BEFORE THE KANSAS CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Southern Pioneer Electric Company for Approval to Make Certain Revenue Neutral Changes to its Rate Design.	**)** **)** **)** **)**	**Docket No. 24-SPEE-415-TAR**

DIRECT TESTIMONY AND SCHEDULES OF

GLENN A. WATKINS

ON BEHALF OF

THE CITIZENS' UTILITY RATEPAYER BOARD

APRIL 2, 2024

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Glenn A. Watkins. My business address is 6377 Mattawan Trail, Mechanicsville, Virginia 23116.

Q. What is your professional and educational background?

A. I am President and Senior Economist with Technical Associates, Inc., which is an economics and financial consulting firm with offices in the Richmond, Virginia area. Except for a six-month period during 1987 in which I was employed by Old Dominion Electric Cooperative, as its forecasting and rate economist, I have been employed by Technical Associates continuously since 1980.

During my career at Technical Associates, I have conducted marginal and embedded cost of service, rate design, cost of capital, revenue requirement, and load forecasting studies involving numerous electric, gas, water/wastewater, and telephone utilities. I have provided expert testimony on more than 250 occasions in Alabama, Alaska, Arizona, Delaware, Georgia, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Montana, Nevada, New Jersey, North Carolina, Ohio, Pennsylvania, Vermont, Virginia, South Carolina, Washington, and West Virginia.

I hold an M.B.A. and B.S. in economics from Virginia Commonwealth University and am a Certified Rate of Return Analyst. A more complete description of my education and experience as well as a list of my prior testimonies is provided in my Schedule GAW-1.

Q. Have you previously provided testimony before this Commission?

A. Yes. On behalf of the Citizens' Utility Ratepayer Board ("CURB"), I have provided testimony before this Commission on numerous occasions. Of particular note, I provided testimony in Southern Pioneer Electric Company's ("Southern Pioneer" or "Company") 2020 case (Docket No. 20-SPEE-169-RTS) in which the Company proposed various rate design changes as well as a Grid Access Charge for net metering customers.

Q. What is the purpose of your testimony in this proceeding?

A. Technical Associates, Inc. ("TAI") has been engaged by CURB to investigate and evaluate Southern Pioneer's proposed changes to Residential and Small General Service rate designs specifically as they relate to the Company's proposed mandatory demand charges and increases to the fixed monthly customer charges. The purpose of my testimony is to present the findings of my investigation and offer my recommendations to the Commission in these areas.

Q. Please provide a summary of your recommendations.

A. With regard to single phase Residential and Small General Service rates, I recommend that the Commission reject Southern Pioneer's proposed demand charges, and if the Commission approves the consolidation of these two rate classes (for single phase service), I recommend the current Residential customer charge be maintained at the current rate of $14.67 per month and be applicable to single phase service.

II. RESIDENTIAL & SMALL GENERAL SERVICE RATE DESIGN

Q. Please explain Southern Pioneer's current and proposed Residential and Small General Service rate structure.

A. Currently, the Company offers two Residential rates (General Use and Space Heating) and one Small General Service rate for customers with loads less than 10 KW. Southern Pioneer proposes to combine Residential and Small General Service rates with a new distinction between single phase and three phase service.[1] According to Company witness Richard Macke, the Company's proposed rates are revenue neutral based on its proposed new rate classifications between single phase and three phase service. However, it is unclear whether the Company's proposed rate design is revenue neutral for the Residential class versus Small General Service class.[2]

Under the Company's proposed rate design, Residential customers will see an increase of $2.00 per month in their fixed monthly customer charge (from $14.67 to $16.67) while single phase Small General Service customers will see a $6.07 reduction to their fixed monthly customer charges (from $22.74 to $16.67). However, the most significant aspect of the Company's proposed Residential and Small General Service rate design is the implementation of a mandatory demand charge.

The following table provides a comparison of Southern Pioneer's current and proposed Residential and Small General Service rates:

[1] Currently, there are 11,990 Residential customers served with single phase service and six customers served with three phase service. There are 2,106 Small General Service customers served with single phase service and 643 served with three phase service.

[2] Direct Testimony of Richard Macke, pages 24-25.

TABLE 1
Southern Pioneer's Current & Proposed Residential and Small General Service Rate Design

	Current			Proposed		
	Residential		Small General Service (< 10 KW)	Single Phase		Three Phase
	General Use	Space Heating		General Use	Space Heating	
Customer Charge	$14.67	$14.67	$22.74	$16.67	$16.67	$22.98
Delivery Charge						
Summer						
All KWH	$0.14358	$0.14358	$0.11876	$0.11601	$0.11601	$0.10166
Winter						
First 800 KWH	$0.13258	$0.13258	$0.10776	$0.10501	$0.10501	$0.09066
801-5,800 KWH	$0.13258	$0.11462	$0.10776	$0.10501	$0.05039	$0.09066
> 5,801 KWH	$0.13258	$0.13258	$0.10776	$0.10501	$0.10501	$0.09066
Demand Charge	--	--	--	$3.00	$3.00	$3.00

Q. What is Southern Pioneer's overarching reason for requesting a mandatory demand charge for Residential and Small General Service customers?

A. The Company's three witnesses, (Chantry Scott, Richard Macke, and Brian Beecher, claim that the proposed mandatory demand charge rate structure (also known as a three-part rate structure) will help "modernize" its rate design for Residential and Small General Service customers. However, it is apparent that the overarching reason for the Company's proposed mandatory demand charges is to address the Company's concern relating to distributed generation (primarily rooftop solar) customers being subsidized by traditional customers who do not choose or pursue distributed generation ("DG").

Indeed, the Company's policy witness Mr. Chantry Scott states that the Company's reasoning for proposing a three-part rate structure is specifically geared towards its concerns relating to DG customers.[3] In addition, Company witness Mr. Beecher sets forth

[3] Direct Testimony of Chantry Scott, pages 9 and 12.

his concerns relating to the inequities of the current two-part rate structure (customer charge plus energy charge) as they relate to the existence of distributed generation customers.[4] Company witness Mr. Macke also addresses the reasoning for the Company's proposed mandatory demand charges by claiming that the Company is "now experiencing increased heterogeneity amongst customer groups as low energy use customers may actually be high demand customers due to solar DG."[5]

Q. Before we continue, how many and what percentage of Southern Pioneer's customers have distributed generation, primarily rooftop solar?

A. According to Mr. Scott, there are 35 Residential and Commercial customers with rooftop solar installations online.[6] As a point of comparison, there are 12,527 total Residential customers[7] such that this represents less than three-tenths of one percent of Southern Pioneer's total Residential solar customers (0.28%). With regard to Commercial (General Service) customers, there are 4,126 customers[8] such that the solar customers represent less than one-tenth of one percent of the Commercial class (0.07%).

Q. Have Southern Pioneer and other Kansas utilities proposed rate design changes to address the perceived subsidization of DG customers by all other customers?

A. Yes. In Southern Pioneer's 2020 rate case (Docket No. 20-SPEE-169-RTS), the Company proposed a Grid Access Charge for new customers participating in the Company's net

[4] Direct Testimony of Brian Beecher, pages 4-5.
[5] Direct Testimony of Richard Macke, page 33.
[6] Direct Testimony of Chantry Scott, page 10.
[7] Per Mr. Macke's Exhibit PSE-2, page 2.
[8] *Id.*

metering program. This Grid Access Charge was basically a demand charge as it would reflect a flat fee per month of installed capacity of self-generation. The Company's proposal was not accepted by the Commission.

In a 2018 case (Docket No. 18-WSEE-328-RTS), Westar Energy, Inc. and Kansas Gas and Electric Company (collectively, "Evergy") proposed a three-part rate structure for Residential DG with a seasonally differentiated demand charge of $9.00 per KW in the summer months and $3.00 per KW in the winter months. The Commission initially accepted Evergy's Residential DG three-part rate structure. However, this decision was ultimately appealed, and in April 2020, the Kansas Supreme Court reversed the Commission's decision,[9] finding that implementing a three-part rate design specifically for Residential DG customers and not other residential customers was discriminatory against DG customers. The issue was remanded to the Commission for further proceedings.

