.
Source for Dynamic Pricing and Other DR (Realistic): Federal Energy Regulatory Commission. *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.
* All inputs are the same for Kansas and Missouri.
** Estimates presented here do not account for potential overlaps in program participation. Overlap is accounted for in final model output.

The maximum penetrations for the dynamic pricing programs shown in Table 3-7 depend on a variety of inputs, including the percentage of customers that 1) enroll in the programs, 2) are offered an automated load control device (e.g., PCT or load switch), 3) accept the automated load control device, and 4) in the case of pricing without enabling technology, are already enrolled in pricing with enabling technology. This approach leverages the methodology and inputs used in NADR. The relationship between these inputs is shown here for the Maximum Achievable scenario:

Maximum Achievable penetration for pricing with enabling technology:

60–75 percent of eligible customers enroll in dynamic pricing
× 95 percent of eligible customers are offered automated load control device
× 60 percent of eligible customers accept automated load control device
34–43 percent of eligible* customers enroll in dynamic pricing with enabling technology

**Eligible customers must have AMI and load suitable for auto load control.*

Maximum Achievable penetration for pricing without enabling technology:

60–75 percent of eligible customers enroll in dynamic pricing
\- 34–43 percent of eligible customers enrolled in dynamic pricing with enabling technology
26–32 percent of eligible* customers enroll in dynamic pricing without enabling technology

**Eligible customers must have AMI.*

Source: Navigant analysis and Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential.* "FERC_NADR-model.xls." Prepared by The Brattle Group, June 2009.

FERC's assumption that 60–75 percent of eligible customers enroll in dynamic pricing reflects an opt-out enrollment strategy and is based on market research and recent experience in California. The percentages of customers that are offered and accept an automated load control device reflect FERC's assumptions on the likelihood of the average utility and customer to make these decisions.[32]

3.4.3 Adjusting for Overlap in Participation

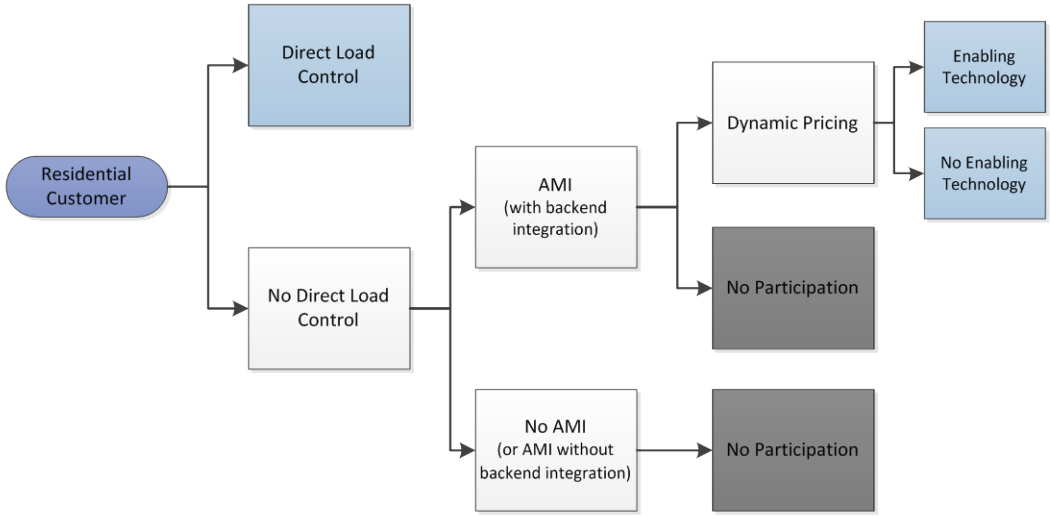
Although the maximum penetration rates shown in Table 3-7 do not account for the potential overlap in program participation across program types and customer segments, the final peak demand reductions are adjusted to account for participant overlap. Figure 3-1 through Figure 3-4 show the hierarchy for determining which program a customer participates in.

In the Realistic scenario, participation in MPower (i.e., Interruptible/Curtailable Tariffs) is the default customer choice for Medium and Large C&I participants and Optimizer (i.e., Direct Load Control) is the default customer choice for Residential Small C&I participants. Participants not enrolled in Interruptible/Curtailable Tariffs or Direct Load Control may choose to participate in either and opt-in Dynamic Pricing program or Other DR, depending on whether or not they have integrated AMI.

In the Maximum scenario, an opt-out pricing program is the default option for participation, assuming the customer has integrated AMI.

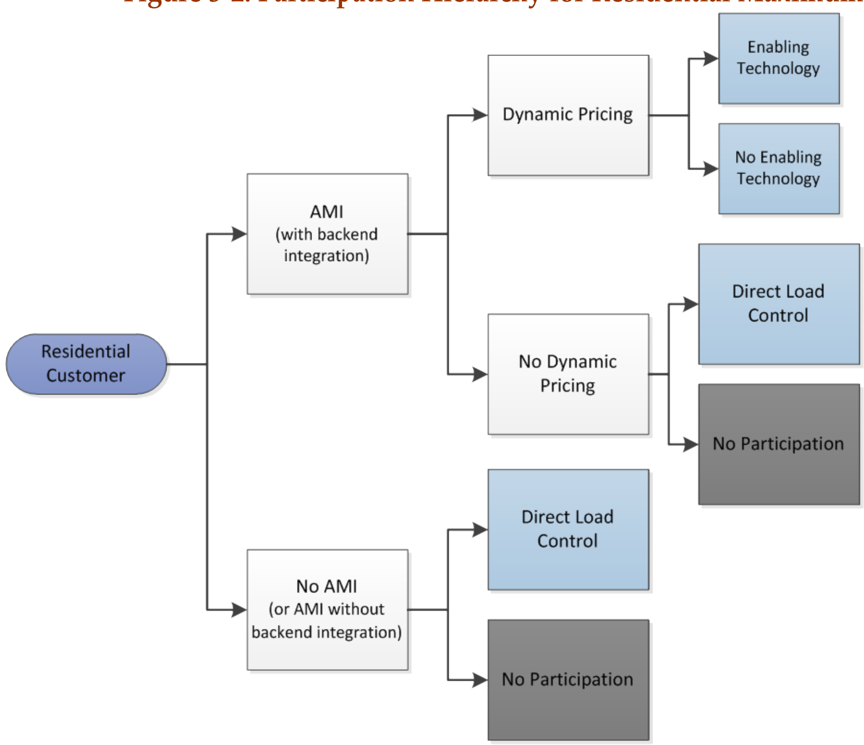
[32] Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009, p. 62.

Figure 3-1. Participation Hierarchy for Residential Realistic Achievable Scenario



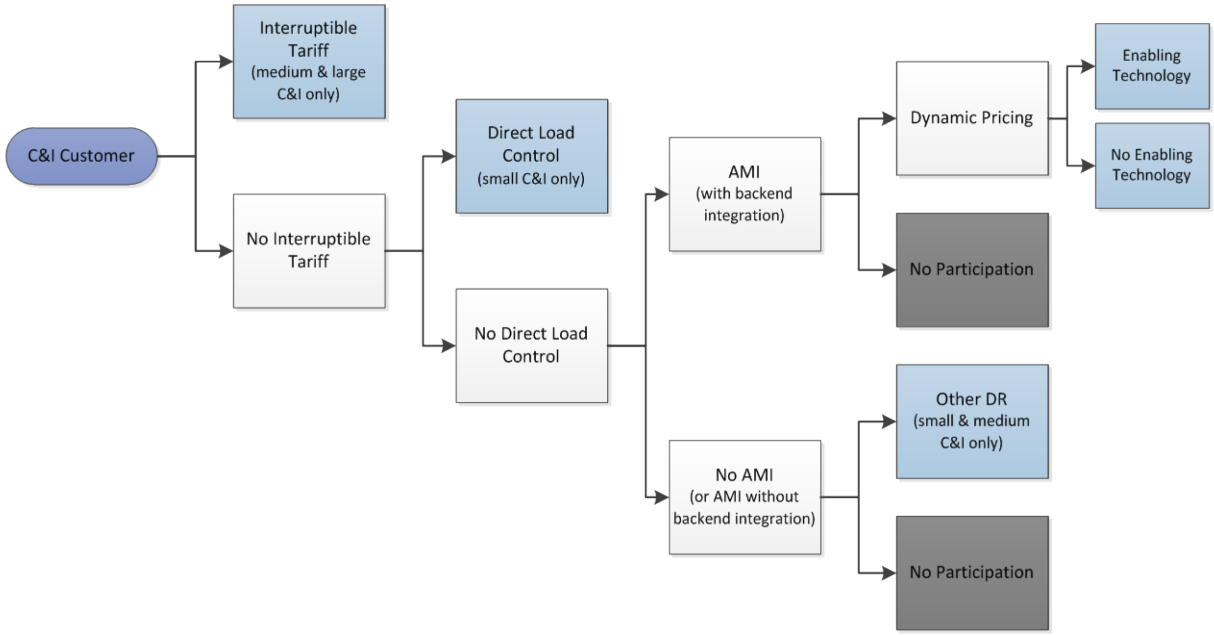
Source: Navigant analysis

Figure 3-2. Participation Hierarchy for Residential Maximum Achievable Scenario



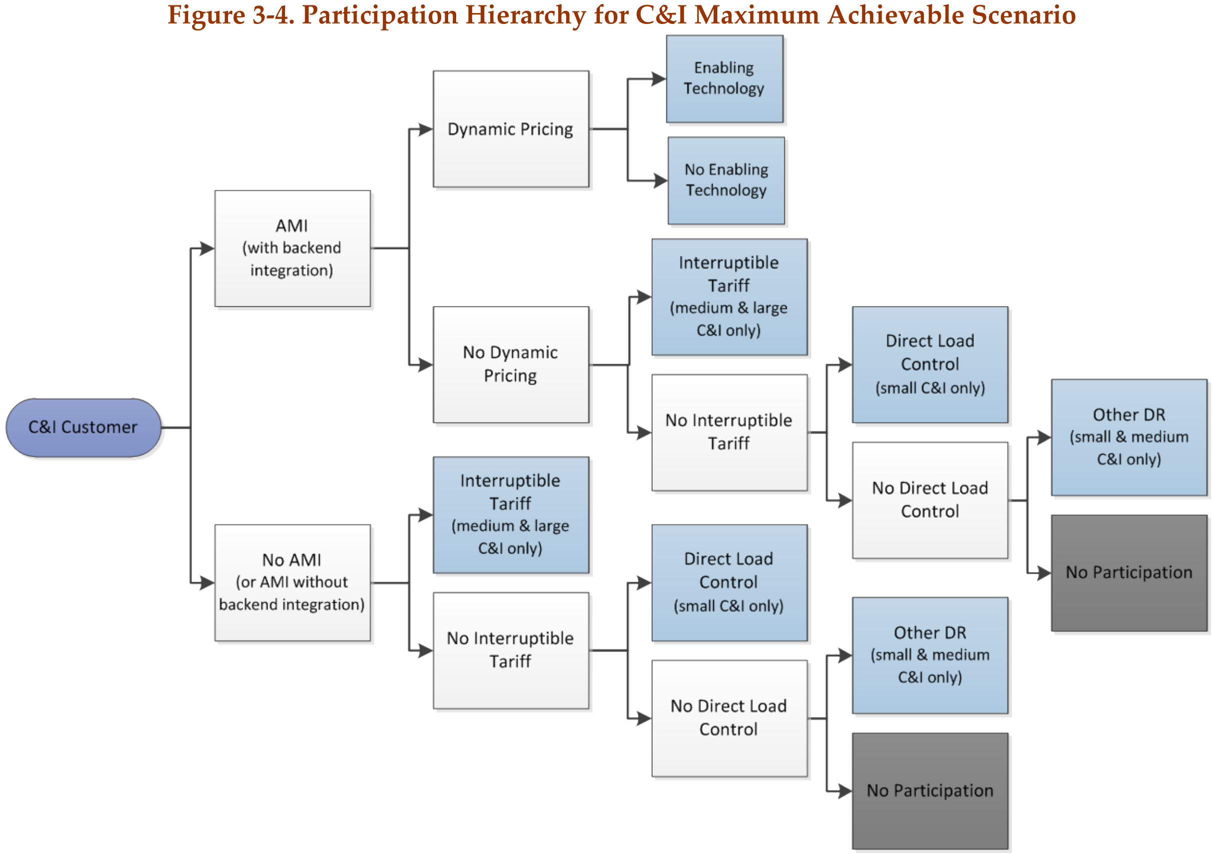
Source: Navigant analysis

Figure 3-3. Participation Hierarchy for C&I Realistic Achievable Scenario



Source: Navigant analysis

Figure 3-4. Participation Hierarchy for C&I Maximum Achievable Scenario



Source: Navigant analysis

3.5 Peak Demand Reduction Assumptions

The amount of peak demand reduced by each participant was calculated as a percentage of the average load profile for that participant's rate class (see Table 3-1). For residential pricing with and without enabling technology, Navigant assumes that the peak demand reductions in the Realistic Achievable scenario are roughly equivalent to the peak demand reductions for a customer on a TOU rate, while the peak demand reductions in the Maximum Achievable scenario are roughly equivalent to that of a TOU with CPP rate. The pricing programs with enabling technology assume peak demand reductions for the same rate types, but with the incremental benefit provided by enabling technologies. Table 3-8 shows the specific rate and demand reduction for each program and scenario, based on the impacts of various residential pricing pilots from EPRI.

Table 3-8. Assumed Peak Demand Reduction and Pricing Type for Each Scenario and Program Type

Program Type	Realistic Achievable	Maximum Achievable
Pricing without Enabling Technology	TOU 7%	TOU with CPP 18%
Pricing with Enabling Technology	TOU + Technology 18%	TOU with CPP + Technology 30%

Source: Based on the averaged load reductions for Residential pricing pilots with and without enabling technology. Electric Power Research Institute, Understanding Electric Utility Customers - Summary Report. Report #1025856, Final Report, October 2012.

For Interruptible Tariffs and Direct Load Control in the Realistic Achievable scenario, Navigant used actual 2012 peak demand reduction values from the Companies' MPower and Optimizer programs by utility. Unless the MPower and Optimizer values were higher than what FERC assumed,[33] Navigant used FERC's NADR assumptions for all other demand reduction inputs in the Realistic and Maximum Achievable scenarios.[34]

3.6 Energy Savings from Demand Response

Navigant conservatively assumes there are no significant energy savings from the Companies' DR programs in any scenario. While some studies have found conservation from DR, this assumption is consistent with typical industry assumptions for dispatchable programs like Direct Load Control and Interruptible Tariffs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU.[35]

[33] The Companies' actual reductions were slightly higher than FERC's estimated reductions for Large C&I MPower participants in KCP&L-KS and Optimizer participants in KCP&L.

