BEFORE THE
STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Joint Application of Evergy Kansas Central, Inc., Evergy Kansas South, Inc., and Evergy Metro, Inc. for Approval to Make Certain Changes in their Charges for Electric Service	)))))	Docket No. 25-EKCE-294-RTS

DIRECT TESTIMONY
OF
LEONARDO R. GIACCHINO, Ph.D.

ON BEHALF OF

KANSAS GAS SERVICE
AND
BLACK HILLS ENERGY / KANSAS GAS UTILITY COMPANY

June 6, 2025

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I. INTRODUCTION AND QUALIFICATIONS

Q: Please state your name, employer, and business address.

A: My name is Leonardo Giacchino, Ph.D. I am a partner at Solutions Economics LLC. My business address is 5615 Northfield Road, Bethesda, Maryland 20817.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of Kansas Gas Service, a division of ONE Gas, Inc. ("Kansas Gas Service") and Black Hills/Kansas Gas Utility Company, LLC, d/b/a Black Hills Energy ("Black Hills"), jointly referred to herein as the "Gas Utilities."

Q: Please explain the job responsibilities and duties in your current position.

A: As a partner with Solutions Economics, I provide economic and financial analyses and advisory services in regulatory matters, litigations, and arbitrations. Over the course of more than 30 years, I have worked in over 30 countries on more than 100 projects that have addressed economic and regulatory issues for U.S. and international businesses, investors, governments, and organizations.

Q: Please describe your educational background and relevant work experience.

A: I obtained a Bachelor of Science degree in Economics from the Universidad Católica Argentina. I then obtained both my M.A. and Ph.D. degrees in Economics from Duke University. My experience includes: providing opinions on regulatory economics issues; performing demand, tariff, pricing, and cost studies; developing business plans for new regulatory agencies in several countries; conducting due diligence and feasibility studies for power plants, utilities, and pipelines; developing network models for the energy industry; calculating damages and compensation estimates; helping negotiate tariff adjustments and regulatory reform with legislators and regulators; and providing opinions on contract disputes. I have also worked at two oil and gas companies, previously to obtaining a Ph.D, in the business development area and I was in charge of the development of a 100 MW combined-cycle gas combustion turbine to feed electricity to four oil and gas fields. My CV is attached to this testimony as **Exhibit LRG-001**.

Q: Have you ever testified before a regulatory agency?

A: Yes. Most recently, I testified in Commonwealth Edison Company's revenue-neutral rate design proceeding before the Illinois Commerce Commission ("ICC") in ICC Docket No. 24-0378, on behalf of ICEA-RESA, dealing with the allocation of costs for default rates. This year I also testified in Ameren Illinois Company's revenue-neutral rate design proceeding before the ICC in ICC Docket No. 25-0083, dealing with the cost allocation factors from the Functionalization, Classification and Allocation steps. I have also testified as an expert in domestic and international courts in matters related to the electric industry. As a regulatory economics expert in the electric industry, I have testified before the Federal Energy Regulatory Commission related to the cost allocation of Entergy Electric Utilities across several Southern states, in investment arbitration cases at the International Centre

for Settlement of Investment Disputes, in commercial arbitrations at the International Chamber of Commerce and before regulatory commissions in some U.S. states, Argentina, Bolivia, Brazil and Peru. A list of representative matters in which I have testified is included in **Exhibit LRG-001**.

II. PURPOSE OF TESTIMONY

Q: What is the purpose of your testimony?

A: This Commission has recognized in previous rate cases the importance that electric rates be cost based and not include artificial incentives, or cross subsidies to encourage a customer to switch end-use equipment. The purpose of my testimony is to identify cross subsidies in the general rate case filed by Evergy Kansas Central ("EKC") and Evergy Kansas South ("EKS"), jointly referred to as "Evergy," and assigned Docket No. 25-EKCE-294-RTS by the State Corporation Commission of the State of Kansas ("KCC"), particularly with respect to Time of Use ("TOU") rates that would be contrary to the Commission's previous holding[1].

III. FILES AND DOCUMENTS USED

Q: What files and documents did you use to prepare this testimony?

A: I have reviewed Evergy's filing and responses to data requests, as well as used books and articles relevant to regulatory economics issues.

IV. IDENTIFICATION OF EXHIBITS

[1] Order Dated November 22, 2010, Docket No. 10-KCPE-415-RTS, page 125.

Q: Do you support any schedules in support of your testimony?

A: Yes. I am including the following Exhibits to support this testimony:

- **Exhibit LRG-001**: CV of Dr. Leonardo Giacchino, Ph.D.;
- **Exhibit LRG-002**: Expanded Excel Spreadsheet "Exh LRG-010 – Expanded 2024.01.28 C_I Rate Design.xlsx" which adds additional calculations to Evergy produced file "2024.01.28 C_I Rate Design.xlsx;" and
- **Exhibit LRG-003**: Nisa Hunt, "Unlocking Data Center Sustainability with Energy-Efficient Delta Cube³ Cooling Technology," Neutrality Data Centers, undated.