During the remand portion of that case, Evergy devised two rate design options[10] in an attempt to address the Supreme Court's finding that a three-part DG rate design was discriminatory against DG customers. Option 1 provided for a Grid Access Charge applicable to DG customers that was virtually identical in concept to the Grid Access Charge proposed by Southern Pioneer in 2020. The Commission rejected Evergy's Option 1 Grid Access Charge approach and found that it did "not adequately identify or specifically recover the cost of that additional service" [which is not provided to non-DG customers].[11] Indeed, Evergy's proposed Option 1 was directly discriminatory against DG customers as

[9] In the Matter of the Joint Application of Westar Energy and Kansas Gas and Electric Co., 311 Kan. 320 (KS SC April 2020).
[10] Direct Testimony of Brad Lutz on behalf of Evergy, 18-WSEE-328-RTS, Oct. 13, 2020, Schedules BDL-1 and BDL-2.
[11] Order, Docket No. 18-WSEE-328-RTS, February 25, 2021, paragraph 45.

it was specifically targeted only to these customers. Under Option 2, Evergy proposed a minimum bill concept wherein all residential customers would be faced with a minimum bill of $35.00 per month. In its Final Order, the Commission also disapproved Evergy's Option 2 minimum bill charge, finding:

> While Evergy's minimum bill proposal is clearly non-discriminatory for DG customers compared to non-DG customers, and lawful, the Commission finds it is overly regressive and an unnecessarily disruptive solution based on the scale of the issue it purports to address.[12]

Q. Has the Kansas Legislature developed a public policy concerning self-generation with renewable resources?

A. Yes. In 2009, the Kansas Legislature passed the Renewable Energy Standards Act, which is codified as K.S.A. § 66-1256. In this statute, the Legislature declared: "it is in the public interest to promote renewable energy development in order to best utilize natural resources found in this state."

Q. If Southern Pioneer's proposed three-part Residential and Small General Service rate structure is approved, will this help promote renewable energy development, particularly as it relates to solar DG?

A. No, quite the opposite. If the proposed demand charges are approved, this will inhibit the development of renewable generation within Southern Pioneer's service area. This is because of the inherent manner in which customers with solar DG generate a portion of their energy and load requirements and also rely on Southern Pioneer's distribution system. In simple terms, while DG customers may not purchase all of their energy requirements

[12] *Id.*, at paragraph 59.

from Southern Pioneer, they will likely rely on the Company's distribution system during non-daylight hours wherein their power (KW) demand is higher than during daylight hours. As a result of the higher electric bills incurred by DG customers through a mandatory demand charge, solar generation will be less attractive financially to these customers.

Q. If Southern Pioneer's proposed three-part Residential and Small General Service rate structure is approved, will this help promote energy conservation?

A. No. As shown in Table 1 above, the Company's proposed rate design would result in reduced energy charges which is contrary to a policy of promoting energy conservation. In this regard, a customer's billed demand would be fixed once the customer reaches their peak load. As such, this rate element has no effect on promoting energy conservation throughout the month.

Q. Is there any validity to Southern Pioneer's assertions that DG customers are being subsidized by non-DG customers?

A. This issue has been debated for well over a decade. There are experts who opine that DG customers provide a net benefit to the entire system (including generation) by providing additional carbon-free energy into the system. There are other experts who are of the opinion that DG customers do not pay their "fair share" of their electric utility's cost of providing service due to their load requirements during periods in which the customer is not self-generating electricity. In my view, there is some validity to both viewpoints. However, for a typical residential customer with a small rooftop solar array, the loads placed on the utility's distribution system during periods in which the solar panels are not

generating electricity do not change the manner in which the utility builds its distribution system, simply because these loads are generally not large enough to alter the design of the system. With this being said, the "equity and fairness" issues are in the eye of the beholder.

From a mathematical perspective, it may be true that a DG customer may impose loads on the system when it is not self-generating electricity and that customer's energy usage throughout the year is lower than it would be without such self-generation. However, the reality is, these customers tend to use and purchase a reasonably large amount of electricity throughout the year, thereby contributing to the Company's fixed costs.

In my opinion, the factual concept that DG customers continue to contribute a significant amount of revenue to Southern Pioneer is most important in determining this issue because utility rate design involves a host of averages. To illustrate, it could be reasonably argued that Residential and Small General Service customers located in towns and cities (more densely populated areas) subsidize rural customers simply because there are fewer miles of distribution lines, fewer poles, fewer line transformers, and shorter service lines required to serve these customers relative to rural customers. Yet, when Residential and Small General Service rates are designed, the average cost of these facilities is used in developing all Residential and Small General Service customers' rates. While there may be technical merit to the argument that DG customers receive somewhat more incremental benefit than the incremental costs they impose on the system, this could also be said for other groups of Residential and Small General Service customers. Because Southern Pioneer's DG customers represent such a *de minimis* subset of the total Company's operations, there is no need to create a universal Residential and Small General Service rate structure geared to address any so-called subsidies received by a few DG

customers which will have no material impact on all other customers' rates. Moreover, it is apparent that Southern Pioneer's overarching objective of proposing a mandatory demand charge applicable to all Residential and Small General Service customers is contrary to the policy of promoting renewable energy.

Q. Earlier you indicated that all three of Southern Pioneer's witnesses claim that the implementation of a mandatory three-part rate structure reflects the "modernization" of rate design. Do you agree with this assertion?

A. No. While two-part electric rates (customer charge plus energy charge) have been in place since the 1880s, three-part rates (customer, energy, and demand) were first introduced by Henry L. Doherty, as early as 1900.[13] However, three-part rates have historically been utilized for larger commercial and industrial customers, such that the two-part rate for Residential and Small Commercial customers has been tried and true for over a century.

Q. Do some utilities have mandatory demand charges for Residential and Small Commercial customers?

A. Yes. However, the utilities that have implemented mandatory demand charges for Residential and Small Commercial customers consist of cooperatives and municipals that are self-regulated. As the Commission knows, Southern Pioneer is not self-regulated. In this regard, there are more than 150 investor-owned electric utilities in the United States serving almost 110 million customers that are regulated by 51 separate state (including

[13] Per James C. Bonbright, Principles of Public Utility Rates, Second Edition, page 401. In this regard, Samuel Insull, a colleague of Thomas Edison is also given credit for the invention of three-part rates (customer, energy, and demand) at the turn of the 20th Century.

District of Columbia) regulatory commissions.[14] There is not a single electric utility regulated by a state regulatory commission that has approved mandatory demand charges for residential customers.

Q. Have any other investor-owned electric utilities that are regulated by a state regulatory commission proposed mandatory residential demand charges for all Residential customers?

A. Yes. I am aware of a few instances, but none were approved. In a 2015 rate case before the Arizona Corporation Commission (Docket No. E-04204A-15-0142), UNS Electric, Inc. proposed a mandatory demand charge for all Residential and Small General Service customers. The Commission rejected that proposal.[15] In another Arizona case (Docket No. E-01345A-16-0036), Arizona Public Service Company ("APS") proposed mandatory demand charges for residential customers. APS's proposal was later dropped as the result of a settlement.

In a Massachusetts case (D.P.U. 15-155), Massachusetts Electric Company and Nantucket Electric Company proposed a transition toward mandatory demand charges for Residential, Small Commercial, and Industrial customers by proposing a tiered fixed monthly customer charge based on customer usage. In its Order, the Massachusetts Department of Public Utilities rejected that transition plan for several reasons including: (1) mandatory residential demand charges are not mandatory by any other state-regulated utility in the country; (2) customers do not have the ability to monitor their consumption

[14] The U.S. Department of Energy, Energy Information Administration reports there were 168 investor-owned Utilities as of 2017 serving on average 654,600 customers per utility, which equates to 109,972,800 customers throughout the Country. Per https://www.eia.gov/todayinenergy/detail.php?id=40913.
[15] Opinion and Order, Decision 75697, Docket No. E-04204A-15-0142.

on a real time basis; (3) customers do not have the equipment to easily monitor electricity consumption in real time; and, (4) the proposal does not meet the Department's goal of simplicity and efficiency, and does not provide strong signals to consumers to decrease energy consumption in consideration of price and non-price, social, resource, and environmental factors.[16]

In a recent (2022) rate case before the Georgia Public Service Commission (Docket No. 44280), Georgia Power Company proposed to close its two-part (customer and energy) Residential rate to new customers. In addition, the three-part (customer, energy, and demand) Residential rate was the default rate for all new customers. That is, while a three-part rate for new customers was not mandatory, if a customer did not specifically request another rate schedule (i.e., time-of-use), the new customer's rate would default to the three-part demand rate. These proposals were met with considerable opposition from the Georgia Commission Staff and other parties. In resolving these issues, the existing two-part rate was continued for all customers and the default residential rate schedule was changed from the three-part demand rate to the traditional two-part rate.[17]

In 2016, Delaware's only investor-owned electric utility, Delmarva Power & Light Company ("DPL") and the Delaware Public Service Commission Staff initiated a workshop wherein DPL proposed the future implementation of mandatory demand charges for residential customers. I participated in this workshop on behalf of the Delaware Public Advocate in which there were several meetings of interested parties. During these meetings, DPL provided presentations and analyses supporting their proposed mandatory residential demand charges. DPL's recommendations and proposals were ultimately

[16] Order, D.P.U. 15-155, September 30, 2016.
[17] Order, Docket No. 44280, December 30, 2022.

rejected by the parties wherein no formal application of mandatory residential demand charges was ever made before the Delaware Public Service Commission.