[34] Navigant used FERC's default average participant load reductions from the Achievable scenario, including the price ratio assumptions for dynamic pricing, with minor exceptions.

[35] Email communications with David Walls, Navigant Consulting, Inc., January 2013 regarding energy use with TOU for some DOE Smart Grid Investment Grant recipients.

3.7 *Program Costs and Benefits*

The cost-effectiveness analysis looked at the utility program administration costs; vendor program administration costs; evaluation, measurement, and verification (EM&V) costs; incentive costs; and avoided costs for each DR program type. These costs were included as the following:

- **Ongoing program costs:** An estimated cost per kilowatt of savings ($/kW-year) for each cost category and program type that applies to new and existing program participants.
- **New participant costs:** A cost per new participant ($/new participant), which includes the incremental costs for new participants associated with equipment installation and marketing.
- **One-time costs:** A one-time annual cost ($/yr) for a limited number of startup or capital costs applied within the utility administration cost category.

To distinguish the Companies' in-house administrative costs from outsourced costs, the program administration costs are divided into the utility and vendor administration cost categories. The utility administration costs assumed in this model reflect the up-front costs for program development and MDMS installation; the ongoing in-house costs for implementation and delivery, such as program delivery, marketing, and administration costs; and the marketing for new participants. The vendor administration costs reflect all outsourced costs and include ongoing costs for implementation and delivery, as well as any incremental equipment costs associated with new participants. For the purposes of this analysis, the capital and installation costs associated with equipment installed at the customer site are included in the vendor administration category and treated as costs to the utility and ratepayer, rather than the participant. This assumption is consistent with the current design of the Energy Optimizer program, as well as many other utility DR programs within the industry.

Since the cost structures in the Realistic and Maximum Achievable scenarios for MPower are not expected to change significantly from the base case cost forecasts provided by the Companies, Navigant used the cost estimates provided by the Companies for MPower as the Interruptible Tariffs costs for both scenarios.

This section describes the inputs and assumptions driving the various cost inputs, and how they are applied in more detail below.

Ongoing Program Costs

Table 3-9 below summarizes the ongoing program costs assumed for each cost category and program type.

Table 3-9. Summary of Ongoing Program Costs by Cost Category ($/kW-yr)[1,2]

Program Type	Utility Admin	Vendor Admin	EM&V	Incentive
Interruptible Tariffs	** $6	$3	$3	$46-50
Direct Load Control	$2	$30	$3	$0
Pricing w/o Enabling Technology	$5	$30	$3	$0
Pricing w/ Enabling Technology	$5	$30	$3	$0
Other DR	$15	$45	$5	$57 **

1. These are the estimated costs from 2014-2017, with an assumed escalation rate of 2.5 percent per year applied starting in 2018 to be consistent with the cost assumptions in the MPower forecast provided by the Companies.
2. Actual costs in the model vary slightly by utility based on forecasts provided by the Companies.
Interruptible Tariffs: "KCPL_GMO MPower forecast.xlsx" provided by Joe O'Donnell, KCP&L, August 2012.
Direct Load Control and Pricing: Estimated from benchmarking of similar programs.
Pricing and Other DR: Navigant analysis. Global Energy Partners, *Tennessee Valley Authority Potential Study*, Report Number 1360, December 21, 2011.

The assumptions for Direct Load Control *vendor* administration costs were also applied to the pricing programs, since they are assumed to have similar vendor requirements. However, Navigant assumed a slightly higher *utility* administration cost for the pricing programs than for Direct Load Control programs, based on cost estimates from Global Energy Partners (GEP).[36] For Other DR, the vendor administration costs are assumed to be 50 percent higher than the Direct Load Control costs, based on the additional communications and control technologies that would likely be needed for small and medium C&I customers to participate effectively. Finally, the Other DR program's utility administration costs reference GEP's administrative cost estimate for a C&I capacity reduction program of $15/kW-yr.

The EM&V costs are based on KCP&L and KCP&L GMO's MPower and Energy Optimizer costs forecasts, and are assumed to be roughly equivalent for all programs except the Other DR program. A slightly higher EM&V cost is assumed for the Other DR program, since it is a less commonly implemented program type within the industry.

Finally, incentive costs are only assumed for Interruptible Tariffs and the Other DR program. The Interruptible Tariffs program uses the forecasted MPower incentive costs provided by the Companies and Other DR references GEP's cost estimates for a C&I capacity reduction program.

[36] Global Energy Partners, *Tennessee Valley Authority Potential Study*, Report Number 1360, December 21, 2011.

New Participant Costs

New participant costs are assumed for all program types except Interruptible Tariffs. The number of new participants each year is based on the annual program growth minus participants that dropped out of the program. The latter is captured through an assumed rate of attrition, which varies between one and five percent each year in this analysis, based on program type and standard industry assumptions.

Under the utility administration cost category, a $50 marketing cost is assumed for each new participant in all program types except for Interruptible Tariffs.[37]

Table 3-9 below shows the assumed vendor administration costs for new participants, which largely reflect the installed costs of the equipment required for participation in each program type. No incremental equipment costs are assumed for participation in Interruptible Tariffs or Pricing without Enabling Technology. The Residential and Small C&I costs are based on the estimated installed cost of a controllable thermostat in the Companies' Energy Optimizer programs. These costs are higher than many other assumptions for installed thermostat costs, particularly for Residential, and are thought to be conservative. The Medium and Large C&I costs are reasonable average assumptions, but could be much higher for very large C&I customers.

Table 3-10. Vendor Administration Costs for New Participants by Cost Category and Rate Class ($/new participant)*

Program Type	Residential	Small C&I	Medium C&I	Large C&I
Interruptible Tariffs	-	-	$0	$0
Direct Load Control	$380	$380	-	-
Pricing w/o Enabling Technology	$0	$0	$0	$0
Pricing w/ Enabling Technology	$380	$380	$1050	$2000
Other DR	-	$380	$1050	-

* These are the estimated costs from 2014-2017, with an assumed escalation rate of 2.5 percent per year applied starting in 2018 to be consistent with the cost assumptions in the MPower forecast provided by the Companies.
Residential and Small C&I: Based on benchmarking of typical installed cost of controllable thermostats.
Medium C&I: Based on vendor estimates and utility program cost data for the installed cost of programmable communicating thermostats and remotely-controlled switches from programs with similar DR options. Federal Energy Regulatory Commission, *A National Assessment of Demand Response Potential*. Prepared by The Brattle Group, June 2009.
Large C&I: Based on estimated installed cost of automated demand response (Auto-DR) for large C&I customers. Global Energy Partners, *Tennessee Valley Authority Potential Study*, Report Number 1360, December 21, 2011.

One-Time Costs

The analysis includes one-time program development costs for the startup of new programs, as well as the cost of a new MDMS to fully integrate the Companies' AMI meters and support time-based rates. The cost of the AMI meters is not included in the DR cost effectiveness analysis, since it is assumed these meters are deployed independently of the DR programs to provide meter reading benefits.

[37] Navigant analysis for Tucson Electric Power on cost effectiveness of mass market Direct Load Control, 2009. Global Energy Partners, *Tennessee Valley Authority Potential Study*, Report Number 1360, December 21, 2011.

These costs are each incurred once for KCP&L and once for KCP&L-GMO. The model then apportions the costs for KCP&L by state based on the number of KCP&L participants in each state.
The assumed program development costs include $400,000[38] for the Other DR program and a single $400,000 cost shared across both Pricing programs in the year the programs begin. No program development cost is applied to the Interruptible Tariff and Direct Load Control programs.

The installed cost of an MDMS is estimated to be around $1,000,000, based on the estimated cost of Ameren's MDMS,[39] although this cost may vary significantly depending on the selected vendor and choice of options.

Total Program Costs

Table 3-11 through Table 3-13 provide a breakdown, by program, of the forecast cumulative budget from 2014 through 2033. The budget values include the incentive costs, non-incentive costs (i.e., program administration and on-time costs), and EM&V costs presented above. Budgets over the 20-year forecast horizon range from $191 million to $476 million depending on the utility. The 10-year average annual budget for each utility is $7.1 million, $10.4 million, and $13.7 million for KCP&L-KS, KCP&L-MO, and KCP&L-GMO, respectively. The budgets for the Maximum Achievable Potential scenario are also presented in Appendix C.

[38] Global Energy Partners, *Tennessee Valley Authority Potential Study*, Report Number 1360, December 21, 2011.
[39] Navigant Consulting, Inc. *Advanced Metering Infrastructure (AMI) Future Program Study.* Prepared for FortisBC. March 2011.

Table 3-11. Cumulative Realistic Achievable DR Budget – KCP&L-KS

Year	Interruptible Tariffs	Direct Load Control	Pricing without Enabling Technology	Pricing with Enabling Technology	Other DR	Total
2014	$1,549,067	$4,122,985	$0	$0	$0	**$5,672,052**
2015	$3,491,026	$8,411,081	$0	$0	$179,943	**$12,082,050**
2016	$5,889,817	$11,810,172	$0	$0	$288,141	**$17,988,131**
2017	$8,726,582	$14,983,312	$381,474	$339,618	$460,874	**$24,891,860**
2018	$12,070,918	$17,965,630	$424,926	$591,819	$704,784	**$31,758,078**
2019	$15,923,140	$20,709,160	$484,813	$877,991	$1,022,328	**$39,017,432**
2020	$20,294,450	$23,165,387	$562,433	$1,202,531	$1,418,352	**$46,643,152**
2021	$25,177,009	$24,864,815	$659,098	$1,570,261	$1,894,779	**$54,165,962**
2022	$30,569,599	$26,574,576	$777,172	$1,993,311	$2,456,680	**$62,371,338**
2023	$36,475,916	$28,291,242	$916,980	$2,467,111	$3,108,551	**$71,259,800**
2024	$42,890,438	$30,024,685	$1,079,919	$2,994,933	$3,851,398	**$80,841,373**
2025	$49,540,734	$32,408,813	$1,267,350	$3,579,215	$4,692,248	**$91,488,360**
2026	$56,434,583	$34,879,529	$1,479,344	$4,211,486	$5,541,486	**$102,546,428**
2027	$63,589,239	$37,437,496	$1,719,322	$4,906,362	$6,424,591	**$114,077,010**
2028	$71,024,731	$40,081,466	$1,928,790	$5,317,219	$7,346,515	**$125,698,721**
2029	$78,739,050	$42,816,534	$2,146,021	$5,742,675	$8,304,880	**$137,749,161**
2030	$86,753,359	$45,647,766	$2,371,408	$6,183,546	$9,304,964	**$150,261,042**
2031	$95,077,834	$48,579,701	$2,605,261	$6,640,547	$10,346,911	**$163,250,254**
2032	$103,712,529	$51,621,418	$2,847,954	$7,114,948	$11,433,869	**$176,730,718**
2033	$112,689,168	$54,777,102	$3,100,068	$7,607,441	$12,567,175	**$190,740,954**

Source: Navigant analysis

Table 3-12. Cumulative Realistic Achievable DR Budget – KCP&L-MO

Year	Interruptible Tariffs	Direct Load Control	Pricing without Enabling Technology	Pricing with Enabling Technology	Other DR	Total
2014	$3,477,426	$636,799	$0	$0	$0	**$4,114,225**
2015	$7,591,966	$2,729,299	$0	$0	$220,057	**$10,541,321**
2016	$12,617,933	$4,928,403	$0	$0	$369,070	**$17,915,406**
2017	$18,335,814	$7,231,666	$346,690	$332,218	$612,421	**$26,858,809**
2018	$24,898,453	$9,692,706	$395,364	$628,903	$959,949	**$36,575,376**
2019	$32,326,148	$12,331,548	$462,131	$956,215	$1,418,697	**$47,494,740**
2020	$40,632,047	$15,159,395	$547,757	$1,315,108	$1,992,854	**$59,647,161**
2021	$49,841,088	$18,180,108	$653,129	$1,706,737	$2,688,239	**$73,069,301**
2022	$59,962,270	$21,405,269	$779,117	$2,132,208	$3,511,345	**$87,790,210**
2023	$71,017,500	$24,852,911	$926,718	$2,592,825	$4,470,635	**$103,860,589**
2024	$83,022,805	$28,536,683	$1,097,005	$3,090,045	$5,570,975	**$121,317,514**
2025	$95,451,967	$30,913,721	$1,291,125	$3,625,197	$6,821,831	**$138,103,840**
2026	$108,339,521	$33,363,128	$1,515,915	$4,240,162	$8,097,003	**$155,555,730**
2027	$121,712,194	$35,886,224	$1,770,192	$4,911,313	$9,429,542	**$173,709,466**
2028	$135,586,186	$38,484,837	$1,995,775	$5,286,093	$10,819,222	**$192,172,113**
2029	$149,988,495	$41,160,772	$2,229,322	$5,673,246	$12,273,980	**$211,325,815**
2030	$164,936,865	$43,919,299	$2,471,184	$6,073,328	$13,795,976	**$231,196,651**
2031	$180,449,598	$46,761,572	$2,721,616	$6,486,467	$15,385,420	**$251,804,672**
2032	$196,521,394	$49,694,115	$2,980,772	$6,913,556	$17,042,920	**$273,152,757**
2033	$213,206,648	$52,720,073	$3,249,310	$7,355,491	$18,780,128	**$295,311,650**

Source: Navigant analysis

Table 3-13. Cumulative Realistic Achievable DR Budget – KCP&L-GMO

Year	Interruptible Tariffs	Direct Load Control	Pricing without Enabling Technology	Pricing with Enabling Technology	Other DR	Total
2014	$855,866	$2,120,877	$0	$0	$0	**$2,976,743**
2015	$3,220,864	$6,032,880	$0	$0	$400,000	**$9,653,744**
2016	$7,253,894	$9,601,568	$0	$0	$548,055	**$17,403,516**
2017	$12,984,682	$13,221,707	$0	$0	$777,505	**$26,983,893**
2018	$20,640,870	$16,977,142	$0	$0	$1,098,005	**$38,716,017**
2019	$30,345,273	$20,866,198	$715,592	$684,408	$1,514,685	**$54,126,156**
2020	$42,205,351	$24,875,235	$773,417	$1,057,969	$2,032,768	**$70,944,741**
2021	$56,362,567	$28,669,406	$850,790	$1,474,788	$2,658,386	**$90,015,937**
2022	$72,966,431	$32,741,589	$948,860	$1,939,501	$3,397,699	**$111,994,080**
2023	$92,106,086	$37,120,052	$1,068,195	$2,452,476	$4,254,458	**$137,001,267**
2024	$113,991,661	$41,836,470	$1,209,770	$3,015,944	$5,238,143	**$165,291,988**
2025	$136,963,457	$45,406,291	$1,374,631	$3,631,880	$6,356,586	**$193,732,844**
2026	$161,033,069	$49,105,253	$1,569,612	$4,336,141	$7,488,879	**$223,532,953**
2027	$186,330,540	$52,936,278	$1,794,976	$5,114,138	$8,674,497	**$254,850,429**
2028	$212,901,993	$56,897,123	$2,052,792	$5,968,366	$9,912,729	**$287,733,003**
2029	$240,889,355	$60,996,259	$2,345,768	$6,903,969	$11,210,038	**$322,345,390**
2030	$270,314,526	$65,238,224	$2,599,276	$7,436,372	$12,565,374	**$358,153,771**
2031	$301,231,904	$69,634,047	$2,863,905	$7,989,447	$13,980,971	**$395,700,274**
2032	$333,765,056	$74,189,239	$3,140,322	$8,564,291	$15,460,415	**$435,119,322**
2033	$367,906,672	$78,913,705	$3,428,753	$9,161,892	$17,007,451	**$476,418,473**

Source: Navigant analysis

Other Cost-Effectiveness Inputs

In addition to the cost inputs described above, Navigant tailored FERC's assumptions for avoided costs and discount rate to the Companies to determine the cost-effectiveness of each DR program. For consistency, the DR model uses the same discount rate[40] and avoided demand costs[41] as the Demand Side Management Simulator (DSMSim™) model that Navigant created to estimate the Demand Side Management (DSM) potential for the Companies.