V. ORGANIZATION OF TESTIMONY

Q: How is the rest of your direct testimony organized?

A: In the rest of the testimony, I present two sources of cross subsidies I have identified in Evergy's filing. Finally, I present my conclusions.

VI. SUMMARY OF FINDINGS

Q: What are the main findings of your review?

A: After the review of files and documents provided by Evergy, I have been able to locate two sources of cross subsidies impacting residential and commercial customers. For residential customers, Evergy's CCOS reduces the monies allocated to residential customers. While residential subsidies are routinely seen in CCOS models and resulting rate designs, it is important that rates for competitive services (i.e., areas where gas and electric utilities compete) do not unfairly price one choice over another. Electricity for competitive end uses should be priced fairly, and not be subsidized from end uses where Evergy faces no competition. For commercial customers, the subjective, non-scientific and biased methodology used by Evergy's consultant, the Brattle Group ("Brattle") to calculate TOU rates impacts their reliability. My testimony highlights some areas of concern so the

Commission can make an informed decision about Evergy's proposed cost allocation model and resulting rate designs.

VII. EVERGY'S MODEL HIGHLIGHTS THE CROSS SUSBSIDY

Q: Are Evergy's residential customers being subsidized with lower rates from the other customer classes?

A: Yes.

Q: How did you determine this?

A: The results of the model itself indicate that residential customers are being subsidized by Evergy's other classes. As Ms. Miller testifies on page 15 of their testimony, and as "Cost Allocation" tab on Evergy's model shows, the relative rate of return for residential customers is 2.19%, which is lower than the relative rate of return for the overall system of 5.43%. In response to Data Request 10 made by HF Sinclair, Evergy provided an updated and corrected CCOS model which resulted in a lower relative rate of return for the residential class of 2.14%.

Q. Is it inherently wrong for there to be a residential subsidy?

A. Not necessarily. A CCOS model is a snapshot in time and reflects how customers are contributing to their costs at that particular moment. Likewise, the presence and degree of a subsidy depends on *how* costs are allocated and who pays for it. There is no one perfect method for allocating costs. Since CCOS models influence how rates are designed it is important that this starting point not create unfair competitive advantages in areas where utilities compete. For electric and gas utilities, this is easily seen in residential customers. Both compete for space heating, water heating, and cooking demands.

Q: What analyses have you conducted to identify this first source of cross subsidies?

A: I have analyzed Evergy's COSS model using as a framework the regulatory economics literature, such as Chapter 7 in Lesser, Jonathan; and Giacchino, Leonardo (2024): "Fundamentals of Energy Regulation," Third Edition (Paperback), Regulatory Economics Publishing, Bethesda, Maryland ("Lesser and Giacchino"), and allocation methods and best regulatory practice as those included in National Association of Regulatory Utility Commissioners (1992): "Electric Utility Cost Allocation Manual," NARUC, Washington, DC, January (the "NARUC Manual").

Q: Please describe how you conducted your analyses.

A: I have reviewed Evergy's model for the three steps in the allocation of costs to customer classes for rate-making: (1) Functionalization (allocation between regulated and unregulated functions); (2) Classification (allocation into fixed – demand, variable – energy, and customer costs): and (3) Allocation (allocation to customer classes). In Evergy's model, tabs "Functional Cost Codes," "Rate Base," "Payroll," and "Unbundled RR" deal mainly with Functionalization and Classification while Tabs "Allocation Factors" and "Cost Allocation" deal mainly with Allocation. I reviewed whether Evergy implements each step.

Q: What is your main finding?

A: Evergy calculates the rate of return at present rates in its CCOS model in the Tab "COS Summary" and the rate of return for residential customers is 2.14% at present rates which is well below the overall return of 5.43% at present rates. This indicates that not enough costs and rate base has been allocated to residential customers and their revenue

requirement has been underestimated. Evergy's own CCOS model shows current residential rates are being subsidized by other customer classes.

VIII. BRATTLE'S TOU RATES ARE NOT JUST AND REASONABLE AND ALSO CREATE CROSS-SUBSIDIES

Q. How were the time-of-use ("TOU") rates shown in Table 1 of Mr. Lutz's testimony developed?[2]

A. As Mr. Lutz states, Evergy hired Brattle "to determine the rate design and pricing for the Company based on design details formulated through the Customer Group meetings."[3] The Brattle Group report, "Design Considerations for an Optional Commercial and Industrial TOU Rate in Evergy's Kansas Central Territory" ("Brattle Report"), is attached to his testimony as Exhibit BDL-1.

Q. Can you summarize the problems with the Brattle Report?

A. Yes. There are five problems. First, Brattle's analysis is neither transparent nor reproducible. Consequently, it suffers from fundamental flaws, bias and errors, such that the proposed rates are not revenue-neutral.

Second, Brattle uses an assumed value for generation capacity costs in 2028 that was provided by Evergy as part of the Missouri Energy Efficiency Investment Act Cycle 4, as part of another consultant's report that was prepared for Evergy.[4] The basis for this avoided generation cost value is never explained and its accuracy cannot be determined, therefore, it cannot be independently replicated.