Q. Under Southern Pioneer's proposal, how will demand charges be calculated as part of Residential and Small General Service total electric bills?

A. The Company proposes that each customer's monthly billed demand will be based on each individual customer's maximum 15-minute load (KW) during each month, regardless of when that customer's peak load occurred during the month. This monthly peak load (KW) will then be multiplied by a proposed demand charge of $3.00/KW.

Q. Are Southern Pioneer's proposed Residential and Small General Service demand charges reasonable or in the public interest?

A. No, for two major reasons. First, one of the generally accepted attributes to an appropriate rate design is that it should be reasonably simple and easily understood by ratepayers. In the well-known treatise Principles of Public Utility Rates by Dr. James C. Bonbright, is the following passage:

> The administration of *any* standard or system of rate making has consequences, some of which are costly or otherwise harmful; and these consequences may warrant the rejection of one system in favor of some other system admittedly less efficient in the performance of its recognized economic functions. Thus an elaborate structure of rates designed to make scientific allowance for the relative cost of different kinds of service may possibly be rejected in favor of a simpler structure more readily understood by consumers and less expense to administer. And thus a system of rate regulation that would come closest to assuring a company of its continued ability to earn a capital-attracting rate of return may be rejected in favor of an alternative system that runs less danger of removing incentives to managerial efficiency. The art of rate making is an art of wise

compromise.[18]

Based on my experience, not only lay people (not involved in public utility regulation), but also many non-rate design experts and attorneys within this industry do not understand the concept of power versus energy. That concept being: power (KW) is instantaneous load whereas energy (KWH) reflects load over time. Most people understand the concept of energy, in that the more energy that is used, the more that an individual customer should pay. However, residential consumers do not understand the concept of an electric bill component based on the maximum load placed on a system over a 15-minute interval.

Second, Southern Pioneer's proposed demand charges based on each individual customer's peak load (i.e., non-coincident peak demand) is not reflective of cost causation due to the diversity that exists within the system as well as within each class. Indeed, and as acknowledged by Company witness Macke, "customer load shapes are probably more diverse than ever."[19] To better explain, individual customers' maximum load requirements vary across hours of the day as well as days of the week.

To illustrate, one residential customer has a family with children, and they cook dinner, bathe the children, watch television, etc. early in the evening, say between 6 p.m. and 7 p.m. Another customer is single and tends to work late in the evening wherein this customer's peak load is between 8 p.m. and 9 p.m. Yet, a third customer is a family in which household chores, family members at home using appliances etc. tend to have a peak load during the weekend. This diversity benefits all customers within Southern Pioneer's

[18] Bonbright, James C., Principles of Public Utility Rates, 1961, pages 37-38.
[19] Direct Testimony of Richard Macke, page 33.

system in that loads are spread across various hours and days of the week. However, Southern Pioneer's proposed demand charge is based on each individual customer's maximum load (demand) regardless of when it occurs. I attempted to analyze the diversity that exists among individual customer load shapes and the diversity of peak demands in data requests CURB-4, CURB-5, and CURB-6. However, the Company's responses indicated that the requested data is not available.

Q. Have other authorities discussed the flaws with residential demand charges?

A. Yes. The former chairman of the Federal Energy Regulatory Commission ("FERC"), Jon Wellinghoff, provided his analytical opinion relating to residential demand charges that was published in 2016. A copy of Mr. Wellinghoff's paper is provided in my Schedule GAW-2. In short, Mr. Wellinghoff's conclusions and opinions are virtually identical to those I have discussed.

Q. What are your conclusions regarding Southern Pioneer's proposed mandatory demand charges for all Residential and Small General Service customers?

A. It is clear that the Company's proposal is nothing more than an end-around attempt to address its concerns of cost shifting regarding DG and is at odds with the State's legislative policy as set forth in K.S.A. § 66-1256. Furthermore, Southern Pioneer's DG customers represent less than one percent of its Residential and Small General Service customers such that the Company's proposal is nothing more than a solution in search of a realistic problem; i.e., results in the tail wagging the dog.

With regard to the proposed structure of the Residential and Small General Service demand charges, most residential customers do not understand the concepts of demand versus energy and, therefore, the proposed three-part rate structure would violate the principle that utility rates should be selected based upon simplicity of structure and the capability of being readily understood by ratepayers. Finally, the Company's proposed demand charges, which are based on each individual customer's maximum demand regardless of when it occurs, does not reflect cost causation wherein the imposition of the proposed demand charges will not reduce overall system costs. As such, I recommend that the Company's proposed demand charges for Residential and Small General Service customers be rejected.

III. CUSTOMER CHARGES

Q. Is Southern Pioneer's proposed increase to the Residential single phase fixed monthly customer charge reasonable or in the public interest?

A. No. As indicated in Table 1 earlier in my testimony, Southern Pioneer proposes a $2.00 increase to the Residential fixed monthly charge associated with single phase service; i.e., from $14.67 to $16.67. Furthermore, due to the Company's proposal to consolidate the rates between single phase Residential and single phase Small General Service, Southern Pioneer proposes to reduce the single phase Small General Service customer charge from $22.74 to $16.67.

Q. Does the Company's proposed increase to the Residential (single phase) fixed monthly customer charge violate the economic theory of competitive markets?

A. Yes. The most basic tenet of competition is that prices determined through a competitive market ensure the most efficient allocation of society's resources. Because public utilities are generally afforded monopoly status under the belief that resources are better utilized without duplicating the fixed facilities required to serve consumers, a fundamental goal of regulatory policy is that regulation should serve as a surrogate for competition to the greatest extent practical.[20] As such, the pricing policy for a regulated public utility should mirror those of competitive firms to the greatest extent practical.

Q. Please briefly discuss how prices are generally structured in competitive markets.

A. Under economic theory, efficient price signals result when prices are equal to marginal costs.[21] It is well known that costs are variable in the long run. Therefore, efficient pricing results from the incremental variability of costs even though a firm's short-run cost structure may include a high level of sunk or "fixed" costs or be reflective of excess capacity. Indeed, competitive market-based prices are generally structured based on usage; i.e., volume-based pricing. Thus, in a competitive market, sunk or "fixed" costs are fairly recovered through the sale of goods. Southern Pioneer has not offered any compelling reason to ignore this competitive practice. To the contrary, the high customer charges proposed by Southern Pioneer would penalize customers who attempt to conserve energy and heighten the energy burden on low-income customers during summer months when their electricity bills are high due to the extreme heat in Southwest Kansas.

[20] James C. Bonbright, et al., Principles of Public Utility Rates, p. 141 (Second Edition, 1988).
[21] Strictly speaking, efficiency is achieved only when there is no excess capacity such that short-run marginal costs equal long-run marginal costs. In practice, there is usually at least some excess capacity present such that pricing based on long-run marginal costs represents the most efficient utilization of resources.

Q. Please briefly explain the economic principles of efficient price theory and how short-run fixed costs are recovered under such efficient pricing.

A. Perhaps the best known micro-economic principle is that in competitive markets (i.e., markets in which no monopoly power or excessive profits exist), prices are equal to marginal cost. Marginal cost is equal to the incremental change in cost resulting from an incremental change in output. A full discussion of the calculus involved in determining marginal costs is not appropriate here. However, it is readily apparent that because marginal costs measure the changes in costs with output, short-run "fixed" costs are irrelevant in efficient pricing. This is not to say that efficient pricing does not allow for the recovery of short-run fixed costs. Rather, they are reflected within a firm's production function such that no excess capacity exists and that an increase in output will require an increase in costs — including those considered "fixed" from an accounting perspective. As such, under efficient pricing principles, marginal costs capture the variability of costs, and prices are variable because prices equal these costs.