Note that the cost-effectiveness analysis does not consider bill reductions or lost revenues because the model does not assume any energy savings and, therefore, does not assume any bill savings to the customer. Externalities are also not considered.

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[40] Discount rates assumed to be 3 percent for Societal, 10 percent for Participant, and an After-Tax Weighted Average Cost of Capital of 7.18 and 7.02 percent for KCP&L and KCP&L-GMO in all other tests.

[41] Provided by email communications with Joe O'Donnell, GPES, July 2012. Avoided capacity costs are based on the cost of new entry in the Midwest ISO.

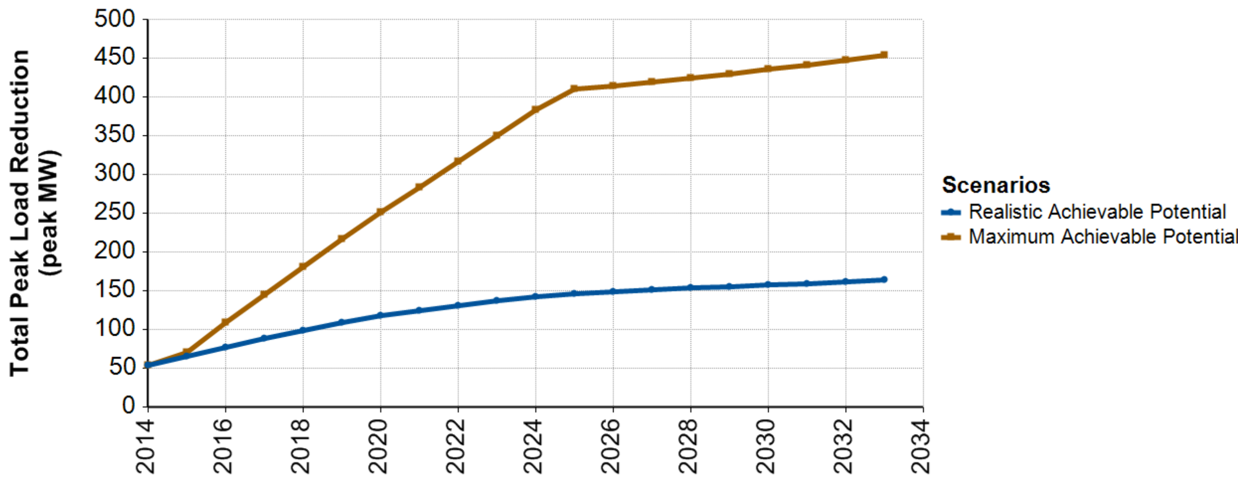
4 Findings

This section presents the results of Navigant's DR potential model for the Companies. This section also compares the Kansas- and Missouri-specific results from NADR with the peak demand reduction potential and cost effectiveness findings of this analysis, and discusses the likely drivers behind major differences in findings.

4.1 Peak Load Reduction Potential

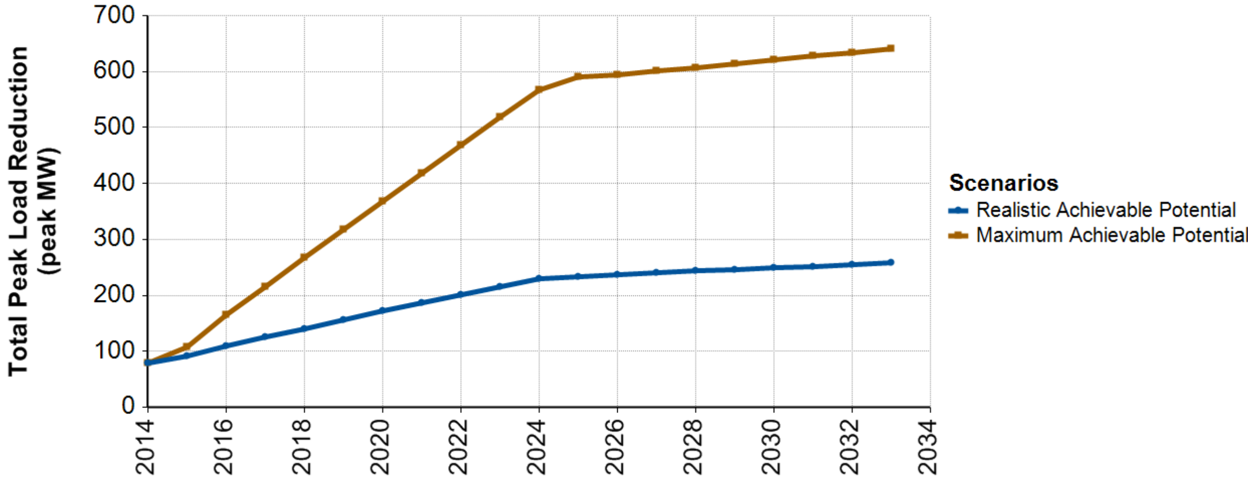
Navigant estimates up to 453 MW in peak load reduction potential for KCP&L-KS, 642 MW for KCP&L-MO, and 840 MW for KCP&L-GMO by 2033 in the Max Achievable scenario, which represents about 21.3, 28.2, and 31.0 percent of each utility's forecasted peak load for 2033, respectively. The potential in the Max Achievable scenario reflects the peak load reductions that *could* be possible if the Companies were to drive new DR customer participation through targeted program marketing and investment in new infrastructure deployment and integration. These findings are benchmarked against the Realistic Achievable findings in Figure 4-1 through Figure 4-3 and Table 4-1, which show the total peak load reduction potential estimated for KCP&L-KS, KCP&L-MO, and KCP&L-GMO in each scenario. Tabular results are shown in Appendix A and Appendix C.

Figure 4-1. Total Peak Load Reduction Potential by Scenario for KCP&L-KS (peak MW)



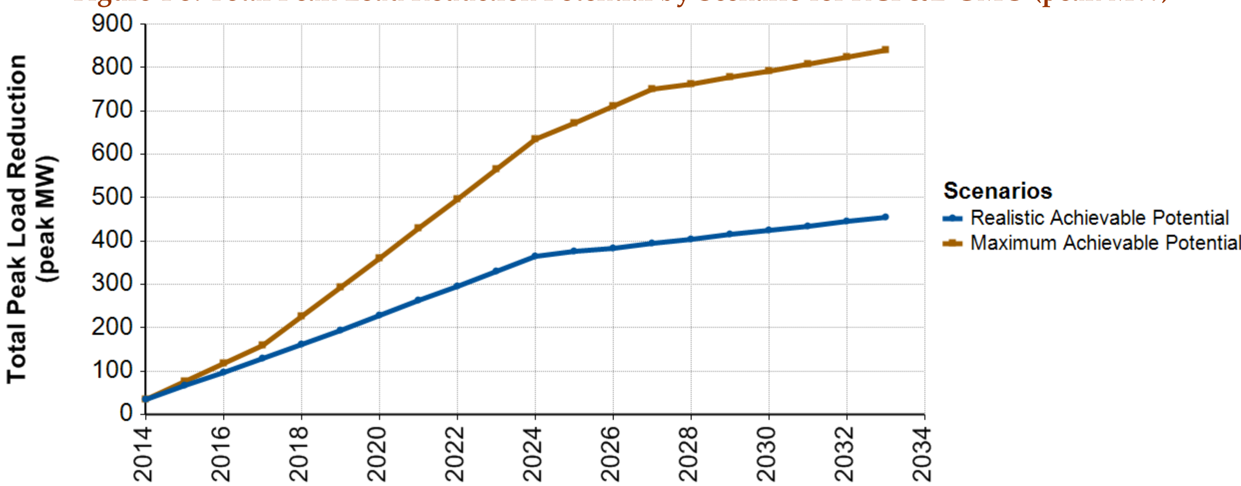
Source: Navigant analysis

Figure 4-2. Total Peak Load Reduction Potential by Scenario for KCP&L-MO (peak MW)



Source: Navigant analysis

Figure 4-3. Total Peak Load Reduction Potential by Scenario for KCP&L-GMO (peak MW)



Source: Navigant analysis

Table 4-1. Total Peak Load Reduction Potential by Scenario for the Companies (peak MW)

Utility	KCP&L-KS		KCP&L-MO		KCP&L-GMO	
Scenario	Realistic Achievable	Max Achievable	Realistic Achievable	Max Achievable	Realistic Achievable	Max Achievable
2014	54	54	78	78	36	36
2015	66	70	91	108	66	75
2016	77	109	110	164	98	117
2017	88	145	125	216	130	158
2018	99	181	141	267	162	226
2019	108	216	156	318	195	294
2020	117	251	172	368	229	361
2021	124	284	187	418	262	428
2022	130	317	201	468	296	497
2023	137	350	215	518	330	565
2024	143	383	230	568	365	636
2025	146	410	233	591	375	672
2026	148	413	237	594	384	710
2027	151	419	241	601	394	750
2028	153	424	243	607	404	760
2029	155	430	246	614	415	777
2030	157	436	249	621	425	792
2031	159	441	252	627	435	808
2032	161	447	255	634	445	824
2033	164	453	258	642	455	840

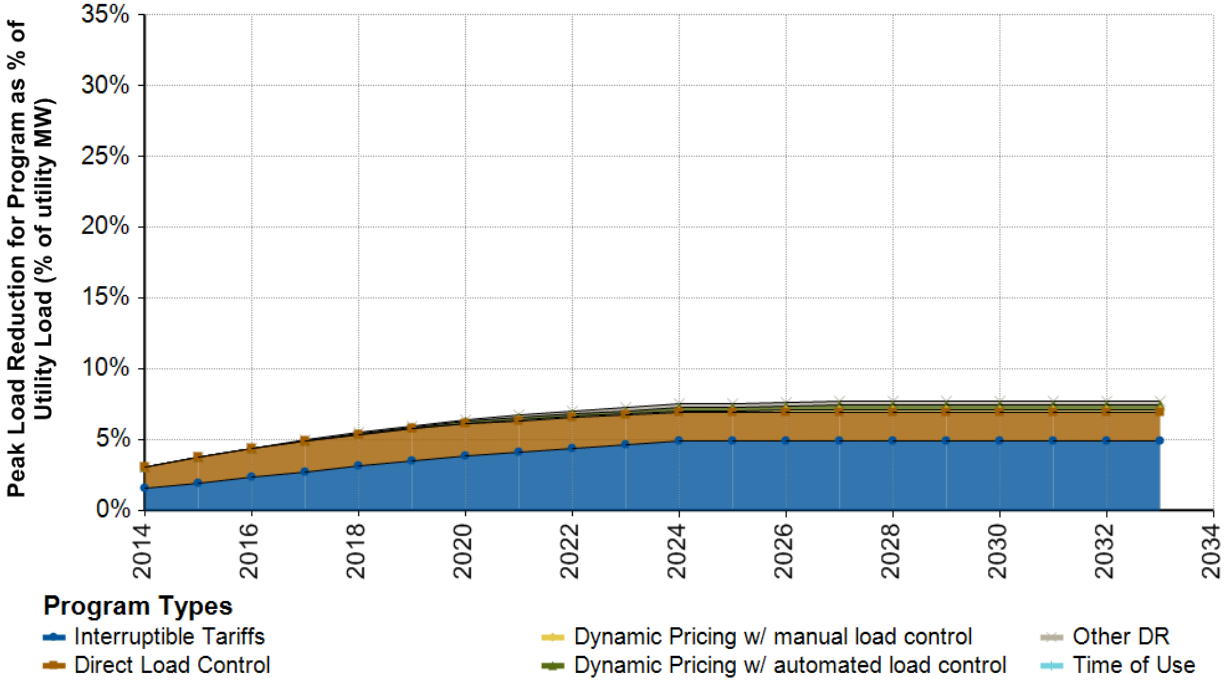
Source: Navigant analysis

For all of the Companies, these figures show significant contrast between the Realistic Achievable scenarios and the Max Achievable scenarios, and suggest that there is significant potential for additional demand reductions through strategic program deployment. Figure 4-4 through Figure 4-9 help identify *which* programs would be most beneficial to target, by showing the peak load reduction potential for each DR program type and scenario as an aggregate percentage of the utility's peak load. In general, KCP&L-KS has lower DR potential than the other utilities, which is primarily due to significantly lower peak load reduction from KCP&L-KS's Interruptible Tariffs program. This is based on current participation in KCP&L's MPower program, where the average peak load reduction for customers in KCP&L-KS is about a third of the average customer's reduction in KCP&L GMO.[42] This also aligns with FERC's assumption that the average Industrial Tariff participant's peak demand reduction in KS (i.e., around 30 percent per participant, on average) is less than a third of the peak demand reduction in MO (i.e., over 90 percent per participant, on average). Additionally, the percentage of peak load from the

[42] Average peak load reductions (i.e., average % load reduced per participant) estimated for 2012 MPower program are around 31 percent in KCP&L-KS, 39 percent in KCP&L-MO, and 92 percent in KCP&L-GMO. Based on 2012 MPower data provided by Joe O'Donnell, GPES, "2012 MPower Active Contracts_12-09-12.xlsx", December 2012.