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2 Lutz Direct, at 7:8-9.
3 *Id*. at 5:20-22.
4 Applied Energy Group, Inc., Evergy 2023 DSM Market Potential Study," May 15, 2023, https://efis.psc.mo.gov/Document/Display/781680, last visited June 4, 2025..

Third, the locational marginal prices ("LMPs") used by Brattle do not reflect actual market conditions.[5] Not only do different locations have different LMPs and, hence, different impacts on cost allocation, but Brattle did not use the actual, market-clearing LMPs. Instead, Brattle used day-ahead LMPs ("DA LMPs"), which differ significantly over the test year from the real-time LMPs ("RT LMPs") that represent the true market prices.

Fourth, Brattle created a methodology, which it calls the "Delta cubed methodology", to allocate generation costs by hour. This method is arbitrary and lacks any basis in the literature on cost allocation.

Fifth, Brattle uses arbitrary assumptions to obtain energy and fixed charges for TOU rates that create subsidies across the same customer classes.

Q. Did you review the underlying analysis Brattle performed?

A. Yes. Data Request Gas Utilities_10 requested the data used by Brattle and its workpapers. These workpapers reveal numerous inconsistencies in the analysis. Moreover, in many places, formulas have been replaced with pasted values, preventing me from evaluating the calculations.

Q. Focusing on the first problem identified with the Brattle analysis, is this analysis transparent and reproducible?

A. No. As I explain below, I have been unable to identify the sources of numerous pasted values in the different Tabs (also known as worksheets). Hence, the study results are not

[5] "WR" refers to "Western Resources," which became Westar Energy before the company merged with Great Plains Energy in 2019.

only based on arbitrary assumptions, as I discuss below, but many of the results cannot be gleaned from the workpapers.

Q. Brattle claims that the TOU rates it designed are revenue-neutral. Do you agree?

A. No. Brattle did not perform any analysis to determine the impacts of the TOU rates on changing customer behavior, which Brattle admits is a primary reason for the proposed rates.[6] Instead, Brattle simply asserts that the impacts of the proposed TOU rates are revenue-neutral. Yet, if the primary purpose of the TOU rates is to "enhance Evergy's ability to leverage demand flexibility, and promote efficient use of the company's power system with the overall objective of lowering system costs for customers,"[7] then an analysis of the estimated impacts should have been forthcoming. Instead, Brattle simply asserts that the proposed TOU rates are revenue-neutral and recommends that Evergy monitor the impacts of the proposed TOU rates to determine their effects.

Evergy witness Mr. Lutz appears to be preparing for this, noting that Evergy may need to seek relief through an Accounting Authority Order or some other mechanism if the revenue impact from these rates is larger than expected.[8]

Q. What revenues did Brattle use as the basis for designing these supposedly "revenue-neutral" rates?

A. That is unclear, and another reason to doubt the veracity of the Brattle analysis. Specifically, the class revenues referenced in the Brattle analysis workpapers do not match the revenues shown in the Evergy proposed CCOS. For example, for Medium General

6 Brattle Report, p. 2.
7 *Ibid*.
8 Lutz Direct, p. 10, ll. 8 – 10.

Service ("MGS") class in the workpaper spreadsheet, "2024.01.28 C_I Rate Design.xlsx," Tab "Class Revenues," Billed Revenues are shown to be $153,501,214 (cell F10). That value, along with every other class revenue value in this Tab, is a pasted value from elsewhere. The MGS billed revenue value appears to originate from another Tab, "2025.01.28 COS Summary.xlsx," Tab "MGS," where this same value can be found in cell T20. However, as this Tab shows, the Production, Transmission, Distribution, and Customer costs allocation percentages for MGS, shown in cells I9 – I14, are shown to be based on Evergy's 2022 COSS (Cell C3), not the current cost of service study. Clearly, the TOU rates should be based on the current proposed CCOS spreadsheet. Otherwise, there is no chance that the proposed TOU rates are revenue-neutral.

In the spreadsheet, "2025.01.16 AMI Billing Determinants.xlsx," Tab "MGS," total revenues for the test year are shown to be $239,662,639 (cell O142), including the various Evergy surcharges. The total of the customer charges, demand charges, and energy charges is $145,694,601 (equal to the sum of cells O75 – O85). Furthermore, the billed revenue values in the various Tabs (e.g., MGS, LGSD, LGSSLR, LGSSECD, etc.,) are all pasted values.

The Evergy CCOS spreadsheet, "Evergy (KS Central) 2025 CCOS model – DIRECT FINAL. xlsx," Tab "COS Summary," shows revenues of $153,953,501. Thus, there are at least three different total revenue values for the MGS class:

1) $153,501,214 in 2024.01.28 C_I Rate Design.xlsx;"
2) $145,694,601 in 2025.01.16 AMI Billing Determinants.xlsx; and
3) $153,953,501 in Evergy (KS Central) 2025 CCOS model – DIRECT FINAL.xlsx.