Q. Please explain how efficient pricing principles are applied to the electric utility industry.

A. Universally, utility marginal cost studies include three separate categories of marginal costs: demand, energy, and customer. Consistent with the general concept of marginal costs, each of these costs varies with incremental changes. Marginal demand costs measure the incremental change in costs resulting from an incremental change in peak load (demand). Marginal energy costs measure the incremental change in costs resulting from an incremental change in KWH (energy) consumption. Marginal customer costs measure

the incremental change in costs resulting from an incremental change in number of customers.

Particularly relevant here is understanding what costs are included within, and the procedures used to determine marginal customer costs. Since marginal customer costs reflect the measurement of how costs vary with the number of customers, they only include those costs that directly vary as a result of adding a new customer.

Q. Please explain how this theory of competitive pricing should be applied to regulated public utilities such as Southern Pioneer.

A. Due to Southern Pioneer's investment in system infrastructure, there is no debate that many of its short-run costs are fixed in nature. However, as discussed above, efficient competitive prices are established based on long-run costs, which are entirely variable in nature.

Marginal cost pricing only relates to efficiency. This pricing does not attempt to address fairness or equity. Fair and equitable pricing of a regulated monopoly's products and services should reflect the benefits received for the goods or services. In this regard, those that receive more benefits should pay more in total than those who receive fewer benefits. Regarding electricity usage, the level of consumption is the best and most direct indicator of benefits received. Thus, volumetric pricing promotes the fairest pricing mechanism to customers and to the utility.

The above philosophy has consistently been the belief of economists, regulators, and policy makers for generations. For example, consider utility industry pricing in the 1800s, when the industry was in its infancy. Customers paid a fixed monthly fee and

consumed as much of the utility commodity/service as they desired (usually water). It soon became apparent that this fixed monthly fee rate schedule was inefficient and unfair. Utilities soon began metering their commodity/service and charging only for the amount actually consumed. In this way, consumers receiving more benefits from the utility paid more, in total, for the utility service because they used more of the commodity.

Q. Is the electric utility industry unique in its cost structures, which are comprised largely of fixed costs in the short-run?

A. No. Most manufacturing and transportation industries are comprised of cost structures predominated with "fixed" costs. These fixed costs, also called "sunk" costs, are primarily comprised of investments in plant and equipment. Indeed, virtually every capital-intensive industry is faced with a high percentage of so-called fixed costs in the short run. Prices for competitive products and services in these capital-intensive industries are invariably established on a volumetric basis, including those that were once regulated, e.g., motor transportation, airline travel, and rail service.

Q. How are high fixed customer charge rate structures contrary to effective conservation efforts?

A. High fixed charge rate structures actually promote additional consumption because a consumer's price of incremental consumption is less than what an efficient price structure would otherwise be. A clear example of this principle is exhibited in the natural gas transmission pipeline industry. As discussed in its well-known Order 636, the FERC's

adoption of a "Straight Fixed Variable" ("SFV") pricing method[22] was a result of national policy (primarily that of Congress) to encourage increased use of domestic natural gas by promoting additional interruptible (and incremental firm) gas usage. The FERC's SFV pricing mechanism greatly reduced the price of incremental (additional) natural gas consumption. This resulted in significantly increasing the demand for, and use of, natural gas in the United States after Order 636 was issued in 1992.

FERC Order 636 had two primary goals. The first goal was to enhance gas competition at the wellhead by completely unbundling the merchant and transportation functions of pipelines.[23] The second goal was to encourage the increased consumption of natural gas in the United States. In Order 636's introductory statement, FERC stated:

> The Commission's intent is to further facilitate the unimpeded operation of market forces to stimulate the production of natural gas... [and thereby] contribute to reducing our Nation's dependence upon imported oil… .[24]

With specific regard to the SFV rate design adopted in Order 636, FERC stated:

> Moreover, the Commission's adoption of SFV should maximize pipeline throughput over time by allowing gas to compete with alternate fuels on a timely basis as the prices of alternate fuels change. The Commission believes it is beyond doubt that it is in the national interest to promote the use of clean and abundant gas over alternate fuels such as foreign oil. SFV is the best method for doing that.[25]

Recently, some public utilities have begun to advocate for SFV residential pricing, claiming a need for enhanced fixed charge revenues. To support their claim, the companies argue that because retail rates have been historically volumetrically based, there has been

[22] Under SFV pricing, customers pay a fixed charge that is designed to recover all of the utility's fixed costs.
[23] Federal Energy Regulatory Commission, Docket Nos. RM91-11-001 and RM87-34-065, Order No. 636 (Apr. 9, 1992), p. 7.
[24] *Id.* p. 8 (alteration in original).
[25] *Id.* pp. 128-129.

a disincentive for utilities to promote conservation or encourage reduced consumption. However, the FERC's objective in adopting SFV pricing suggests the exact opposite. The price signal that results from SFV pricing is meant to promote additional consumption, not reduce consumption. Thus, a rate structure that has a high level of fixed monthly customer charges sends an even stronger price signal to consumers to use more energy.

Q. As a public policy matter, what is the most effective tool that regulators have to promote cost effective conservation and the efficient utilization of resources?

A. Unquestionably, one of the most important and effective tools that this, or any, regulatory Commission has to promote conservation is developing rates that send proper price signals to conserve and utilize resources efficiently. A pricing structure that is largely fixed, such that customers' effective prices do not properly vary with consumption, promotes the inefficient utilization of resources. Pricing structures with high fixed charges are much more inferior from a conservation and efficiency standpoint than pricing structures that require consumers to incur more cost with additional consumption.

Q. Notwithstanding the efficiency reasons as to why regulation should serve as a surrogate for competition, are there other relevant aspects to the pricing structures in competitive markets *vis a vis* those of regulated utilities?

A. Yes. In competitive markets, consumers, by definition, have the ability to choose various suppliers of goods and services. Consumers and the competitive market have a clear preference for volumetric pricing. Utility customers are not so fortunate in that the local utility is a monopoly. The only reason utilities are able to seek pricing structures with high

fixed monthly charges is due to their monopoly status. In my opinion, this is a critical consideration in establishing utility pricing structures. Competitive markets and consumers in the United States have demanded volumetric-based prices for generations. A regulated utility's pricing structure should not be allowed to counter the collective wisdom of markets and consumers simply because of its market power.

Q. Does Mr. Macke provide any support or rationale for his proposal to increase the monthly single phase Residential customer charge to $16.67?

A. Yes. Mr. Macke also sponsors the Company's class cost of service study ("CCOSS") wherein he calculated a Residential "customer cost" of $21.04 per month.[26] In developing his "customer cost," Mr. Macke first functionalized all rate base and operating income amounts between power supply, transmission, and distribution. He then "classified" these functionalized costs into various costing buckets. With respect to functionalized distribution costs, Mr. Macke's classified costing buckets were separated between Substations, Primary Lines, Transformers, Secondary & Service, Meters, Account & Services, and Revenues.

Q. Do Mr. Macke's calculated "customer costs" include costs that should not be considered in developing Residential fixed monthly charges?

A. Yes. Due to the structure and presentation of Mr. Macke's CCOSS, it is not possible to determine which costs are, and are not, included within his "customer costs" without a detailed analysis of his electronic CCOSS spreadsheet. This is because of the way Mr.

[26] Per Mr. Macke's Exhibit PSE-3, page 3.

Macke first placed every rate base and operating income account into one of three functional buckets and then assigned each functional cost bucket to various "classification" buckets. By drilling down through Mr. Macke's electronic spreadsheet, I was able to replicate his results by separating his costs on an account-by-account basis as shown in the table below:

TABLE 2
Macke Residential Customer Cost Calculation

		Total Residential [27]
O&M Expenses		
580	Oper. Super & Eng.	$102,190
581	Load Dispatch	$84,139
586	Oper. Meters	$275,009
588	Oper. Misc. Oper.	$222,220
590	Main. Super. & Eng.	$132
597	Main. Meters	$760
598	Main. Misc. Dist.	$111
902	Meter Reading Expense	$32,593
903	Records & Collections	$919,210
904	Uncollectible Accounts	$59,003
905	Misc. Customer Account	$36,465
907	Supervision	$19,461
908	Customer Assistance	$160,195
910	Misc. Cust Serv. & Info	$22,669
912	Demonstrating & Selling	$2,748
920-932	A&G	$396,918
	Total O&M	$2,333,823
Miscellaneous Non-O&M Expenses		
426,431	Meters	$76,744
	Cust. Acct.	$140,396
	Total Miscellaneous	$217,139
Depreciation Expense		
407	Services	$37,817
	Meters	$158,137
	Total Depreciation	$195,955
Interest & Margins		
	Interest – Services	$60,431
	Interest – Meters	$252,698
	Margin – Services	$19,915
	Margin – Meters	$83,278
	Total Interest & Margins	$416,323
Total Revenue Requirement		$3,163,240
Number of Bills		150,324
Customer Cost Per Month		$21.04

[27] Residential General Use and Residential Space Heating combined.