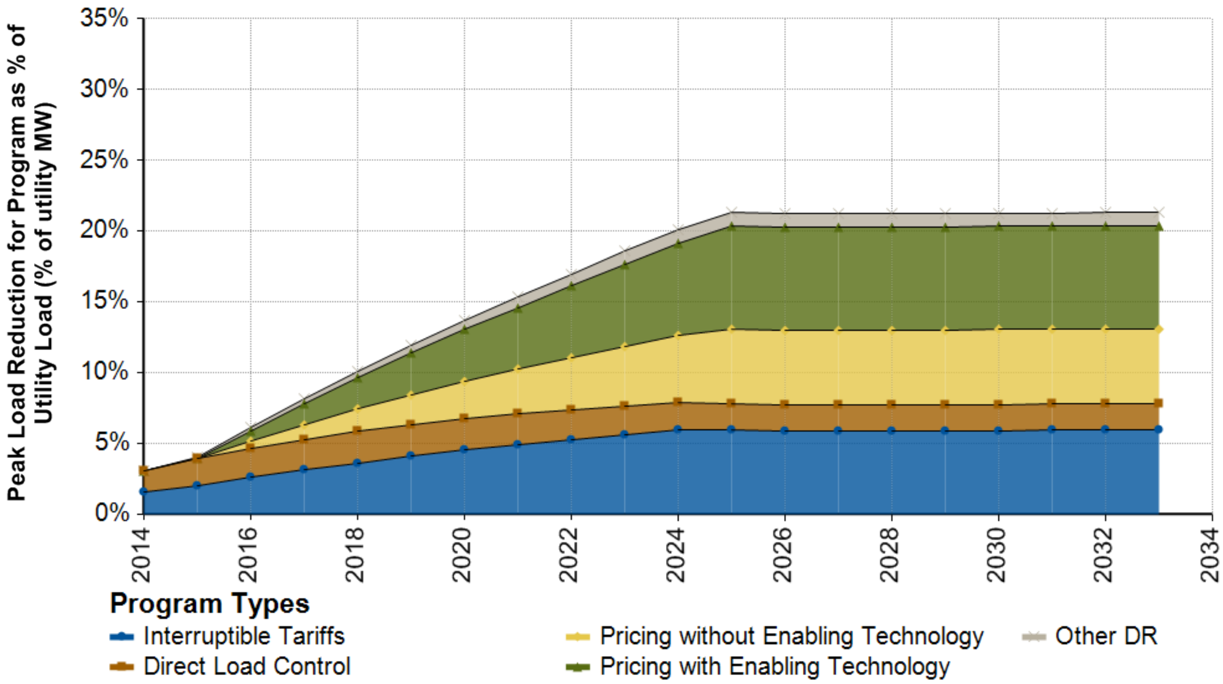
Large C&I customer class is lower in KCP&L-KS relative to the other utilities, which further contributes to the decreased impacts from Interruptible Tariffs.

Figure 4-4. KCP&L-KS Peak Load Reduction Potential – Realistic Achievable (% of utility MW)



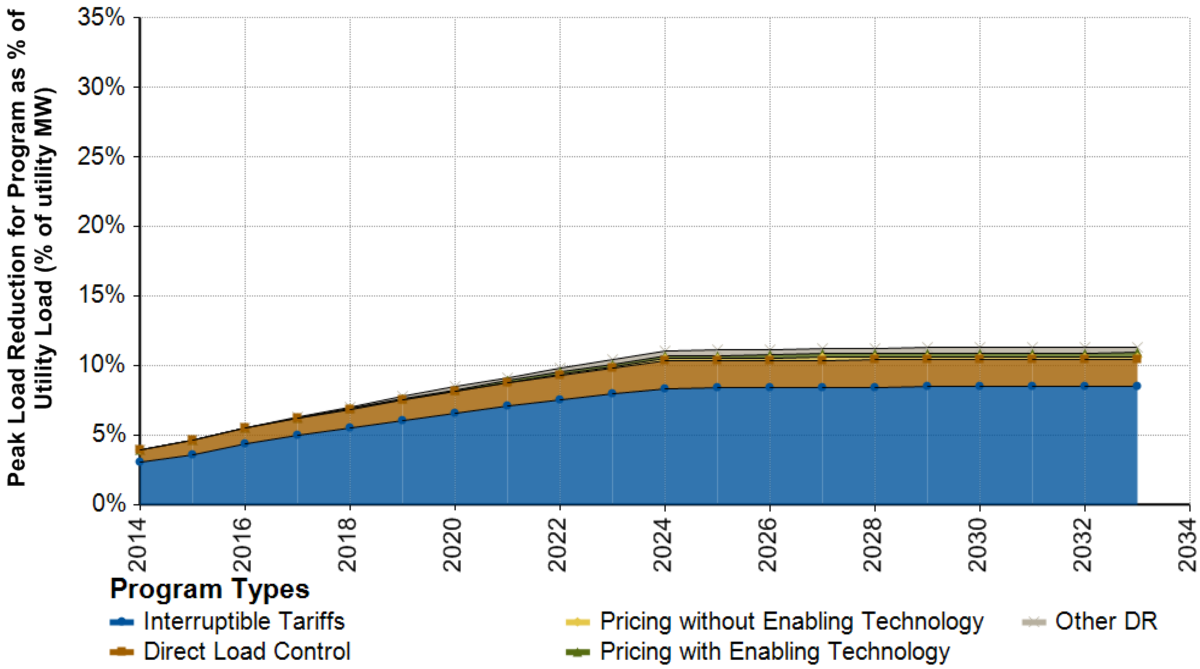
Source: Navigant analysis

Figure 4-5. KCP&L-KS Peak Load Reduction Potential – Max Achievable Scenario (% of utility MW)



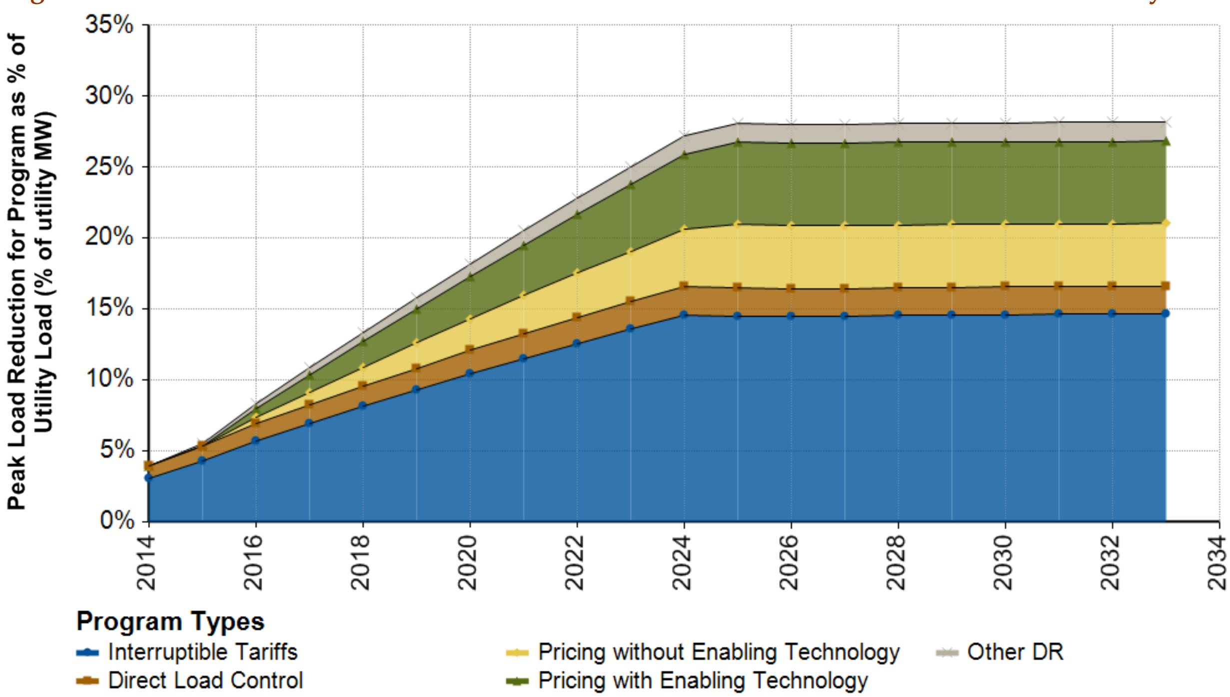
Source: Navigant analysis

Figure 4-6. KCP&L-MO Peak Load Reduction Potential – Realistic Achievable (% of utility MW)



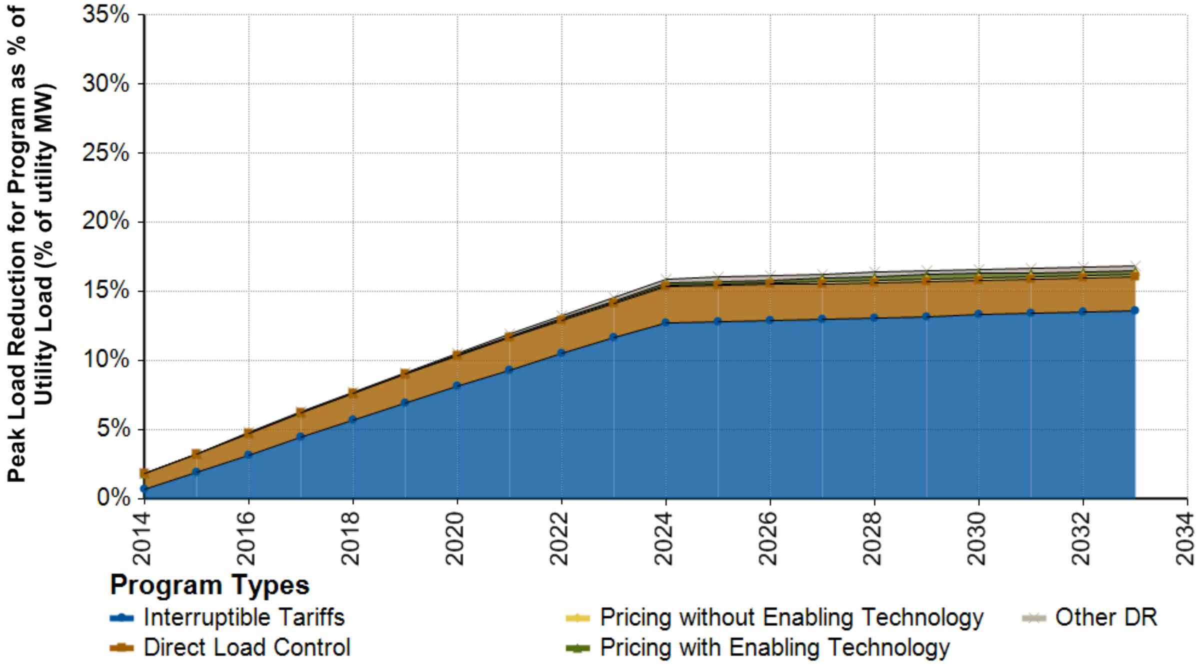
Source: Navigant analysis

Figure 4-7. KCP&L-MO Peak Load Reduction Potential – Max Achievable Scenario (% of utility MW)



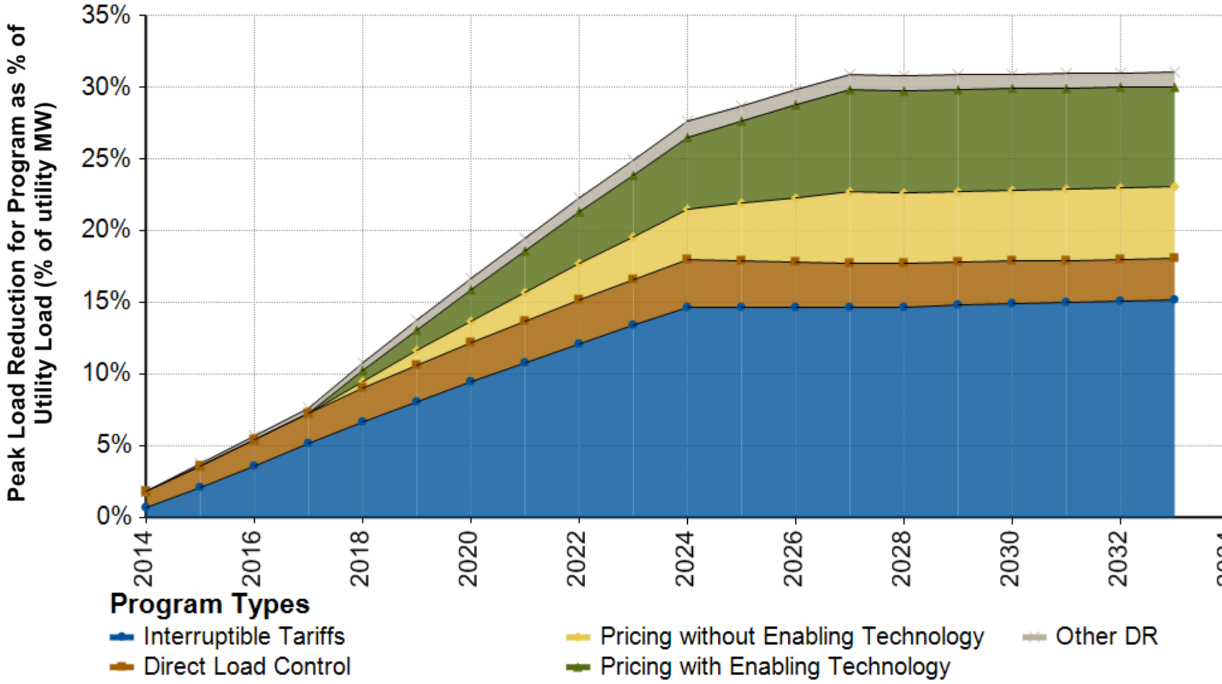
Source: Navigant analysis

Figure 4-8. KCP&L-GMO Peak Load Reduction Potential – Realistic Achievable (% of utility MW)



Source: Navigant analysis

Figure 4-9. KCP&L-GMO Peak Load Reduction Potential – Max Achievable Scenario (% utility MW)



Source: Navigant analysis

4.2 Energy Savings from Demand Response Potential

As discussed in Section 3.6, Navigant conservatively assumes there are no significant energy savings from the Companies' DR programs in any scenario.