Having three different values for the MGS revenue requirement, no consultant can conclude that the proposed TOU rates are revenue-neutral. Therefore, while Brattle may

have designed what it deems "revenue-neutral rates," their proposed TOU rates were designed based on the revenues of 1) and 2) above, which are below the revenue requirement proposed in 3). Given that the design revenue requirements in 1) and 2) for MGS are below the CCOS revenue requirement for MGS, the TOU rates from the design under collect the required revenue and those rates are then below what they should be.

Q. Were you able to identify the source(s) of the billed revenue values in the various Tabs in the spreadsheet "2025.01.16 AMI Billing Determinants.xlsx?"

A. No.

Q. With respect with the second identified problem with the Brattle analysis, what value does Brattle assume for the cost of generation capacity?

A. According to the report, Brattle assumes that generation capacity costs are $118/kW-year.

Q. Does Brattle identify the source of that assumed generation capacity cost?

A. Yes. According to the report, that value represents the 2028 avoided capacity cost from Missouri Energy Efficiency Investment Act ("MEEIA") Cycle 4.[9] Documents for MEEIA Cycle 4 are posted on the Midwest Energy Efficiency Alliance ("MEEA") website.[10] There, one can find filings made by Evergy Missouri, specifically, the filing made by Evergy Missouri on April 29, 2024, with the Missouri Public Service Commission.[11]

One of those documents is Appendix 8.8, the "Evergy 2023 DSM Market Potential Study, which was prepared for Evergy Missouri by Applied Energy Group, Inc."[12]

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[9] Lutz Direct, footnote 6.

[10] https://www.mwalliance.org/blog/missouri-energy-efficiency-dis-investment-actions-meeia-cycle-4-dockets, last visited June 4, 2025.

[11] Op. cit., **footnote 4**.

[12] Available at: https://efis.psc.mo.gov/Document/Display/781680, last visited June 4, 2025.

According to that report, Evergy Missouri provided the generation avoided cost value.[13] The MEEIA Cycle 4 Report states that Evergy developed these from its 2024 IRP.[14] However, the portion of the Evergy IRP that contains the avoided cost development is confidential. Therefore, it cannot be replicated without access to the confidential data in the IRP.

Q. Does it make sense to use an estimate of avoided generating capacity costs in 2028 to establish TOU rates?

A. No. It is unclear how using a forecast value of avoided generating capacity in 2028 is relevant to establishing TOU rates today. There is no economic rationale in that Brattle assumption. Brattle states that this generating capacity cost is assigned "across the top system load hours, such that generation costs are higher during hours where there is greater load and therefore less surplus generation capacity."[15]

Q. Does Brattle identify the top system load hours to which it allocates the assumed generating capacity costs?

A. No. Brattle does not identify how many hours constitute the "top system load hours." Indeed, Brattle allocates some costs among the top 500 hours of commercial and industrial ("C&I") loads, and other costs to the top 200 hours of total system loads. Moreover, because Evergy is part of SPP, high-load hours, such as on a hot summer day, may have lower energy costs because of large quantities of wind and solar generation that are being added to SPP, including generation that Evergy itself intends to construct, based on its most

[13] *Id*., p. 25, Table 2-14.
[14] MEEIA Cycle 4 2025-2028 Filing, April 29, 2024, p. 12. https://efis.psc.mo.gov/Document/Display/781683, last visited June 4, 2025.
[15] Brattle Report, p. 7.

recent IRP. Hence, the calculation by Brattle cannot be replicated because it is not included in the workpapers

Q. For the third problem with the Brattle Report, how does Brattle assign energy costs?

A. Brattle states that it used locational marginal prices ("LMPs") from the "WR-WR" trading hub in SPP because it is closest to Evergy Kansas Central's service territory. Brattle claims that the assigned energy costs align with hourly energy LMPs. Brattle also states that it designs the energy charge "to recover variable generation costs and all generation capacity costs other than those assigned to the 200 peak system load hours."[16]