In evaluating customer charges, these fixed charge rates should only reflect those incremental costs required to connect and maintain a customer's account. However, Mr. Macke's customer cost analysis includes a multitude of costs that reflect overhead and general business costs that are more appropriately collected in variable energy charges. The following is a detailed discussion on an account-by-account basis of those costs that should be excluded (in whole, or in part) from Mr. Macke's "customer cost" analysis:[28]

Account 580 (Distribution Operations Supervision & Engineering) – This account includes expenses incurred in the general supervision and direction of the operation of the distribution system. Direct supervision of specific activities shall be charged to the (other) appropriate accounts. As such, this is a general overhead expense in which these costs do not directly vary with number of customers and are not required to connect and maintain a customer's account.

Account 581 (Load Dispatch) – This account includes expenses incurred in load dispatching operations pertaining to the distribution of electricity. As such, this has nothing to do with customers' simply being connected to the distribution system.

Account 588 (Distribution Miscellaneous Operations) – This account includes expenses in distribution operation not provided for elsewhere. As such, this is a general overhead expense in which these costs do not directly vary with number of customers and are not required to connect and maintain a customer's account.

Account 590 (Distribution Maintenance Supervision & Engineering) – This account includes expenses incurred in the general supervision and direction of maintenance of the distribution system. Direct supervision of specific activities shall be charged to the

[28] The account descriptions are based on the Rural Utilities Service ("RUS") Uniform System of Accounts – Electric, May 2008.

(other) appropriate accounts. As such, this is a general overhead expense in which these costs do not directly vary with number of customers and are not required to connect and maintain a customer's account.

Account 598 (Distribution Miscellaneous Maintenance) – This account includes expenses incurred in the maintenance of distribution plant not provided for elsewhere. As such, this is a general overhead expense in which these costs do not directly vary with number of customers and are not required to connect and maintain a customer's account.

Account 904 (Uncollectibles) – This account includes expenses incurred for all uncollectible utility revenues which include all revenues which are largely volumetrically-related.

Account 907 (Customer Service & Information Supervision) – This account includes expenses incurred in the general direction and supervision of customer service activities, the object of which is to encourage safe, efficient, and economical use of the utility's service. As such, these expenses are related to usage and not required to connect and maintain a customer's account.

Account 908 (Customer Assistance) – This account includes expenses incurred in providing instructions or assistance to customers, the object of which is to encourage safe, efficient, and economical use of the utility's service. As such, these expenses are related to usage and not required to connect and maintain a customer's account.

Account 910 (Miscellaneous Customer Service & Informational) – This account includes expenses incurred in connection with customer service and informational activities, which are not includable in other customer information expense accounts. Because customer service and informational expenses are related to the encouragement of

safe, efficient, and economical use of the utility's service, these expenses are related to usage and not required to connect and maintain a customer's account.

Account 912 (Demonstrating & Selling) – This account includes expenses incurred in promotional, demonstrating, and selling activities (except by merchandising), the object of which is to promote or retain the use of utility services by present and prospective customers. As such, these expenses are not required to connect and maintain a customer's account.

Accounts 920-932 (Administrative & General) – These accounts reflect overall company overhead expenses including: A&G Salaries (Account 920); Office Supplies & Expenses (Account 921); Outside Services (Account 923); Property Insurance (Account 924); Injuries & Damages (Account 925); Employee Pensions & Benefits not recorded elsewhere (Account 926); Franchise Requirements (Account 927); Regulatory Commission Expenses (Account 928); General Advertising (Account 930.1); Miscellaneous General Expenses (Account 930.2); and, Rents (Account 931). These overhead expenses do not directly vary with number of customers and are not required to connect and maintain a customer's account.

Taxes & Miscellaneous – Mr. Macke's "Miscellaneous" expense category includes: Other Interest expense (Account 431); Donations (Account 426.1); Scholarship Awards (Account 426.13); Penalties (Account 426.3); Other Deductions (Account 426.5); Pension Net Periodic Benefit Costs (Account 426.6); Amortization of Mortgage Fees (Account 428.0); Amortization of Loss on Reacquired Debt (Account 428.1); and, Other Taxes (Account 408). These costs included by Mr. Macke are not related to the cost to connect and maintain a customer's account.

Q. Have you conducted a customer cost analysis for the Residential and Small General Service classes that excludes those items discussed above and only includes those costs required to connect and maintain a customer's account?

A. Yes. My Schedule GAW-3 provides my analyses of the Residential and Small General Service "customer costs" that should be considered in developing customer charges. As indicated, I have determined that the Residential customer cost is $12.48 per month and the Small General Service customer cost is $13.61 per month. These amounts compared to Mr. Macke's calculations of $21.04 per month and $22.98, respectively.

Q. Is there academic support for your opinion that certain distribution costs classified as "customer-related," as well as a significant portion of the company's overhead expenses, are not properly considered as true customer costs?

A. In his well-known treatise Principles of Public Utility Rates, Professor James C. Bonbright states:

> . . . if the hypothetical cost of a minimum-sized distribution system is properly excluded from the demand-related costs for the reason just given, while it is also denied a place among the customer costs for the reason stated previously, to which cost function does it then belong? The only defensible answer, in our opinion, is that it belongs to none of them. Instead, it should be recognized as a strictly unallocable portion of total costs. And this is the disposition that it would probably receive in an estimate of long-run marginal costs. But fully-distributed cost analysts dare not avail themselves of this solution, since they are the prisoners of their own assumption that "the sum of the parts equals the whole." **They are therefore under impelling pressure to fudge their cost apportionments by using the category of customer costs as a dumping ground for costs that they cannot plausibly impute to any of their other cost categories.** [Emphasis added] (Second Edition, page 492)

Q. Is there an authoritative publication that discusses the determination of Residential customer charges for rate design purposes?

A. Yes. A NARUC Publication entitled Charging for Distribution Utility Services: Issues in Rate Design states the following as it relates to the determination of fixed monthly customer charges:

> In evaluating proposals for redesign of distribution rates, commissions may be asked to consider structures that call for some blend of customer and usage charges, weighted so as to increase the revenue share of the fixed rate elements (in relation to historical allocations). Although much of the discussion in this paper has been cast in either-or terms (usage-based vs. fixed rates), its general prescriptions apply no less to any intermediate proposal: the magnitude of a shift from usage-based to fixed rate elements will have predictable effects on consumer demand, utility revenues, and long-term dynamic efficiency. As one moves along the continuum of rate designs from usage-based to fixed, the benefits of the former give way more and more to the difficulties of the latter. This is the kind of trade-off that commissions are often faced with balancing: **our analysis concludes that the balance strongly favors a rate structure that allows consumers to avoid charges, when there [are] cost-effective alternatives that they value more highly. Usage-based rates fit this bill; so do hook-up fees** [Emphasis added] (page 46).

Q. What is your recommendation regarding fixed monthly customer charges for Southern Pioneer's single phase Residential and Small General Service customers?

A. Even though my customer cost analysis indicates that a reduction to the fixed monthly customer charges is warranted, I recommend that the current Residential customer charge of $14.67 per month be maintained, to be also applicable to single phase Small General Service if consolidation of these classes is approved.

Q. Do you have any objection to the Company's proposal to separate single phase and three phase service for the Residential and Small General Service classes?