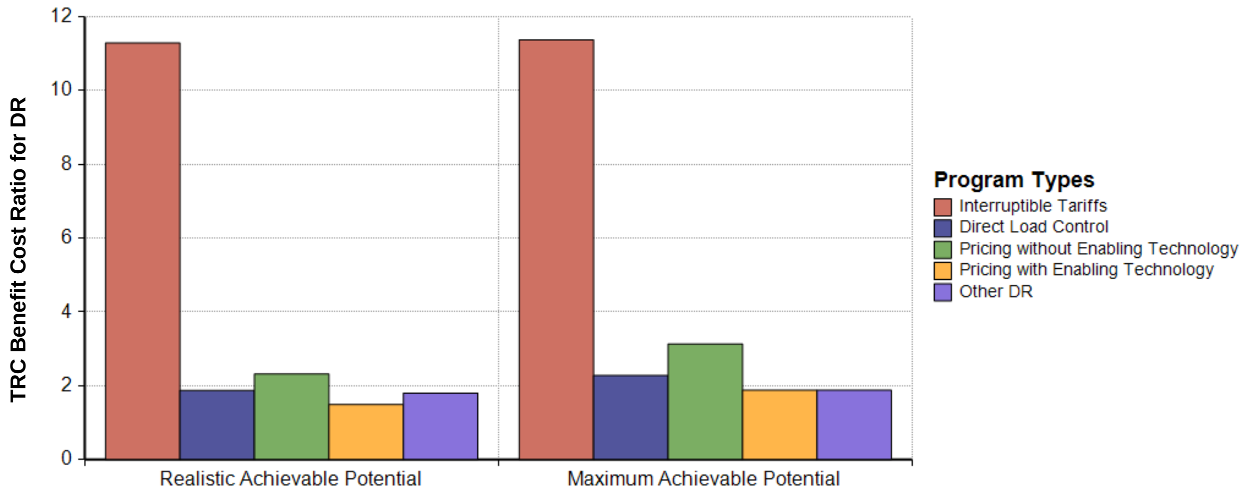
4.3 Cost-Effectiveness

This analysis finds almost all DR program types to be cost effective for both scenarios using the Total Resource Cost (TRC), Societal cost, Utility Cost, and Rate Impact Measure benefit-cost tests, as defined in the MO Planning Regulations.[43] The only exception is the Other DR program, where the Utility and RIM test ratios are very close to one. These results represent more cost categories and a more complex methodology than the cost effectiveness analyses in FERC's DR potential study and the Missouri DSM potential study. As such, the benefit-cost ratios in this study are lower, but are likely a better portrayal of actual cost effectiveness.

Figure 4-10 through Figure 4-12 show the results for the TRC test, with all results provided in tabular format in Appendix B – Benefit-Cost Test Ratio Results. As shown in the results, the benefit-cost ratios for the Pricing without Enabling Technology are relatively high, which can be attributed to the lack of equipment and incentive costs needed to participate. However, the potential impacts from this program are also more limited, since participants do not have access to an enabling technology. Similarly, a Direct Load Control program is likely to be more cost effective than Pricing with Enabling Technology, but customer participation rates may ultimately be higher for the Pricing program. Note that incentives are treated as a transfer in the TRC test, which results in a high benefit-cost test ratio for programs where the primary costs are incentives, like the Interruptible Tariffs program.

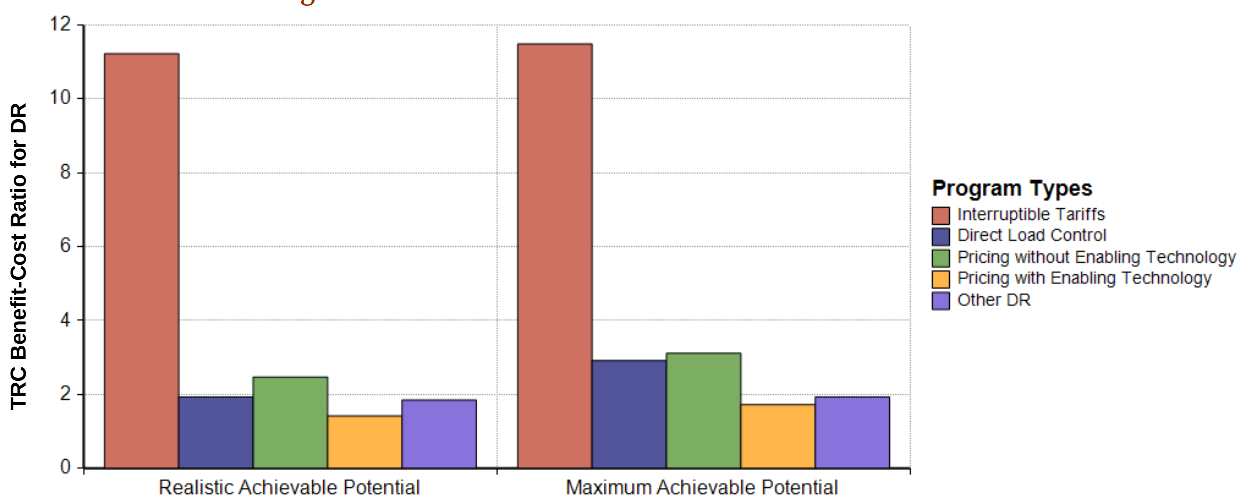
[43] Rules of Department of Economic Development Division 240—Public Service Commission Chapter 22—Electric Utility Resource Planning (4 CSR 240-22.010) – http://sos.mo.gov/adrules/csr/current/4csr/4c240-22.pdf

Figure 4-10. TRC Benefit-Cost Test Results – KCP&L-KS



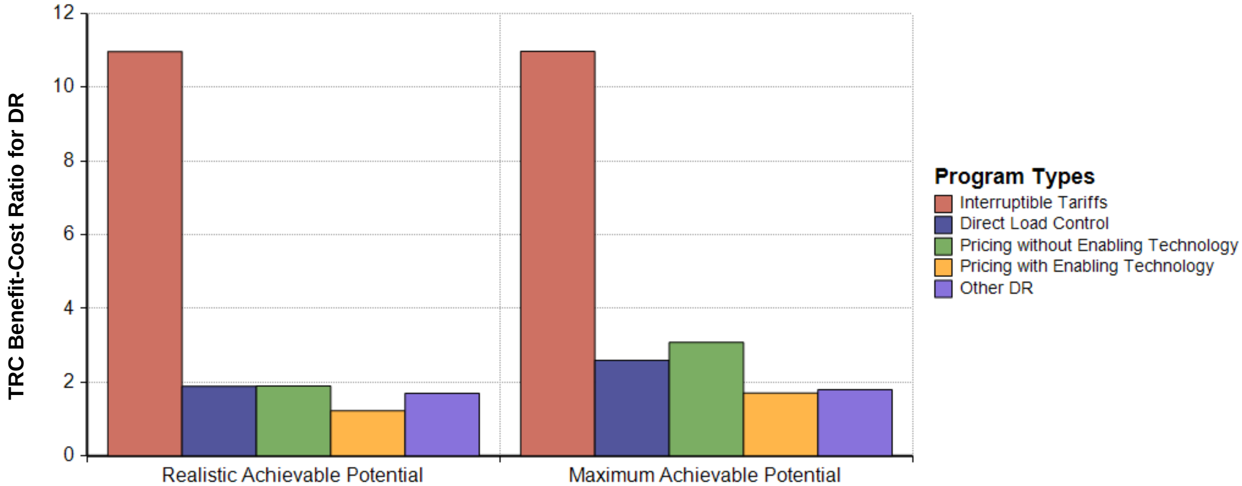
Source: Navigant analysis

Figure 4-11. TRC Benefit-Cost Test Results – KCP&L-MO



Source: Navigant analysis

Figure 4-12. TRC Benefit-Cost Test Results – KCP&L-GMO



Source: Navigant analysis

4.4 *Comparison with Findings in FERC's NADR Model*

Table 4-2 compares the "Achievable Penetration" scenario findings for Kansas and Missouri from FERC's NADR model with the Maximum Achievable scenario potential estimated in this analysis. The model outputs for 2019 are used to be consistent with the final year of the FERC analysis.

Table 4-2. Comparison of the Companies' Potential Peak Load Reduction from DR in 2019 (% of utility MW)

	KCP&L-KS	KCP&L-MO	KCP&L-GMO
Navigant's Maximum Achievable Scenario	11.9%	15.7%	13.7%
FERC's Achievable Potential Scenario	14.3%*	12.6%**	12.6%**

* For the state of Kansas
** For the state of Missouri

4.5 *Summary*

All of the scenarios show that significant potential growth still exists for the Companies' MPower Interruptible/Curtailable Tariff programs targeting the Medium and Large C&I customer segments, particularly in the KCP&L-MO and GMO territories. In contrast, participation rates in the Companies' Energy Optimizer Direct Load Control programs are already close to "best practice," though some additional potential exists. While the Other DR program may be cost effective, the potential peak reductions are estimated to be relatively small.

For all utilities in the Max Achievable scenario, the most substantial reductions in 2033 are projected to occur through the Companies' existing MPower programs and pricing with enabling technology. However, in the Realistic Achievable scenario, pricing programs contribute minimal peak load reduction. The Max Achievable impacts from pricing programs are significantly higher than the Realistic

Achievable impacts, which is due to the assumption that the pricing programs are opt-in in the Realistic scenario and opt-out in the Max Achievable scenario. As assumed in FERC's NADR, the pricing program impacts shown in the Max Achievable scenario assumes that the Companies enroll 60 to 75 percent of customers in a pricing program, while the Realistic scenario only assumes that the Companies enroll 5 percent. Even without an opt-out tariff, Navigant expects that a 5 percent enrollment is conservative and impacts under realistic implementation conditions could be higher.

- **Deployment of pricing programs is predicated on the backend integration of the Companies' AMI systems. While the Companies plan to deploy AMI across most of their service territories before 2020, the Companies do not have explicit plans to invest in the backend integration required to support time-based rates, such as installation of a MDMS, which can add significant upfront costs to the program's deployment.**

- **As discussed in Section 3.7, the analysis includes the estimated costs of installing a MDMS as a one-time startup cost for the pricing programs and finds that the pricing programs are cost effective when analyzed over a long-term horizon (i.e., the 20-year analysis period). However, we note that with relatively low near-term avoided capacity costs projected for the Companies, there is a significant time lag (10-15 years) before the cumulative program benefits surpass the cumulative program costs.**

- **This suggests that the timing of deployment for the pricing programs may warrant monitoring of capacity price forecasts and possibly aligning deployment with capacity price increases (which could shorten the effective payback time).**

Overall, this analysis finds significant potential for cost-effective DR program growth, with as much as 21-31 percent of each utility's peak demand in 2033 met by DR, as compared to less than 5 percent met by the Companies' existing programs. Furthermore, Navigant's cost-effectiveness analysis found that all of the program types are likely to be cost-effective over a 20-year horizon using the Total Resource Cost (TRC) benefit-cost test as a screen for all three of the utilities. Navigant also found that almost all program types are cost-effective in the long-term under the Societal, Utility Cost, and Rate Impact Measure benefit-cost tests. These results reflect the estimated benefits from the continued promotion of the Companies' existing MPower and Optimizer programs, as well as investing in the infrastructure needed for backend integration of the Companies' AMI systems to support time-based rate programs.

5 Appendix A – Cumulative Potential Savings and Budget Results

Table 5-1. Cumulative Potential Savings and Budget for KCP&L-KS

	Realistic Achievable Potential			Maximum Achievable Potential		
	Cumulative Energy Savings Potential	Cumulative Peak Demand Savings Potential	Cumulative Budget	Cumulative Energy Savings Potential	Cumulative Peak Demand Savings Potential	Cumulative Budget
Year	(MWh)	(MW)	($)	(MWh)	(MW)	($)
2014	0	54	$5,672,052	0	54	$5,785,509
2015	0	66	$12,082,050	0	70	$13,382,649
2016	0	77	$17,988,131	0	109	$25,630,670
2017	0	88	$24,891,860	0	145	$37,944,138
2018	0	99	$31,758,078	0	181	$52,231,206
2019	0	108	$39,017,432	0	216	$68,763,745
2020	0	117	$46,643,152	0	251	$87,618,847
2021	0	124	$54,165,962	0	284	$108,793,029
2022	0	130	$62,371,338	0	317	$132,384,029
2023	0	137	$71,259,800	0	350	$158,578,709
2024	0	143	$80,841,373	0	383	$187,496,317
2025	0	146	$91,488,360	0	410	$218,590,543
2026	0	148	$102,546,428	0	413	$244,760,685
2027	0	151	$114,077,010	0	419	$272,123,834
2028	0	153	$125,698,721	0	424	$300,534,804
2029	0	155	$137,749,161	0	430	$330,004,403
2030	0	157	$150,261,042	0	436	$360,605,725
2031	0	159	$163,250,254	0	441	$392,361,269
2032	0	161	$176,730,718	0	447	$425,347,967
2033	0	164	$190,740,954	0	453	$459,632,639

Note: Conservatively assumes there are no significant energy savings from the Companies' DR programs, which is consistent with typical industry assumptions for dispatchable programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU. Results represent both net and gross impacts. Costs are inclusive of incentives, program admin, and EM&V.
Source: Navigant analysis