Q. Did Brattle use real-time LMPs that reflect actual market conditions in SPP?

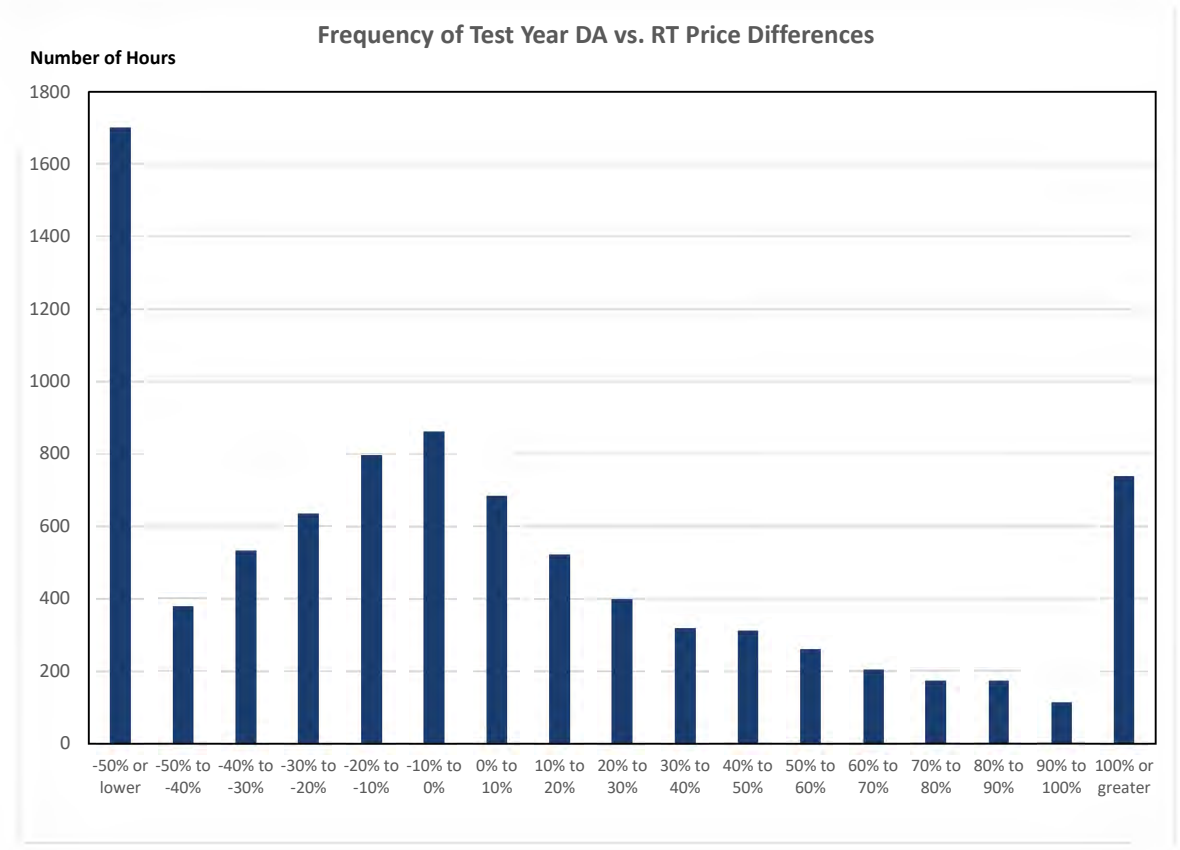
A. No. Brattle used Day Ahead ("DA") LMPs. DA LMPs are clearing prices based on forecast conditions the next day. DA LMPs do not account for the inherent uncertainty in actual supply and demand conditions, forced outages, transmission system conditions, and so forth.

Q. Are the differences between the WR-WR DA-LMPs and the RT-LMP's significant?

A. Yes. The chart below illustrates the percentage differences between DA LMPs and Real Time ("RT") LMPs at the WR-WR node over the test year, using the data provided in the spreadsheet "2024.01.28 C_I Rate Design.xlsx," Tab "WR_WR LMP." As the chart shows, there were approximately 1,700 hours when the RT LMPs were more than 50% *lower* than the DA LMPs. There were almost as many hours (1,655) when the RT LMPs were more than 50% *higher* than the DA LMPs. In over 700 hours, the RT LMPs were more than double (100% greater) than the DA LMPs. In fewer than 20% of the hours were

[16] *Id*., p. 10.

the DA and RT prices within 10% of each other. Thus, Brattle's reliance on DA LMPs fails to represent actual market conditions.



Source: Tab "Chart 1." **Exhibit LRG-002**.

Moreover, as the Brattle Report notes, Evergy collects a portion of energy costs through a separate rider, specifically the Retail Energy Cost Adjustment Rider. Thus, whereas the allocation of the energy portion of the TOU charges is based on DA LMPs, the TOU energy charge is not. Finally, the correlation between the hourly DA LMPs and the RT LMPs over the test year is only 58.9%. Thus, the DA LMPs should not be used as a proxy for the RT LMPs.

Q. To explain the fourth problem in the Brattle Report, how does Brattle assign system costs to the peak, off-peak, and super off-peak times?

A. Brattle states that it uses what it terms the "Delta cubed methodology" or "delta load cubed" method.[17] This allocator assigns costs in each hour based on the cube of the difference between load in a given hour and the lowest hourly load during the test year, divided by the sum of the cubed differences over all 8,760 hours of the test year.

Q. Does Brattle explain why they use this "delta load cubed" approach?

A. Yes. Brattle states that, "By cubing the load difference in each hour, we assign a greater weight to the highest load hours."[18]

Q. Do you agree with this approach?

A. No. First, I have never heard of using the cube of load differences to allocate costs and there is no reference to it in the literature, including the NARUC Manual. Instead, the only references I can find to "Delta Cubed" refer to a cooling technology for data centers.[19] Although I agree that costs are not necessarily linear, the choice by Brattle to use an allocator based on cubed differences is arbitrary.

For example, the workpaper spreadsheet, "2024.01.28 C_I Rate Design.xlsx," Tab "Allocations," shows the allocations of costs to the Summer Peak, Summer Off-peak, Summer Super Off-peak, Winter Off-peak, and Winter Super Off-peak periods. By changing the exponent, one can derive different cost allocations, as shown in **Table *1*** below:

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[17] *Ibid*.
[18] *Id*., p. 11.
[19] See Nisa Hunt, "Unlocking Data Center Sustainability with Energy-Efficient Delta Cube³ Cooling Technology," Neutrality Data Centers, undated. **Exhibit LRG-003**.