A. No.

Q. Does this complete your testimony?

A. Yes.

VERIFICATION

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HANOVER) ss:

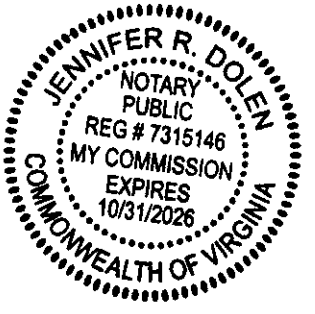
Glenn A. Watkins, being duly sworn upon his oath, deposes and states that he is a consultant for the Citizens' Utility Ratepayer Board, that he has read and is familiar with the foregoing *Direct Testimony*, and that the statements made herein are true and correct to the best of his knowledge, information, and belief.

Glenn A. Watkins

SUBSCRIBED AND SWORN to before me this 28 day of March, 2024.

Jennifer D. Polansky, Notary Public
I was commissioned as Jennifer R. Dolen

My Commission expires: October 31, 2026
Reg. #7315146



BACKGROUND & EXPERIENCE PROFILE

GLENN A. WATKINS

PRESIDENT/SENIOR ECONOMIST
TECHNICAL ASSOCIATES, INC.

EDUCATION

1982 - 1988	M.B.A., Virginia Commonwealth University, Richmond, Virginia
1980 - 1982	B.S., Economics; Virginia Commonwealth University
1976 - 1980	A.A., Economics; Richard Bland College of The College of William and Mary, Petersburg, Virginia

POSITIONS

Jan. 2017-Present	President/Senior Economist, Technical Associates, Inc.
Mar. 1993-Dec. 2016	Vice President/Senior Economist, Technical Associates, Inc. (Mar. 1993-June 1995 Traded as C. W. Amos of Virginia)
Apr. 1990-Mar. 1993	Principal/Senior Economist, Technical Associates, Inc.
Aug. 1987-Apr. 1990	Staff Economist, Technical Associates, Inc., Richmond, Virginia
Feb. 1987-Aug. 1987	Economist, Old Dominion Electric Cooperative, Richmond, Virginia
May 1984-Jan. 1987	Staff Economist, Technical Associates, Inc.
May 1982-May 1984	Economic Analyst, Technical Associates, Inc.
Sep. 1980-May 1982	Research Assistant, Technical Associates, Inc.

EXPERIENCE

I. Public Utility Regulation

A. Costing Studies -- Conducted, and presented as expert testimony, numerous embedded and marginal cost of service studies. Cost studies have been conducted for electric, gas, telecommunications, water, and wastewater utilities. Analyses and issues have included the evaluation and development of alternative cost allocation methods with particular emphasis on ratemaking implications of distribution plant classification and capacity cost allocation methodologies. Distribution plant classifications have been conducted using the minimum system and zero-intercept methods. Capacity cost allocations have been evaluated using virtually every recognized method of allocating demand related costs (e.g., single and multiple coincident peaks, non-coincident peaks, probability of loss of load, average and excess, and peak and average).

Embedded and marginal cost studies have been analyzed with respect to the seasonal and diurnal distribution of system energy and demand costs, as well as cost effective approaches to incorporating energy and demand losses for rate design purposes. Economic dispatch models have been evaluated to determine long range capacity requirements as well as system marginal energy costs for ratemaking purposes.

B. Rate Design Studies -- Analyzed, designed and provided expert testimony relating to rate structures for all retail rate classes, employing embedded and marginal cost studies. These rate structures have included flat rates, declining block rates, inverted block rates, hours use of demand blocking, lighting rates, and interruptible rates. Economic development and special industrial rates have been developed in recognition of the competitive environment for specific customers. Assessed alternative time differentiated rates with diurnal and seasonal pricing structures. Applied Ramsey (Inverse Elasticity) Pricing to marginal costs in order to adjust for embedded revenue requirement constraints.

GLENN A. WATKINS

C. Forecasting and System Profile Studies -- Development of long range energy (Kwh or Mcf) and demand forecasts for rural electric cooperatives and investor owned utilities. Analysis of electric plant operating characteristics for the determination of the most efficient dispatch of generating units on a system-wide basis. Factors analyzed include system load requirements, unit generating capacities, planned and unplanned outages, marginal energy costs, long term purchased capacity and energy costs, and short term power interchange agreements.

D. Cost of Capital Studies -- Analyzed and provided expert testimony on the costs of capital and proper capital structures for ratemaking purposes, for electric, gas, telephone, water, and wastewater utilities. Costs of capital have been applied to both actual and hypothetical capital structures. Cost of equity studies have employed comparable earnings, DCF, and CAPM analyses. Econometric analyses of adjustments required to electric utilities cost of equity due to the reduced risks of completing and placing new nuclear generating units into service.

E. Accounting Studies -- Performed and provided expert testimony for numerous accounting studies relating to revenue requirements and cost of service. Assignments have included original cost studies, cost of reproduction new studies, depreciation studies, lead-lag studies, Weather normalization studies, merger and acquisition issues and other rate base and operating income adjustments.

II. Transportation Regulation

A. Oil and Products Pipelines -- Conducted cost of service studies utilizing embedded costs, I.C.C. Valuation, and trended original cost. Development of computer models for cost of service studies utilizing the "Williams" (FERC 154-B) methodology. Performed alternative tariff designs, and dismantlement and restoration studies.

B. Railroads -- Analyses of costing studies using both embedded and marginal cost methodologies. Analyses of market dominance and cross-subsidization, including the implementation of differential pricing and inverse elasticity for various railroad commodities. Analyses of capital and operation costs required to operate "stand alone" railroads. Conducted cost of capital and revenue adequacy studies of railroads.

III. Insurance Studies

Conducted and presented expert testimony relating to market structure, performance, and profitability by line and sub-line of business within specific geographic areas, e.g. by state. These studies have included the determination of rates of return on Statutory Surplus and GAAP Equity by line - by state using the NAIC methodology, and comparison of individual insurance company performance vis a vis industry Country-Wide performance.

Conducted and presented expert testimony relating to rate regulation of workers' compensation, automobile, and professional malpractice insurance. These studies have included the determination of a proper profit and contingency factor utilizing an internal rate of return methodology, the development of a fair investment income rate, capital structure, cost of capital.

Other insurance studies have included testimony before the Virginia Legislature regarding proper regulatory structure of Credit Life and P&C insurance; the effects on competition and prices resulting from proposed insurance company mergers, maximum and minimum expense multiplier limits, determination of specific class code rate increase limits (swing limits); and investigation of the reasonableness of NCCI's administrative assigned risk plan and pool expenses.

GLENN A. WATKINS

IV. Anti-Trust and Commercial Business Damage Litigation

Analyses of alleged claims of attempts to monopolize, predatory pricing, unfair trade practices and economic losses. Assignments have involved definitions of relevant market areas(geographic and product) and performance of that market, the pricing and cost allocation practices of manufacturers, and the economic performance of manufacturers' distributors.

Performed and provided expert testimony relating to market impacts involving automobile and truck dealerships, incremental profitability, the present value of damages, diminution in value of business, market and dealer performance, future sales potential, optimal inventory levels, fair allocation of products, financial performance; and business valuations.

MEMBERSHIPS AND CERTIFICATIONS

Member, Association of Energy Engineers (1998)
Certified Rate of Return Analyst, Society of Utility and Regulatory Financial Analysts (1992)
Member, American Water Works Association
National Association of Business Economists
Richmond Association of Business Economists
National Economics Honor Society

UTILITY DIVE

OPINION

The flaws in the utilities' push for residential demand charges

Time-based rates offer far better incentives, argue James Tong and Jon Wellinghoff

Published Oct. 3, 2016

By James Tong, Jon Wellinghoff

Flickr user Sarah Elizabeth Simpson

The following is a guest post from James Tong and Jon Wellinghoff. Tong is the CEO of Advanced Grid Consulting and Wellinghoff is the Chief Policy Officer at SolarCity and a former FERC commissioner.

Previously, we wrote about how fixed charges represent a false fix to utilities' revenue challenges, potentially hurting all customers as well as utility shareholders. While some have since backpedaled on fixed charges, others are doubling down and pushing for mandatory residential demand charges.

To fairly evaluate the merits of demand charges, we should understand the utilities' conundrum. Utilities must continually invest billions of dollars to ensure enough capacity to meet the demands of all customers at all times. Utilities mostly recover these investment costs, which are largely fixed, through variable charges, i.e., flat rates on every kilowatt-hour (kWh) consumed.

Recovering fixed costs through variable charges historically wasn't a problem, as strong growth in demand for electricity meant a strong revenue base to pay for those costs. But in recent decades, demand growth has been falling dramatically, which is eroding the revenue base (see Figure 1).