Table 5-2. Cumulative Potential Savings and Budget for KCP&L-MO

Year	Realistic Achievable Potential			Maximum Achievable Potential		
	Cumulative Energy Savings Potential (MWh)	Cumulative Peak Demand Savings Potential (MW)	Cumulative Budget ($)	Cumulative Energy Savings Potential (MWh)	Cumulative Peak Demand Savings Potential (MW)	Cumulative Budget ($)
2014	0	78	$4,114,225	0	78	$4,330,698
2015	0	91	$10,541,321	0	108	$12,769,124
2016	0	110	$17,915,406	0	164	$28,534,152
2017	0	125	$26,858,809	0	216	$46,143,182
2018	0	141	$36,575,376	0	267	$66,843,462
2019	0	156	$47,494,740	0	318	$90,769,524
2020	0	172	$59,647,161	0	368	$118,104,732
2021	0	187	$73,069,301	0	418	$149,048,455
2022	0	201	$87,790,210	0	468	$183,745,477
2023	0	215	$103,860,589	0	518	$222,388,189
2024	0	230	$121,317,514	0	568	$265,160,472
2025	0	233	$138,103,840	0	591	$310,209,754
2026	0	237	$155,555,730	0	594	$350,429,108
2027	0	241	$173,709,466	0	601	$392,293,951
2028	0	243	$192,172,113	0	607	$435,657,944
2029	0	246	$211,325,815	0	614	$480,622,055
2030	0	249	$231,196,651	0	621	$527,249,167
2031	0	252	$251,804,672	0	627	$575,563,789
2032	0	255	$273,152,757	0	634	$625,609,219
2033	0	258	$295,311,650	0	642	$677,540,222

Note: Conservatively assumes there are no significant energy savings from the Companies' DR programs, which is consistent with typical industry assumptions for dispatchable programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU. Results represent both net and gross impacts. Costs are inclusive of incentives, program admin, and EM&V.
Source: Navigant analysis

Table 5-3. Cumulative Potential Savings and Budget for KCP&L-GMO

	Realistic Achievable Potential			Maximum Achievable Potential		
	Cumulative Energy Savings Potential	Cumulative Peak Demand Savings Potential	Cumulative Budget	Cumulative Energy Savings Potential	Cumulative Peak Demand Savings Potential	Cumulative Budget
Year	(MWh)	(MW)	($)	(MWh)	(MW)	($)
2014	0	36	$2,976,743	0	36	$3,018,282
2015	0	66	$9,653,744	0	75	$10,316,604
2016	0	98	$17,403,516	0	117	$19,845,843
2017	0	130	$26,983,893	0	158	$33,331,438
2018	0	162	$38,716,017	0	226	$55,692,474
2019	0	195	$54,126,156	0	294	$80,986,346
2020	0	229	$70,944,741	0	361	$110,572,407
2021	0	262	$90,015,937	0	428	$144,515,297
2022	0	296	$111,994,080	0	497	$183,546,257
2023	0	330	$137,001,267	0	565	$227,885,121
2024	0	365	$165,291,988	0	636	$277,946,214
2025	0	375	$193,732,844	0	672	$331,347,851
2026	0	384	$223,532,953	0	710	$388,374,633
2027	0	394	$254,850,429	0	750	$449,342,965
2028	0	404	$287,733,003	0	760	$504,198,063
2029	0	415	$322,345,390	0	777	$561,918,720
2030	0	425	$358,153,771	0	792	$622,241,989
2031	0	435	$395,700,274	0	808	$685,284,466
2032	0	445	$435,119,322	0	824	$751,222,486
2033	0	455	$476,418,473	0	840	$820,131,160

Note: Conservatively assumes there are no significant energy savings from the Companies' DR programs, which is consistent with typical industry assumptions for dispatchable programs, as well as some of Navigant's recent findings for utilities with time-based rates, including TOU. Results represent both net and gross impacts. Costs are inclusive of incentives, program admin, and EM&V.
Source: Navigant analysis.

6 Appendix B – Benefit-Cost Test Ratio Results

The benefit-cost test ratio results are shown below for all DR program types and both scenarios using the Total Resource Cost (TRC), Societal cost, Utility Cost, and Rate Impact Measure benefit-cost tests, as defined in the MO Planning Regulations. Note that incentives are treated as a transfer in the TRC test, which results in a high benefit-cost test ratio for programs where the primary costs are incentives, like the Interruptible Tariffs program.

Table 6-1. Benefit-Cost Test Ratio Results for All Program Types and Scenarios

State	Utility	Benefit-Cost Test	Program Type	Realistic Scenario	Maximum Scenario
KS	KCP&L	Societal Cost Test	Interruptible Tariffs	11.6	11.6
			Direct Load Control	2.1	2.6
			Pricing without Enabling Technology	2.6	3.2
			Pricing with Enabling Technology	1.7	2.0
			Other DR	1.9	2.0
		Total Resource Cost Test	Interruptible Tariffs	11.3	11.4
			Direct Load Control	1.9	2.3
			Pricing without Enabling Technology	2.3	3.1
			Pricing with Enabling Technology	1.5	1.9
			Other DR	1.8	1.9
		Utility Cost Test	Interruptible Tariffs	2.3	2.3
			Direct Load Control	1.9	2.3
			Pricing without Enabling Technology	2.3	3.1
			Pricing with Enabling Technology	1.5	1.9
			Other DR	1.0	1.1
		Participant Cost Test	Interruptible Tariffs	-	-
			Direct Load Control	-	-
			Pricing without Enabling Technology	-	-
			Pricing with Enabling Technology	-	-
			Other DR	-	-
		Rate Impact Measure Test	Interruptible Tariffs	2.3	2.3
			Direct Load Control	1.9	2.3
			Pricing without Enabling Technology	2.3	3.1
			Pricing with Enabling Technology	1.5	1.9
			Other DR	1.0	1.1
MO	KCP&L	Societal Cost Test	Interruptible Tariffs	11.6	11.7
			Direct Load Control	2.1	3.1
			Pricing without Enabling Technology	2.7	3.2
			Pricing with Enabling Technology	1.6	1.9
			Other DR	1.9	2.0
		Total Resource	Interruptible Tariffs	11.2	11.5
			Direct Load Control	1.9	2.9

State	Utility	Benefit-Cost Test	Program Type	Realistic Scenario	Maximum Scenario
		Cost Test	Pricing without Enabling Technology	2.5	3.1
			Pricing with Enabling Technology	1.4	1.7
			Other DR	1.8	1.9
		Utility Cost Test	Interruptible Tariffs	2.2	2.3
			Direct Load Control	1.9	2.9
			Pricing without Enabling Technology	2.5	3.1
			Pricing with Enabling Technology	1.4	1.7
			Other DR	1.1	1.1
		Participant Cost Test	Interruptible Tariffs	-	-
			Direct Load Control	-	-
			Pricing without Enabling Technology	-	-
			Pricing with Enabling Technology	-	-
			Other DR	-	-
		Rate Impact Measure Test	Interruptible Tariffs	2.2	2.3
			Direct Load Control	1.9	2.9
			Pricing without Enabling Technology	2.5	3.1
			Pricing with Enabling Technology	1.4	1.7
			Other DR	1.1	1.1
MO	KCP&L GMO	Societal Cost Test	Interruptible Tariffs	11.1	11.1
			Direct Load Control	2.1	2.9
			Pricing without Enabling Technology	2.2	3.2
			Pricing with Enabling Technology	1.4	1.9
			Other DR	1.8	1.9
		Total Resource Cost Test	Interruptible Tariffs	11.0	11.0
			Direct Load Control	1.9	2.6
			Pricing without Enabling Technology	1.9	3.1
			Pricing with Enabling Technology	1.2	1.7
			Other DR	1.7	1.8
		Utility Cost Test	Interruptible Tariffs	2.2	2.2
			Direct Load Control	1.9	2.6
			Pricing without Enabling Technology	1.9	3.1
			Pricing with Enabling Technology	1.2	1.7
			Other DR	1.0	1.0
		Participant Cost Test	Interruptible Tariffs	-	-
			Direct Load Control	-	-
			Pricing without Enabling Technology	-	-
			Pricing with Enabling Technology	-	-
			Other DR	-	-
		Rate Impact Measure Test	Interruptible Tariffs	2.2	2.2
			Direct Load Control	1.9	2.6
			Pricing without Enabling Technology	1.9	3.1
			Pricing with Enabling Technology	1.2	1.7

State	Utility	Benefit-Cost Test	Program Type	Realistic Scenario	Maximum Scenario
			Other DR	1.0	1.0

Note: The Participant Cost Test is undefined because no costs are assumed on the part of participants.
Source: Navigant analysis

7 Appendix C – DR Demand Savings and Costs by Program Type

The following tables show the demand savings for each DR program type in MW and as a percent of each utility's annual peak demand, as well as the cumulative costs for each program type.

Table 7-1. Peak Load Reduction Potential for the Companies – Realistic Scenario (peak MW)

Utility	KCP&L-KS						KCP&L-MO						KCP&L-GMO					
Prog Type	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total
2014	26.6	27.0	0.0	0.0	0.0	**53.6**	60.0	18.0	0.0	0.0	0.0	**78.0**	13.6	22.0	0.0	0.0	0.0	**35.6**
2015	33.4	32.3	0.0	0.0	0.0	**65.7**	71.0	20.3	0.0	0.0	0.0	**91.2**	37.7	27.9	0.0	0.0	0.0	**65.7**
2016	41.2	35.6	0.0	0.0	0.5	**77.4**	86.7	22.5	0.0	0.0	0.8	**110.0**	64.3	32.6	0.0	0.0	0.7	**97.5**
2017	48.8	38.2	0.0	0.0	1.1	**88.0**	98.7	24.7	0.0	0.0	1.6	**124.9**	91.4	36.9	0.0	0.0	1.3	**129.6**
2018	56.1	40.1	0.4	0.6	1.6	**98.8**	110.5	27.0	0.4	0.6	2.3	**140.8**	119.1	41.0	0.0	0.0	2.0	**162.1**
2019	63.0	41.4	0.7	1.2	2.1	**108.5**	122.0	29.3	0.8	1.1	3.1	**156.4**	147.3	44.9	0.0	0.0	2.7	**194.8**
2020	69.8	42.1	1.1	1.7	2.7	**117.4**	133.1	31.6	1.3	1.7	3.9	**171.5**	175.6	48.4	0.4	0.7	3.4	**228.5**
2021	76.0	41.0	1.5	2.3	3.2	**124.1**	143.9	33.9	1.7	2.3	4.7	**186.5**	204.5	51.1	0.8	1.4	4.1	**261.9**
2022	81.9	40.0	1.9	3.0	3.7	**130.5**	154.3	36.3	2.1	2.8	5.5	**201.1**	234.0	53.9	1.2	2.1	4.8	**296.1**
2023	87.6	39.1	2.3	3.6	4.3	**136.8**	164.5	38.7	2.5	3.4	6.4	**215.5**	263.2	56.9	1.7	2.8	5.5	**330.0**
2024	92.8	38.3	2.6	4.2	4.8	**142.7**	174.3	41.2	2.9	4.0	7.2	**229.6**	293.6	60.0	2.1	3.5	6.3	**365.4**
2025	93.8	38.7	3.1	4.9	5.3	**145.8**	176.0	41.4	3.4	4.6	8.0	**233.4**	300.7	60.7	2.5	4.2	7.0	**375.1**
2026	94.9	39.2	3.5	5.5	5.4	**148.5**	178.0	41.7	3.8	5.2	8.2	**236.9**	307.3	61.5	2.9	5.0	7.2	**383.9**
2027	96.1	39.6	3.9	6.2	5.5	**151.4**	180.2	42.0	4.3	5.8	8.3	**240.6**	315.1	62.3	3.4	5.8	7.3	**393.9**
2028	97.4	40.2	4.0	6.3	5.6	**153.4**	182.4	42.2	4.3	5.9	8.5	**243.3**	322.9	63.1	3.9	6.6	7.5	**404.0**
2029	98.6	40.7	4.0	6.4	5.7	**155.3**	184.8	42.5	4.4	5.9	8.6	**246.2**	331.8	63.9	4.4	7.4	7.6	**415.3**
2030	99.9	41.2	4.1	6.5	5.8	**157.4**	187.1	42.8	4.4	6.0	8.8	**249.1**	340.4	64.7	4.5	7.6	7.8	**425.0**
2031	101.3	41.6	4.1	6.5	5.9	**159.5**	189.4	43.1	4.5	6.0	9.0	**252.0**	348.9	65.5	4.6	7.7	7.9	**434.7**
2032	102.5	42.2	4.2	6.6	6.0	**161.5**	191.5	43.4	4.5	6.1	9.2	**254.7**	358.2	66.3	4.7	7.8	8.1	**445.1**
2033	104.0	42.8	4.2	6.7	6.1	**163.8**	193.9	43.8	4.6	6.2	9.4	**257.8**	366.7	67.2	4.8	7.9	8.3	**454.9**

IT = Interruptible Tariffs, DLC = Direct Load Control, Pricing w/o ET = Pricing without Enabling Technology, Pricing w/ ET = Pricing with Enabling Technology
Source: Navigant analysis

Table 7-2. Peak Load Reduction Potential for the Companies – Maximum Scenario (peak MW)