Table 1: Cost Assignment Summary, Alternative Delta Load Approaches

Season	Period	Delta Load		
		Squared	Cubed	Fourth Power
Summer	On-Peak	9.2%	11.3%	11.8%
Summer	Off-Peak	38.5%	40.3%	37.5%
Summer	Super Off-Peak	5.6%	3.9%	2.5%
Winter	Off-Peak	27.6%	16.0%	8.9%
Winter	Super Off-Peak	3.0%	1.3%	0.6%
All	Demand	16.1%	27.3%	38.8%
Total		**100.0%**	**100.0%**	**100.0%**

Source: cells M27:Q35, Tab "Calculation Summary. **Exhibit LRG-002**.

As this table shows, changing the methodology changes the allocations, especially the demand allocation. For example, cubing the load differences allocates 27.3% of costs to summer demand. But if the allocation is based on squaring the load differences, then only 16.1% of the costs are assigned to Summer Demand. If, on the other hand, the methodology raises the load differences to the fourth power, then 38.8% of costs are assigned to Summer Demand. The point is that, by changing the way load differences are weighted, the cost allocations can be changed arbitrarily.

Q. Does Brattle offer any justification for its use of the cube of the load differences to allocate generation capacity costs to the different time periods?

A. No.

Q. On the fifth and final set of problems with the Brattle Report, does Brattle explain why it set the demand charge based on costs assigned to the top 200 hours of highest system load?[20]

A. Brattle states that "The top 200 hours are selected to reflect that system conditions during the highest load hours of the year are incrementally larger drivers of capacity costs than conditions in other hours of the on-peak period."[21] Here again, the choice is arbitrary. Brattle could have chosen the top 100 hours or 300 hours, or something else. Moreover, assigning demand costs based on overall system peak loads to the first 200 hours, while assigning distribution-related costs to the top 500 hours of commercial and industrial load, is inconsistent.

Q. Did Brattle identify the "system conditions" that are different in the top 200 hours versus other peak hours?

A. No.

Q. How does Brattle assign distribution system costs?

A. Brattle states that it assigns 25% of total distribution costs to the top 500 commercial and industrial load hours across the year.[22] Both the percentage cost assignment and the number of hours to which those costs are assigned are arbitrary. Brattle offers no justification for selecting these specific parameters. Moreover, it ignores the fact that the Evergy distribution system is designed to meet the highest system peak loads, not just the highest loads of commercial and industrial customers. Hence, it may be that higher

[20] Brattle Report, p. 11.
[21] *Ibid*.
[22] *Id*., p. 7.

residential load hours occur when commercial and industrial loads are lower, driving additional distribution system investment.

Q. Does Brattle state the reasons for assigning this specific percentage of costs and why it assigns them to the top 500 hours?

A. No. Brattle simply states that "This method reflects that distribution capacity investment needs are local in nature, often driven by clusters of similar customer types, and can vary significantly in their timing across the service territory. The method ensures that hours with higher class load are assigned a greater proportion of distribution costs."[23]

Q. Does Brattle account for residential loads that may be driving distribution costs during these same hours?

A. No.

Q. Does Brattle provide any evidence that Evergy's distribution costs are "driven by clusters of similar customer types"[24]?

A. No.

Q. Is there evidence that the rates derived are not revenue-neutral?

A. Yes. Brattle acknowledges that the customer charges are too high because the fixed-cost customer revenue requirement is too high. For example, in the spreadsheet "2024.01.28 C_J Rate Design.xlsx," Tab "Calculation Summary," the MGS customer revenue requirement is shown as $505,210 (cell G13), versus the Total Fixed Charge Collection amount of $2,186,460 shown in Tab "Customer" (cell H13). Similar results hold for the

[23] *Ibid*.
[24] *Ibid*.

LGS categories; all reveal that the customer charge is too high.[25] The over-collection amounts are accounted for by reducing the energy charges shown in G101 – G105.

Q. What do you conclude about the Brattle study and the proposed TOU rates?

A. Many of the assumptions and cost assignments are arbitrary, such as Brattle's use of its "Delta Load Cubed" methodology, while other aspects of the analysis, such as using DA-LMPs, are incorrect. There is no basis for concluding the rates are revenue-neutral, as Brattle claims, because Brattle failed to analyze the potential impacts on C&I consumption changes (both temporal and in absolute terms).

Q. Do you recommend that the Commission reject the proposed TOU rates in their entirety?

A. Yes.

IX. CONCLUSIONS

Q: Can you summarize your findings for the Commission?

A: Yes. I have reviewed the filing by Evergy and found that its CCOS model shows residential customers are being subsidized by Evergy's other customer classes. While this is not necessarily unexpected, Evergy has not taken any meaningful step to address this subsidy

[25] This can be seen by changing the rate class shown in call D6 of Tab "Calculation Summary" and examining the value in cell G22.

for customers who have alternative energy choices. Likewise, Evergy's consultant (Brattle) report is not transparent, not replicable, and laden with errors.