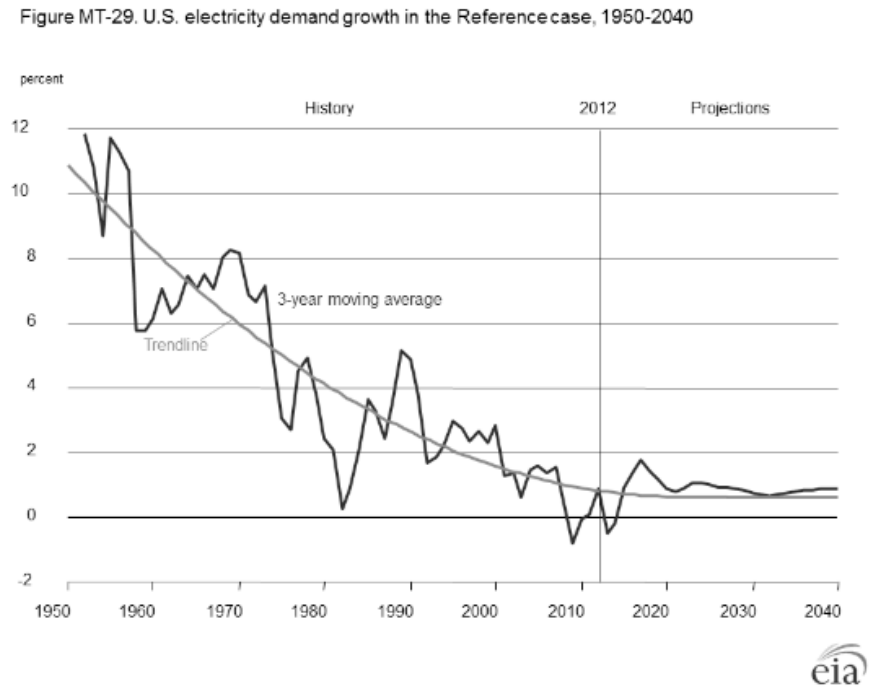


Figure 1. Electricity demand growth has been on the decline for the last half-century, stagnating after the 2008-09 recession.
EIA

Compounding the problem, peak demand has been deviating from average demand (see Figure 2). This means that utilities are increasingly building and maintaining more capacity to meet peak demand but are, on average, getting less usage from it. Less usage means less kWh sales or revenues to pay for that expensive capacity. And the majority of any given utility's distribution resource needs are projected to stem from capacity additions to meet peak usage on the system.

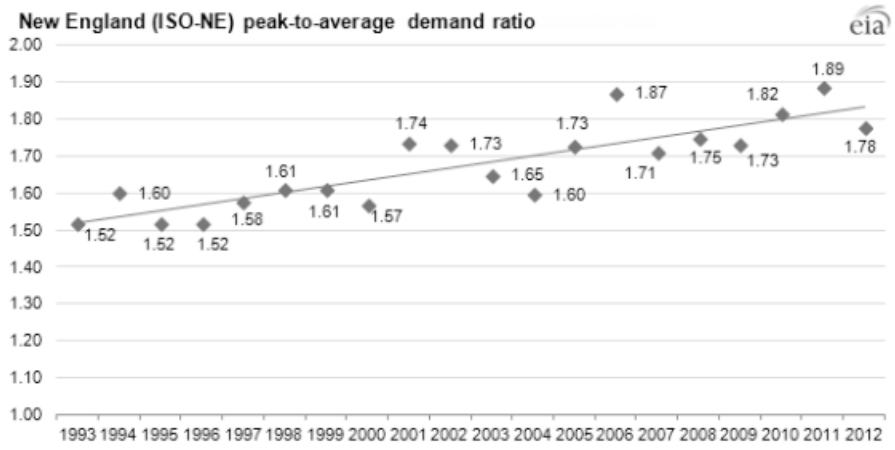


Figure 2. A ratio of 1.78 means that peak demand is 78% higher than average demand. A higher ratio indicates a lower asset-utilization rate.
EIA

With declining revenues and rising costs, utilities must either raise electric rates (which can discourage consumption, thereby further eroding their revenue base) or find other ways to charge customers. So utilities have been pushing increased fixed charges and now demand charges.

The case for residential demand charges

Demand charges vary. The ones being proposed for residential customers typically involve monthly fees based on one's highest average usage (measured in kilowatt or kW) over a certain time interval (e.g., 15 minutes) in a given billing period. Demand charges have long been used for commercial and industrial customers, who tend to be more sophisticated than residential customers about energy consumption and have far greater peak usage, often measured in megawatts. But given trends in costs and revenues, utilities are now seeking demand charges for residential customers, and most controversially, to make them mandatory or the default option for all.

Proponents justify demand charges on three grounds: transparency, equity, and efficiency. First, demand charges would send more transparent pricing signals of the enormous and largely fixed costs required to meet peak grid demand.

Second, they would assign costs more equitably to cost-causers and restore the "cost-causation principle". Those who use energy more intensively (thus requiring more capacity) would pay more.

Finally, demand charges would incentivize more efficient consumption to lower peak demand, thereby lowering grid costs. Even more, demand charges would unlock new opportunities for technology providers – such as storage companies – and for customers to lower their energy bills.

A closer look at demand charges

For these utility arguments to be valid, two conditions unequivocally must be true: 1) residential customers must be able to understand demand charges, and 2) demand charges must reflect incremental costs of customer usage (that is, costs created from customers' actions, such as turning on air conditioners, and not costs incurred prior to those actions).

But there is scant evidence that customers could ever understand the difference between kWh versus kW (even industry experts regularly confuse "energy" and "power"), much less respond to how each is priced. An incentive is meaningless when nobody can take advantage of it. In this regard, demand charges may be no better than fixed charges – and perhaps in some instances, even worse. Innocuous activities, like doing chores (vacuuming while running your washer and dryer) on a cool Saturday afternoon, may result in a significantly higher bill, even though such actions would create minimal grid costs.

This speaks to the bigger problem of proposed demand charges: they poorly reflect incremental costs to the grid. A single household's peak usage is too small to cause significant system-wide costs. It is the aggregate peak usage that drives costs. These aggregate grid peaks correspond closely with time (see Figure 3) and poorly with individual demand peaks, which often occur outside of the system peak.

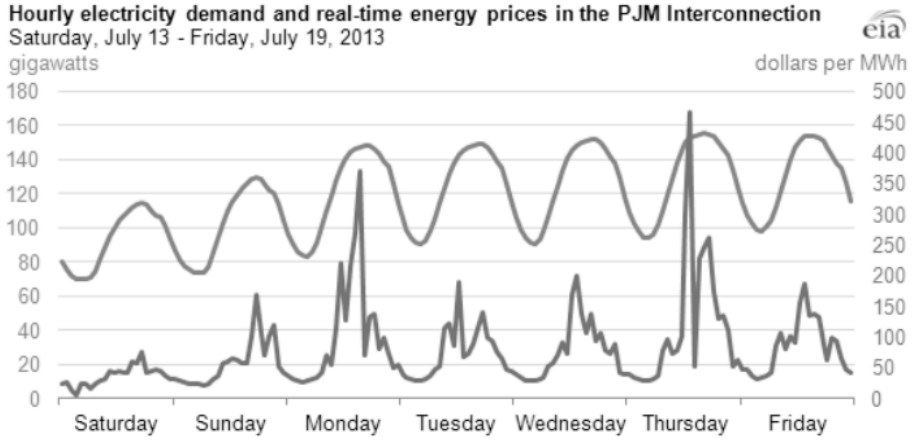


Figure 3. Aggregate usage in PJM and other organized markets typically tracks the time of day closely, but individual consumer peaks often vary.
EIA

Furthermore, the only things that utilities size according to demand from individual residential customers are the final line transformers and connecting secondary lines. These costs are small relative to those of generation and transmission capacity. And most of these capacity costs are sunk. By definition, sunk costs cannot be incremental. Using the cost-causation principle to justify demand charges to pay for sunk costs makes no sense; future usage behavior does not cause costs that have been sunk *[1]*.

This point is worth underscoring, for it exposes the contorted logic in advocating for demand charges as a means for recovering fixed costs. If fixed costs are truly as inescapable as many utilities want us

to believe, where would the bill savings promised by utilities come from if a customer actually responded to demand charges?