Utility	KCP&L-KS						KCP&L-MO						KCP&L-GMO					
Prog Type	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total
2014	26.6	27.0	0.0	0.0	0.0	**53.6**	60.0	18.0	0.0	0.0	0.0	**78.0**	13.6	22.0	0.0	0.0	0.0	**35.6**
2015	35.7	32.6	0.0	0.0	2.1	**70.4**	84.1	20.9	0.0	0.0	3.3	**108.4**	42.4	30.1	0.0	0.0	2.9	**75.4**
2016	45.9	36.2	9.4	12.9	4.2	**108.6**	113.2	23.9	8.9	11.9	6.5	**164.4**	73.8	37.0	0.0	0.0	5.7	**116.6**
2017	55.5	38.4	18.9	26.0	6.2	**145.0**	137.9	26.4	17.9	23.8	9.7	**215.7**	106.0	43.6	0.0	0.0	8.6	**158.1**
2018	64.9	40.0	28.5	39.3	8.2	**180.9**	162.6	28.9	26.9	35.8	12.6	**266.8**	139.0	50.1	10.6	15.3	11.4	**226.4**
2019	73.8	40.8	38.4	52.9	10.1	**216.0**	187.0	31.3	36.1	47.9	15.6	**317.8**	171.7	55.3	21.5	31.0	14.1	**293.6**
2020	82.6	41.1	48.4	66.8	11.9	**250.8**	210.8	33.6	45.3	60.0	18.4	**368.1**	204.3	60.2	32.7	47.1	16.6	**361.0**
2021	90.7	39.7	58.7	80.9	13.7	**283.7**	234.5	35.9	54.7	72.3	21.0	**418.4**	237.4	64.2	44.2	63.6	19.1	**428.5**
2022	98.5	38.4	69.1	95.2	15.3	**316.6**	257.6	38.2	64.2	84.8	23.5	**468.3**	270.9	68.1	56.1	80.5	21.4	**497.0**
2023	106.1	37.3	79.7	110.0	16.9	**350.0**	280.5	40.4	73.8	97.4	25.9	**518.1**	303.7	72.0	68.2	97.8	23.5	**565.3**
2024	113.1	36.3	90.6	125.0	18.4	**383.5**	303.1	42.7	83.5	110.3	28.2	**567.8**	337.7	76.0	80.8	115.7	25.6	**635.7**
2025	113.7	36.1	101.8	140.4	18.1	**410.1**	304.4	42.1	93.5	123.3	27.6	**590.9**	343.8	75.5	93.8	134.1	25.0	**672.2**
2026	114.4	35.8	102.9	142.1	18.2	**413.5**	306.2	41.7	94.3	124.3	27.8	**594.2**	349.3	75.0	107.2	153.0	25.1	**709.6**
2027	115.9	36.3	104.2	143.8	18.5	**418.6**	310.1	42.0	95.1	125.3	28.2	**600.6**	356.0	74.6	121.2	172.6	25.3	**749.7**
2028	117.6	36.8	105.6	145.7	18.8	**424.4**	314.0	42.2	96.0	126.3	28.5	**607.0**	362.6	74.1	123.3	175.3	25.3	**760.5**
2029	119.1	37.2	106.9	147.6	19.0	**429.8**	318.1	42.5	96.8	127.4	29.0	**613.8**	372.5	75.0	125.5	178.1	25.6	**776.6**
2030	120.9	37.7	108.2	149.4	19.3	**435.6**	322.2	42.8	97.7	128.5	29.5	**620.7**	382.0	75.8	127.6	180.8	25.9	**792.0**
2031	122.6	38.1	109.6	151.3	19.5	**441.1**	326.4	43.1	98.6	129.6	29.8	**627.5**	391.5	76.6	129.9	183.6	26.1	**807.6**
2032	124.3	38.6	111.1	153.4	19.8	**447.1**	330.0	43.4	99.6	130.8	30.2	**634.0**	401.7	77.5	132.2	186.4	26.3	**824.1**
2033	126.1	39.1	112.6	155.5	20.1	**453.5**	334.4	43.8	100.6	132.1	30.8	**641.6**	411.3	78.4	134.4	189.3	26.6	**840.0**

IT = Interruptible Tariffs, DLC = Direct Load Control, Pricing w/o ET = Pricing without Enabling Technology, Pricing w/ ET = Pricing with Enabling Technology
Source: Navigant analysis

The following tables show the demand savings for each DR program type and in total as a percent of each utility's annual peak demand. These results are also shown graphically in Figure 1-4 through Figure 1-6 and Figure 4-4 through Figure 4-9.

Table 7-3. Peak Load Reduction Potential for the Companies – Realistic Scenario (% of utility MW)

Utility	KCP&L-KS						KCP&L-MO						KCP&L-GMO					
Prog Type	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total
2014	1.53%	1.55%	0%	0%	0%	**3.08%**	3.04%	0.91%	0%	0%	0%	**3.95%**	0.68%	1.10%	0%	0%	0%	**1.79%**
2015	1.90%	1.84%	0%	0%	0%	**3.74%**	3.59%	1.02%	0%	0%	0%	**4.61%**	1.87%	1.38%	0%	0%	0%	**3.25%**
2016	2.33%	2.01%	0%	0%	0.03%	**4.37%**	4.37%	1.13%	0%	0%	0.04%	**5.54%**	3.14%	1.59%	0%	0%	0.03%	**4.77%**
2017	2.73%	2.14%	0%	0%	0.06%	**4.93%**	4.95%	1.24%	0%	0%	0.08%	**6.27%**	4.41%	1.78%	0%	0%	0.06%	**6.25%**
2018	3.12%	2.23%	0%	0%	0.09%	**5.49%**	5.51%	1.35%	0%	0%	0.12%	**7.02%**	5.66%	1.95%	0%	0%	0.10%	**7.70%**
2019	3.47%	2.28%	0%	0%	0.12%	**5.97%**	6.04%	1.45%	0%	0%	0.16%	**7.75%**	6.89%	2.10%	0%	0%	0.13%	**9.11%**
2020	3.80%	2.29%	0.06%	0.10%	0.15%	**6.40%**	6.56%	1.56%	0.06%	0.08%	0.19%	**8.45%**	8.10%	2.23%	0.02%	0.03%	0.16%	**10.54%**
2021	4.11%	2.22%	0.08%	0.13%	0.17%	**6.70%**	7.05%	1.66%	0.08%	0.11%	0.23%	**9.13%**	9.29%	2.32%	0.04%	0.06%	0.19%	**11.89%**
2022	4.39%	2.14%	0.10%	0.16%	0.20%	**6.99%**	7.50%	1.77%	0.10%	0.14%	0.27%	**9.78%**	10.47%	2.41%	0.06%	0.09%	0.22%	**13.24%**
2023	4.64%	2.07%	0.12%	0.19%	0.23%	**7.25%**	7.94%	1.87%	0.12%	0.16%	0.31%	**10.41%**	11.60%	2.51%	0.07%	0.12%	0.24%	**14.55%**
2024	4.86%	2.01%	0.14%	0.22%	0.25%	**7.48%**	8.35%	1.98%	0.14%	0.19%	0.34%	**11.00%**	12.74%	2.60%	0.09%	0.15%	0.27%	**15.86%**
2025	4.87%	2.01%	0.16%	0.25%	0.28%	**7.56%**	8.37%	1.97%	0.16%	0.22%	0.38%	**11.10%**	12.83%	2.59%	0.11%	0.18%	0.30%	**16.00%**
2026	4.87%	2.01%	0.18%	0.28%	0.28%	**7.61%**	8.39%	1.96%	0.18%	0.24%	0.38%	**11.16%**	12.90%	2.58%	0.12%	0.21%	0.30%	**16.11%**
2027	4.87%	2.01%	0.20%	0.32%	0.28%	**7.67%**	8.41%	1.96%	0.20%	0.27%	0.39%	**11.22%**	12.98%	2.57%	0.14%	0.24%	0.30%	**16.23%**
2028	4.87%	2.01%	0.20%	0.32%	0.28%	**7.67%**	8.43%	1.95%	0.20%	0.27%	0.39%	**11.24%**	13.07%	2.55%	0.16%	0.27%	0.30%	**16.35%**
2029	4.87%	2.01%	0.20%	0.32%	0.28%	**7.67%**	8.45%	1.94%	0.20%	0.27%	0.40%	**11.26%**	13.17%	2.54%	0.18%	0.30%	0.30%	**16.49%**
2030	4.87%	2.01%	0.20%	0.32%	0.28%	**7.68%**	8.47%	1.94%	0.20%	0.27%	0.40%	**11.27%**	13.27%	2.52%	0.18%	0.29%	0.30%	**16.57%**
2031	4.88%	2.01%	0.20%	0.32%	0.28%	**7.68%**	8.49%	1.93%	0.20%	0.27%	0.40%	**11.29%**	13.36%	2.51%	0.18%	0.29%	0.30%	**16.64%**
2032	4.87%	2.01%	0.20%	0.32%	0.28%	**7.68%**	8.49%	1.93%	0.20%	0.27%	0.41%	**11.30%**	13.46%	2.49%	0.18%	0.29%	0.30%	**16.73%**
2033	4.88%	2.01%	0.20%	0.32%	0.29%	**7.68%**	8.51%	1.92%	0.20%	0.27%	0.41%	**11.31%**	13.54%	2.48%	0.18%	0.29%	0.31%	**16.79%**

IT = Interruptible Tariffs, DLC = Direct Load Control, Pricing w/o ET = Pricing without Enabling Technology, Pricing w/ ET = Pricing with Enabling Technology

Source: Navigant analysis

Table 7-4. Peak Load Reduction Potential for the Companies – Maximum Scenario (% of utility MW)

Utility	KCP&L-KS						KCP&L-MO						KCP&L-GMO					
Prog Type	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total
2014	1.53%	1.55%	0%	0%	0%	**3.08%**	3.04%	0.91%	0%	0%	0%	**3.95%**	0.68%	1.10%	0%	0%	0%	**1.79%**
2015	2.03%	1.86%	0%	0%	0%	**4.01%**	4.25%	1.06%	0%	0%	0%	**5.48%**	2.10%	1.49%	0%	0%	0%	**3.73%**
2016	2.59%	2.04%	1%	1%	0.24%	**6.13%**	5.70%	1.20%	0%	1%	0.33%	**8.28%**	3.61%	1.81%	0%	0%	0.28%	**5.70%**
2017	3.11%	2.15%	1%	1%	0.35%	**8.13%**	6.92%	1.32%	1%	1%	0.48%	**10.82%**	5.11%	2.10%	0%	0%	0.41%	**7.63%**
2018	3.61%	2.22%	2%	2%	0.45%	**10.05%**	8.11%	1.44%	1%	2%	0.63%	**13.30%**	6.60%	2.38%	1%	1%	0.54%	**10.75%**
2019	4.07%	2.25%	2%	3%	0.55%	**11.90%**	9.26%	1.55%	2%	2%	0.77%	**15.74%**	8.03%	2.59%	1%	1%	0.66%	**13.73%**
2020	4.50%	2.24%	2.64%	3.64%	0.65%	**13.67%**	10.39%	1.66%	2.23%	2.96%	0.90%	**18.14%**	9.42%	2.78%	1.51%	2.17%	0.77%	**16.64%**
2021	4.90%	2.15%	3.17%	4.37%	0.74%	**15.32%**	11.48%	1.76%	2.68%	3.54%	1.03%	**20.48%**	10.78%	2.91%	2.01%	2.89%	0.87%	**19.46%**
2022	5.28%	2.06%	3.70%	5.10%	0.82%	**16.95%**	12.52%	1.86%	3.12%	4.12%	1.14%	**22.77%**	12.11%	3.05%	2.51%	3.60%	0.96%	**22.23%**
2023	5.62%	1.98%	4.22%	5.83%	0.90%	**18.55%**	13.55%	1.95%	3.56%	4.70%	1.25%	**25.02%**	13.39%	3.18%	3.01%	4.31%	1.04%	**24.93%**
2024	5.93%	1.90%	4.75%	6.56%	0.97%	**20.11%**	14.52%	2.05%	4.00%	5.29%	1.35%	**27.21%**	14.66%	3.30%	3.51%	5.02%	1.11%	**27.59%**
2025	5.90%	1.87%	5.28%	7.28%	0.94%	**21.27%**	14.47%	2.00%	4.45%	5.86%	1.31%	**28.10%**	14.67%	3.22%	4.00%	5.72%	1.07%	**28.68%**
2026	5.87%	1.84%	5.28%	7.29%	0.93%	**21.20%**	14.42%	1.96%	4.44%	5.85%	1.31%	**27.99%**	14.66%	3.15%	4.50%	6.42%	1.05%	**29.78%**
2027	5.87%	1.84%	5.28%	7.29%	0.93%	**21.21%**	14.46%	1.96%	4.43%	5.84%	1.32%	**28.01%**	14.67%	3.07%	4.99%	7.11%	1.04%	**30.89%**
2028	5.88%	1.84%	5.28%	7.29%	0.94%	**21.22%**	14.50%	1.95%	4.43%	5.84%	1.32%	**28.04%**	14.67%	3.00%	4.99%	7.09%	1.02%	**30.78%**
2029	5.88%	1.84%	5.28%	7.29%	0.94%	**21.23%**	14.54%	1.94%	4.43%	5.82%	1.33%	**28.06%**	14.79%	2.98%	4.98%	7.07%	1.02%	**30.83%**
2030	5.89%	1.84%	5.28%	7.29%	0.94%	**21.24%**	14.58%	1.94%	4.42%	5.81%	1.33%	**28.09%**	14.89%	2.95%	4.98%	7.05%	1.01%	**30.88%**
2031	5.91%	1.83%	5.28%	7.29%	0.94%	**21.25%**	14.62%	1.93%	4.42%	5.81%	1.34%	**28.11%**	14.99%	2.93%	4.97%	7.03%	1.00%	**30.92%**
2032	5.91%	1.84%	5.28%	7.29%	0.94%	**21.26%**	14.64%	1.93%	4.42%	5.80%	1.34%	**28.13%**	15.10%	2.91%	4.97%	7.01%	0.99%	**30.97%**
2033	5.92%	1.83%	5.28%	7.29%	0.94%	**21.27%**	14.67%	1.92%	4.41%	5.79%	1.35%	**28.15%**	15.18%	2.90%	4.96%	6.99%	0.98%	**31.01%**

IT = Interruptible Tariffs, DLC = Direct Load Control, Pricing w/o ET = Pricing without Enabling Technology, Pricing w/ ET = Pricing with Enabling Technology

Source: Navigant analysis

Table 7-5. Cumulative DR Budget by Program for the Companies – Realistic Scenario (million $/year)