Q. Do you have any recommendations for the Commission?

A. Yes. I recommend the Commission reject Evergy's CCOS study and take steps to address the current subsidy being provided to residential customers. In addition, I recommend the Commission reject the proposed optional TOU rates for commercial and industrial customers.

Q: Does this conclude your testimony?

A: Yes, it does.

VERIFICATION

STATE OF MARYLAND
COUNTY OF MONTGOMERY, ss:

I, Leonardo R. Giacchino, being first duly sworn on oath, depose and state that I am the witness identified in the foregoing Direct Testimony; that I have read the testimony and am familiar with its contents; and that the facts set forth therein are true and correct.

Leonardo R. Giacchino

SUBSCRIBED AND SWORN to before me this 3rd day of June, 2025.

Notary Public

Appointment/Commission Expires: 12/13/2026

PELAGIE TRAORE
Notary Public
Montgomery County
Maryland
My Commission Expires Dec. 13, 2026

Leonardo R. Giacchino, Ph.D.
Partner

Summary of Experience

Dr. Leonardo R. Giacchino provides economic and financial analyses and advisory services in litigations, arbitrations, and regulatory matters. Over the course of more than 30 years, he has worked in more than 40 countries on over 100 projects that have addressed economic and regulatory issues for U.S. and international businesses, investors, governments, and organizations. He has calculated damages and compensation estimates; helped negotiate tariff adjustments and regulatory reform with politicians and regulators; provided opinions on contract disputes; performed demand, tariff, pricing, and cost studies; developed business plans for new regulatory agencies in several countries; conducted due diligence and feasibility studies for power plants, utilities, and pipelines; and developed network models for the energy industry. Dr. Giacchino has vast experience in regulated industries such as the natural gas, electricity, oil, mining, water, transport and milk industries. He has also worked on many unregulated industries.

Dr. Giacchino has provided testimony in numerous forums; these include FERC, U.S. federal district court, US states courts, Mexico's Federal Court, South Africa's High Court, the London Courts of International Arbitration (LCIA), the International Centre for Settlement of Investment Disputes (ICSID), the International Chamber of Commerce (ICC), the American Arbitration Association (AAA), the International Centre for Dispute Resolution (ICDR), the International Arbitral Centre of the Austrian Federal Economic Chamber and the Armed Services Board of Contract Appeals (ASBCA). He has participated as expert in proceedings before public utility commissions in Argentina, Australia, Bolivia, Brazil, Guatemala, Mexico, Peru, and the United States.

Dr. Giacchino is Adjunct Professor at the Washington College of Law (American University) where he teaches damages in international arbitration. Dr. Giacchino is a former faculty member at the PURC/World Bank International Training Program on Utility Regulation and Strategy, University of Florida, Public Utility Research Center and previously taught economics at Duke University and at Universidad Católica Argentina. He was Vice President at NERA and a Partner at Bates White, where he provided economic analysis and advisory services in regulated markets. He served as Senior Economist at a private oil and natural gas company in Argentina and worked at another. In his work at the oil and gas companies, he coordinated project evaluations of oil field auctions, renegotiated contracts with the state owned companies, directed research in international energy markets, and participated in planning for the deregulation of energy markets in Argentina. He has an extensive background in microeconomics, regulation, finance, modeling, econometrics, international trade and finance, and macroeconomics. He is also

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the coauthor (with Dr. Jonathan Lesser) of *Fundamentals of Energy Regulation*, published in 2007 (first edition), 2013 (second edition) and 2019 (third edition) by Public Utilities Reports, Inc. (PUR) and 2024 (third edition paperback) and 2025 (forthcoming fourth edition) by Regulatory Economics Publishing, LLC. He also coauthored *Principles of Utilities Corporate Finance*, also published by PUR in 2011. He is in the Editorial Board of the Journal of Damages in International Arbitration. He is listed in Who's Who Legal as one of the world's top international arbitration experts.

Areas of Expertise

- Competition
- Contract negotiations
- Costing practices
- Damages Estimation
- Due diligence
- Electricity
- Energy
- International arbitration
- International economics
- Macroeconomics
- Market power and market valuation analysis
- Milk
- Natural Gas
- Oil
- Policy recommendations
- Price and rate design
- Privatization
- Regulatory policy and market design
- Regulatory strategy
- Restructuring
- Transport
- Valuation
- Water

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Selected Expert Testimony

Advent Morro

- *Puerto Rico State Court, Guayacán Private Equity Fund Limited Partnership and Venture Capital Fund Inc. v. Medical Card Systems Inc.,* Civil Case Docket No. SJ2022CV03261

  Subject: Fair Value Calculation of MCS in the Merger with Kinderhook

  - Deposition: May 16, 2025
  - Rebuttal Expert Report, April 21, 2025.
  - Expert Report, March 24, 2025.