There are only three possibilities: they result from shifting costs to other customers (which is what demand charges are supposed to prevent); they stem from being first overcharged by utilities (akin to marking up items before offering a fantastic sale); or the customer was never expected to respond to demand changes and the savings opportunities were mere window dressing for demand charges. Whatever the scenario, none can be characterized as transparent, equitable, or efficient.

There is an important caveat. Demand charges, when carefully structured and targeted for specific customer segments, can incentivize behavior that helps avoid or defer future (not past) capacity investments, which indeed can lower costs for all. But even here proponents must reconcile two inconveniences.

First, this argument assumes that fixed costs are not necessarily inescapable, but are indeed variable in the long-run — a position identical to that of advocates for distributed generation. However, proponents of demand charges often downplay or outright deny this, especially as it relates to the value of distributed solar. One notable demand-charge proponent recently criticized net metering, saying: “I would never ask consumers to pay for [reductions in grid costs] that theoretically might be provided at some unpredictable time.” Yet this is the same ask from demand-charge advocates.

Second, and even more inconvenient, there are better pricing alternatives that can improve cost-recovery, are more readily understandable to consumers, and have yet to be widely implemented — namely, time-based rates (TBRs), including time-of-use (TOU) rates, variable peak pricing (VPP), critical peak pricing (CPP), or real time pricing (RTP).

It’s about time

Compared to demand charges, TBRs are far more precise in recovering costs and more flexible in tailoring prices according to customer preferences as well as the needs of the grid *[2].*

TBRs can be simple, such as TOU or seasonal rates, or more granular and sophisticated, such as CPP or RTP (see Figure 4). This flexibility and precision will be essential as the grid become more distributed and as customers expect different benefits from the grid at different times.

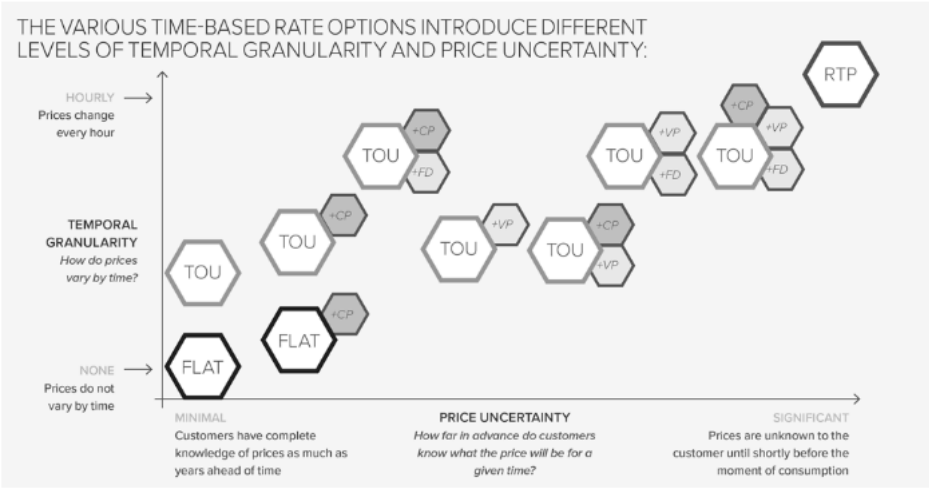


Figure 4. Different types of time-based rates can yield the same purported benefits as demand charges while being easier to understand, advocates argue.
Rocky Mountain Institute

More importantly, TBRs are far easier to understand. We regularly pay different prices at different times: peak minutes for cell phone services, matinee discounts for movies, higher airfares for peak travel time and dates, surge pricing for ride-sharing services, etc. Consumers are accustomed to paying more when the resources they want are scarce (and paying less when they are abundant). This is how most markets work.

Though regulation is supposed to replicate market forces, utility ratemaking has largely ignored the economic concept of scarcity (a concept so fundamental that it begins many an economic textbook). Flat electric rates that don't vary with time convey to customers that resources are equally available (or scarce) at all

times, which is hardly the case (again, see Figure 3). Inevitably, customers will consume and conserve energy at the wrong times. We should therefore not be surprised that too much energy is consumed during peak hours and too little at all other times to pay for the expensive peak capacity.

A better way to pay for that capacity is to charge customers more at times when it is in high demand. Paying a premium for premium times is far more understandable than paying demand charges *[3]*. And clearer pricing signals will better enable customers to avoid peak times and use technologies, such as solar and storage, to shift consumption times, or even relieve the grid of congestion.

Demand charges may have the opposite effect. To make demand charges more acceptable to the public, utilities often propose accompanying decreases in kWh rates. However, lower rates would further distort retail prices from actual costs that vary with time (again, see Figure 3) *[4]*. So even if individual peak usage may decrease, aggregate demand may actually increase during peak times. At the very least, lower rates will encourage overall energy consumption and counter efforts on energy efficiency and climate change.

Energy economists have long been advocating TBRs as a way to improve efficiency, flatten demand peaks, and lower grid costs. Furthermore, a recent analysis from the Lawrence Berkeley National Laboratory also suggests that TBR would improve fixed-cost recovery, increase solar integration, and help resolve differences over net metering.

We do not suggest that demand charges are categorically wrong. But they are wrong when they are broadly applied with little regards to the needs of the grid and the ability of customers to respond to them.

Moreover, demand charges alone cannot offer the same promise as TBRs, because they are less flexible and do not align with peak system demand. To be as effective, demand charges will have to be combined with some component of time. In any event, they will

require the same advanced metering infrastructure as TBRs. So why not try TBRs first?

If utilities are sincere about reducing grid costs, integrating new smart grid technologies, or creating a customer-centric industry (as they are looking to do), they should be asking for TBRs, not demand charges. Why hit customers with confusing and largely unproven pricing schemes, when TBRs provide a far more comprehensible and effective mechanism (see here and here, for instance) at achieving the same policy goals?

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[1] Many readers may object, arguing that customers' peak usage indeed create incremental costs because utilities must plan enough capacity to meet everyone's demand. This may be true for future capacity costs, but not capacity costs already incurred, i.e., sunk costs. Whether a customer uses 1kW or 5kW does not change the amount of sunk costs. Put it differently, if we were to assume future customer demand peaks cause sunk costs and charge customers accordingly, then any customer with lower-than-expected peaks could not be paying her fair share. Such a conclusion defies cost-causation principles, if not common sense.

[2] Some utilities have been pushing for demand charges that correspond with peak demand. This is essentially a variation of time-based pricing, the discussion of which is outside of the scope of this paper. While it has merits, it is very similar to, but less efficient than critical peak pricing, a pure time-based rate. For more information, see here.

[3] Clearly, we would want to protect vulnerable customers who cannot readily shift energy consumption for basic needs. But as we have written separately, the emergence of distributed energy resources is giving policymakers new options to empower customer to lower bills rather than rely on traditional methods of subsidizing rates.

[4] If we factor in the cost of pollution — particularly carbon emissions — the distortion of retail prices from actual costs would

be even more severe. Power plants that are dispatched to serve peak demand are far less efficient and pollute a lot more.

SOUTHERN PIONEER ELECTRIC COMPANY
Customer Cost Analysis

	Residental		Small
	General Use	**Space Heat**	**General Service**
O&M Expenses			
586 Oper. Meters	$263,348	$11,661	$65,999
597 Maint. of Meters	$727	$32	$182
902 Meter Reading	$31,211	$1,382	$7,822
903 Records & Collections	$880,234	$38,976	$220,600
905 Misc. Customer Accounts	$34,919	$1,546	$8,751
Total O&M	$1,210,440	$53,597	$303,355
Depreciation Expense			
Services	$36,214	$1,604	$8,690
Meters	$151,432	$6,705	$37,951
Total Depreciation	$187,646	$8,309	$46,642
Interest			
Services	$57,868	$2,562	$13,887
Meters	$241,983	$10,715	$60,645
Total Interest	$299,851	$13,277	$74,532
Margin			
Services	$19,071	$844	$4,577
Meters	$79,747	$3,531	$19,986
Total Margin	$98,818	$4,376	$24,562
TOTAL REVENUE REQUIREMENT	$1,796,756	$79,559	$449,091
No. of Customers	11,996	531	2,749
No. of Bills	143,950	6,374	32,987
Cost Per Month	$12.48	$12.48	$13.61

CERTIFICATE OF SERVICE

24-SPEE-415-TAR

I, the undersigned, hereby certify that a true and correct copy of the above and foregoing document was served by electronic service on this 2nd day of April, 2024, to the following:

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