Utility	KCP&L-KS						KCP&L-MO						KCP&L-GMO					
Prog Type	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total
2014	$1.5	$4.1	$0.0	$0.0	$0.0	**$5.7**	$3.5	$0.6	$0.0	$0.0	$0.0	**$4.1**	$0.9	$2.1	$0.0	$0.0	$0.0	**$3.0**
2015	$3.5	$8.4	$0.0	$0.0	$0.2	**$12.1**	$7.6	$2.7	$0.0	$0.0	$0.2	**$10.5**	$3.2	$6.0	$0.0	$0.0	$0.4	**$9.7**
2016	$5.9	$11.8	$0.0	$0.0	$0.3	**$18.0**	$12.6	$4.9	$0.0	$0.0	$0.4	**$17.9**	$7.3	$9.6	$0.0	$0.0	$0.5	**$17.4**
2017	$8.7	$15.0	$0.4	$0.3	$0.5	**$24.9**	$18.3	$7.2	$0.3	$0.3	$0.6	**$26.9**	$13.0	$13.2	$0.0	$0.0	$0.8	**$27.0**
2018	$12.1	$18.0	$0.4	$0.6	$0.7	**$31.8**	$24.9	$9.7	$0.4	$0.6	$1.0	**$36.6**	$20.6	$17.0	$0.0	$0.0	$1.1	**$38.7**
2019	$15.9	$20.7	$0.5	$0.9	$1.0	**$39.0**	$32.3	$12.3	$0.5	$1.0	$1.4	**$47.5**	$30.3	$20.9	$0.7	$0.7	$1.5	**$54.1**
2020	$20.3	$23.2	$0.6	$1.2	$1.4	**$46.6**	$40.6	$15.2	$0.5	$1.3	$2.0	**$59.6**	$42.2	$24.9	$0.8	$1.1	$2.0	**$70.9**
2021	$25.2	$24.9	$0.7	$1.6	$1.9	**$54.2**	$49.8	$18.2	$0.7	$1.7	$2.7	**$73.1**	$56.4	$28.7	$0.9	$1.5	$2.7	**$90.0**
2022	$30.6	$26.6	$0.8	$2.0	$2.5	**$62.4**	$60.0	$21.4	$0.8	$2.1	$3.5	**$87.8**	$73.0	$32.7	$0.9	$1.9	$3.4	**$112.0**
2023	$36.5	$28.3	$0.9	$2.5	$3.1	**$71.3**	$71.0	$24.9	$0.9	$2.6	$4.5	**$103.9**	$92.1	$37.1	$1.1	$2.5	$4.3	**$137.0**
2024	$42.9	$30.0	$1.1	$3.0	$3.9	**$80.8**	$83.0	$28.5	$1.1	$3.1	$5.6	**$121.3**	$114.0	$41.8	$1.2	$3.0	$5.2	**$165.3**
2025	$49.5	$32.4	$1.3	$3.6	$4.7	**$91.5**	$95.5	$30.9	$1.3	$3.6	$6.8	**$138.1**	$137.0	$45.4	$1.4	$3.6	$6.4	**$193.7**
2026	$56.4	$34.9	$1.5	$4.2	$5.5	**$102.5**	$108.3	$33.4	$1.5	$4.2	$8.1	**$155.6**	$161.0	$49.1	$1.6	$4.3	$7.5	**$223.5**
2027	$63.6	$37.4	$1.7	$4.9	$6.4	**$114.1**	$121.7	$35.9	$1.8	$4.9	$9.4	**$173.7**	$186.3	$52.9	$1.8	$5.1	$8.7	**$254.9**
2028	$71.0	$40.1	$1.9	$5.3	$7.3	**$125.7**	$135.6	$38.5	$2.0	$5.3	$10.8	**$192.2**	$212.9	$56.9	$2.1	$6.0	$9.9	**$287.7**
2029	$78.7	$42.8	$2.1	$5.7	$8.3	**$137.7**	$150.0	$41.2	$2.2	$5.7	$12.3	**$211.3**	$240.9	$61.0	$2.3	$6.9	$11.2	**$322.3**
2030	$86.8	$45.6	$2.4	$6.2	$9.3	**$150.3**	$164.9	$43.9	$2.5	$6.1	$13.8	**$231.2**	$270.3	$65.2	$2.6	$7.4	$12.6	**$358.2**
2031	$95.1	$48.6	$2.6	$6.6	$10.3	**$163.3**	$180.4	$46.8	$2.7	$6.5	$15.4	**$251.8**	$301.2	$69.6	$2.9	$8.0	$14.0	**$395.7**
2032	$103.7	$51.6	$2.8	$7.1	$11.4	**$176.7**	$196.5	$49.7	$3.0	$6.9	$17.0	**$273.2**	$333.8	$74.2	$3.1	$8.6	$15.5	**$435.1**
2033	$112.7	$54.8	$3.1	$7.6	$12.6	**$190.7**	$213.2	$52.7	$3.2	$7.4	$18.8	**$295.3**	$367.9	$78.9	$3.4	$9.2	$17.0	**$476.4**

IT = Interruptible Tariffs, DLC = Direct Load Control, Pricing w/o ET = Pricing without Enabling Technology, Pricing w/ ET = Pricing with Enabling Technology

Source: Navigant analysis

Table 7-6. Cumulative DR Budget by Program for the Companies – Maximum Scenario (million $/year)

Utility	KCP&L-KS						KCP&L-MO						KCP&L-GMO					
Prog Type	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total	IT	DLC	Pricing w/o ET	Pricing w/ ET	Other DR	Total
2014	$1.5	$4.1	$0.0	$0.0	$0.2	**$5.8**	$3.5	$0.6	$0.0	$0.0	$0.2	**$4.3**	$0.9	$1.8	$0.0	$0.0	$0.4	**$3.0**
2015	$3.6	$8.3	$0.4	$0.3	$0.7	**$13.4**	$8.4	$2.8	$0.3	$0.3	$1.0	**$12.8**	$3.5	$5.6	$0.0	$0.0	$1.2	**$10.3**
2016	$6.3	$11.7	$1.2	$4.8	$1.5	**$25.6**	$14.9	$5.0	$1.2	$5.3	$2.1	**$28.5**	$8.1	$9.4	$0.0	$0.0	$2.3	**$19.8**
2017	$9.5	$13.4	$2.5	$10.0	$2.5	**$37.9**	$22.9	$6.5	$2.4	$10.8	$3.6	**$46.1**	$14.8	$13.3	$0.7	$0.7	$3.8	**$33.3**
2018	$13.4	$14.9	$4.2	$16.0	$3.7	**$52.2**	$32.6	$7.8	$4.1	$17.0	$5.4	**$66.8**	$23.7	$17.6	$1.8	$6.9	$5.7	**$55.7**
2019	$17.9	$16.5	$6.3	$22.9	$5.2	**$68.8**	$44.0	$9.2	$6.1	$24.0	$7.6	**$90.8**	$35.0	$20.6	$3.4	$14.2	$7.8	**$81.0**
2020	$23.1	$18.1	$8.9	$30.7	$6.8	**$87.6**	$57.1	$10.5	$8.6	$31.8	$10.1	**$118.1**	$48.8	$23.5	$5.5	$22.5	$10.3	**$110.6**
2021	$28.9	$19.6	$12.1	$39.4	$8.7	**$108.8**	$72.1	$11.9	$11.5	$40.5	$13.0	**$149.0**	$65.3	$26.1	$8.1	$32.0	$13.0	**$144.5**
2022	$35.4	$21.2	$15.8	$49.2	$10.8	**$132.4**	$89.0	$13.5	$15.0	$50.0	$16.2	**$183.7**	$84.5	$28.9	$11.4	$42.7	$16.1	**$183.5**
2023	$42.5	$22.7	$20.1	$60.1	$13.2	**$158.6**	$107.9	$15.1	$19.0	$60.5	$19.9	**$222.4**	$106.6	$31.9	$15.3	$54.7	$19.4	**$227.9**
2024	$50.4	$24.2	$25.0	$72.1	$15.9	**$187.5**	$128.7	$16.9	$23.5	$72.0	$24.0	**$265.2**	$131.7	$35.1	$19.9	$68.1	$23.1	**$277.9**
2025	$58.4	$25.7	$30.5	$85.3	$18.6	**$218.6**	$150.2	$18.7	$28.6	$84.5	$28.1	**$310.2**	$158.0	$38.3	$25.3	$82.9	$26.8	**$331.3**
2026	$66.7	$27.3	$35.6	$93.7	$21.4	**$244.8**	$172.4	$20.5	$33.3	$91.9	$32.3	**$350.4**	$185.4	$41.6	$31.4	$99.3	$30.7	**$388.4**
2027	$75.4	$29.1	$40.9	$102.5	$24.3	**$272.1**	$195.4	$22.6	$38.1	$99.5	$36.7	**$392.3**	$213.9	$44.9	$38.5	$117.4	$34.6	**$449.3**
2028	$84.3	$31.0	$46.4	$111.5	$27.3	**$300.5**	$219.3	$24.7	$43.0	$107.3	$41.3	**$435.7**	$243.8	$48.3	$44.9	$128.5	$38.6	**$504.2**
2029	$93.7	$33.0	$52.1	$120.9	$30.4	**$330.0**	$244.1	$26.9	$48.2	$115.4	$46.1	**$480.6**	$275.2	$52.1	$51.6	$140.1	$42.9	**$561.9**
2030	$103.4	$35.0	$58.0	$130.6	$33.7	**$360.6**	$269.8	$29.1	$53.5	$123.8	$51.1	**$527.2**	$308.2	$56.1	$58.6	$152.1	$47.3	**$622.2**
2031	$113.4	$37.1	$64.1	$140.6	$37.1	**$392.4**	$296.6	$31.4	$59.0	$132.4	$56.2	**$575.6**	$342.9	$60.1	$65.9	$164.6	$51.8	**$685.3**
2032	$123.9	$39.3	$70.5	$151.1	$40.6	**$425.3**	$324.3	$33.8	$64.7	$141.3	$61.6	**$625.6**	$379.4	$64.4	$73.5	$177.5	$56.4	**$751.2**
2033	$134.8	$41.5	$77.1	$161.9	$44.3	**$459.6**	$353.0	$36.3	$70.5	$150.6	$67.2	**$677.5**	$417.7	$68.8	$81.4	$191.0	$61.3	**$820.1**

IT = Interruptible Tariffs, DLC = Direct Load Control, Pricing w/o ET = Pricing without Enabling Technology, Pricing w/ ET = Pricing with Enabling Technology

Source: Navigant analysis

BEFORE THE STATE CORPORATION COMMISSION OF THE STATE OF KANSAS

In the Matter of the Application of Kansas City Power & Light Company For Approval of Its Demand Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283.	)))))	Docket No.: 16-KCPE-446-TAR

AFFIDAVIT OF BRIAN A. FILE

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Brian A. File, being first duly sworn on his oath, states:

1. My name is Brian A. File. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Senior Manager, Products and Services.

2. I participated in the preparation of the foregoing Kansas City Power & Light Company KEEIA Cycle 1 2017-2019 Report as identified in said Report, Section 7.

3. I have knowledge of the matters set forth in said Report and that such matters are true and accurate to the best of my knowledge, information and belief.

Brian File

Brian A. File

Subscribed and sworn before me this 6th day of April, 2016.

Nicole A. Wehry

Notary Public

My commission expires: Feb. 4, 2019

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2019
Commission Number: 14391200

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Kansas City Power & Light Company For Approval of Its Demand Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283.	)))))	Docket No.: 16-KCPE-446 -TAR

AFFIDAVIT OF MARK A. FOLTZ

STATE OF MISSOURI)
) **ss**
COUNTY OF JACKSON)

Mark A. Foltz, being first duly sworn on his oath, states:

1. My name is Mark A. Foltz. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Senior Project Director.

2. I participated in the preparation of the foregoing Kansas City Power & Light Company KEEIA Cycle 1 2017-2019 Report as identified in said Report, Section 7.

3. I have knowledge of the matters set forth in said Report and that such matters are true and accurate to the best of my knowledge, information and belief.

Mark A. Foltz
Mark A. Foltz

Subscribed and sworn before me this 6th day of April, 2016.

Nicole A. Wehry
Notary Public

My commission expires: Feb. 4, 2019

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2019
Commission Number: 14391200

**BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS**

In the Matter of the Application of Kansas City Power & Light Company For Approval of Its Demand Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283.	)))))	Docket No.: 16-KCPE-446 -TAR

AFFIDAVIT OF DARRIN R. IVES

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Darrin R. Ives, being first duly sworn on his oath, states:

1. My name is Darrin R. Ives. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Vice President – Regulatory Affairs.

2. I participated in the preparation of the foregoing Kansas City Power & Light Company KEEIA Cycle 1 2017-2019 Report as identified in said Report, Section 7.

3. I have knowledge of the matters set forth in said Report and that such matters are true and accurate to the best of my knowledge, information and belief.

Darrin R. Ives

Subscribed and sworn before me this 6th day of April, 2016.

Notary Public

My commission expires: Feb. 4, 2019

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2019
Commission Number: 14391200

BEFORE THE STATE CORPORATION COMMISSION OF THE STATE OF KANSAS

In the Matter of the Application of Kansas City Power & Light Company For Approval of Its Demand Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283.	)))))	Docket No.: 16-KCPE-446-TAR

AFFIDAVIT OF TIMOTHY M. NELSON

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Timothy M. Nelson, being first duly sworn on his oath, states:

1. My name is Timothy M. Nelson. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Manager, Market Intelligence.

2. I participated in the preparation of the foregoing Kansas City Power & Light Company KEEIA Cycle 1 2017-2019 Report as identified in said Report, Section 7.

3. I have knowledge of the matters set forth in said Report and that such matters are true and accurate to the best of my knowledge, information and belief.

Timothy M. Nelson

Subscribed and sworn before me this 6th day of April, 2016.

Notary Public

My commission expires: Feb. 4, 2019

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2019
Commission Number: 14391200

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Kansas City Power & Light Company For Approval of Its Demand Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283.	)	Docket No.: 16-KCPE-446-TAR

AFFIDAVIT OF MARY BRITT TURNER

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Mary Britt Turner, being first duly sworn on her oath, states:

1. My name is Mary Britt Turner. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Director – Regulatory Affairs.

2. I participated in the preparation of the foregoing Kansas City Power & Light Company KEEIA Cycle 1 2017-2019 Report as identified in said Report, Section 7.

3. I have knowledge of the matters set forth in said Report and that such matters are true and accurate to the best of my knowledge, information and belief.

Mary Britt Turner
Mary Britt Turner

Subscribed and sworn before me this 6th day of April, 2016.

Nicole A Wehry
Notary Public

My commission expires: Feb. 4 2019

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2019
Commission Number: 14391200

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Kansas City Power & Light Company For Approval of Its Demand Side Management Portfolio Pursuant to the Kansas Energy Efficiency Investment Act ("KEEIA"), K.S.A. 66-1283.	)))))	Docket No.: 16-KCPE-446-TAR

AFFIDAVIT OF KIMBERLY H. WINSLOW

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Kimberly H. Winslow, being first duly sworn on her oath, states:

1. My name is Kimberly H. Winslow. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Director, Energy Solutions.

2. I participated in the preparation of the foregoing Kansas City Power & Light Company KEEIA Cycle 1 2017-2019 Report as identified in said Report, Section 7.

3. I have knowledge of the matters set forth in said Report and that such matters are true and accurate to the best of my knowledge, information and belief.

Kimberly H. Winslow

Kimberly H. Winslow

Subscribed and sworn before me this 6th day of April, 2016.

Nicole A. Wehry

Notary Public

My commission expires: Feb. 4 2019

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2019
Commission Number: 14391200