ICEA and RESA

- *State of Illinois, Illinois Commerce Commission, Ameren Illinois Company, Proposed Revenue-Neutral Rate Design Pursuant To Section 16-105.5 of the Public Utilities Act,* Docket No. 25-0083

  Subject: Proper Allocation of Costs between the Supply and Delivery Function

  - Expert Report, February 17, 2025.

ICEA and RESA

- *State of Illinois, Illinois Commerce Commission, Commonwealth Edison Company, Revenue neutral tariff changes related to rate design*, Docket No. 24-0378

  Subject: Proper Allocation of Costs between the Supply and Delivery Function for ComEd's Default Services

  - Rebuttal Expert Report, September 16, 2024.
  - Expert Report, July 24, 2024.

Republic of Peru

- *Vinci Highways SAS and Vinci Concessions SAS v. Republic of Peru*, ICSID Case No. ARB/21/60

  Subject: Macroeconomic Impact from the Construction of Highway Línea Amarilla in Lima, Peru.

  - Rebuttal Expert Report, February 7, 2025 (with Ralph Koch, Delta Consulting).
  - Expert Report, February 26, 2024 (with Ralph Koch, Delta Consulting).

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Oil Company

- *United States District Court, District of Puerto Rico, Civil Action No: 20-1591*

  Subject: Economic Impact from the Amendments to Law No. 60 related to the wholesale and retail sale of petroleum products in Puerto Rico.

  - Deposition, April 24, 2024.
  - Supplemental Expert Report, December 22, 2023.
  - Expert Report, October 23, 2021.

Food Processor

- *ICDR Case NO. 01 20 0014-8047409*

  Subject: Calculation of Damages due to a breach of contract for the provision of a sea water desalinization plant.

  - Expert Report, December 16, 2021.

National Energy Regulator of South Africa

- *High Court of South Africa, Gauteng Division, Pretoria, Case No: 51550/2021*

  Subject: Regulatory economics nature of the revenue requirement.

  - Affidavit, November 23, 2021.

Water Bottler

- *United States District Court, District of Puerto Rico, Case No: 18-1414 (DRD)*

  Subject: Damages calculation (disgorgement of profits) as a result of infringement of marks.

  - Deposition, June 4, 2024.
  - Rebuttal Expert Report, February 23, 2024.
  - Deposition, February 6, 2023.
  - Expert Report, August 30, 2022.
  - Unsworn Affidavit, November 23, 2021.
  - Unsworn Affidavit, October 22, 2021.

Fragrances and Cosmetics Distributor

- *ICC* Case No. 25149/MK/PDP

  Subject: Damages calculation relative to an exclusivity distribution agreement in Brazil.

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- Direct Oral Testimony, November 11, 2021.
- Expert Report, August 2, 2021.

Suiza Dairy Inc.

- *The Financial Oversight and Management Board for Puerto Rico as Representative of the Commonwealth of Puerto Rico v. Debtors*, PROMESA Title III, Case No. 17 BK 3283-LTS

  Subject: Amount owed by the Government of Puerto Rico from a Federal Court Judgment related to a regulatory taking.

  - Unsworn Affidavit, June 15, 2021.

Bank Shareholder

- *ABCI Investments Limited v. Republic of Tunisia*, ICSID Case No. ARB/04/12

  Subject: Damages and compensation from four violations as determined by the Tribunal in its Decision on Liability in an investment in the banking industry.

  - Direct Oral Testimony, November 15, 2022.
  - Supplementary Submission, September 16, 2022.
  - Rebuttal Report, May 30, 2022.
  - Expert Report, May 20, 2020.

Suiza Dairy Inc

- Oficina de la Reglamentación de la Industria Lechera (Puerto Rican Milk Regulator)
  - Expert Report, August 29, 2024. Subject: Regulatory Accrual Collected by Suiza Dairy as of December 31, 2023 (written in Spanish).
  - Expert Report, August 26, 2024. Subject: Determination of the 2025 regulated margin for fresh milk processors using 2023 data (written in Spanish).
  - Expert Report, August 26, 2024. Subject: Determination of the 2025 regulated margin for UHT milk processors using 2023 data (written in Spanish).
  - Expert Report, August 1, 2023. Subject: Determination of the 2024 regulated margin for fresh milk processors using 2022 data (written in Spanish).
  - Expert Report, August 1, 2023. Subject: Determination of the 2024 regulated margin for UHT milk processors using 2022 data (written in Spanish).
  - Expert Report, August 1, 2023. Subject: Regulatory Accrual Collected by Suiza Dairy as of December 31, 2022 (written in Spanish).

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- Expert Report, April 29, 2022, revised on May 11, 2022 and final revision on January 3, 2023. Subject: Determination of the 2023 regulated margin for fresh milk processors using 2021 data (written in Spanish).
- Expert Report, April 29, 2022, revised on May 11, 2022 and final revision on January 3, 2023. Subject: Determination of the 2023 regulated margin for UHT milk processors using 2021 data (written in Spanish).
- Expert Report, April 29, 2022, revised on May 11, 2022 and final revision on January 3, 2023. Subject: Regulatory Accrual Collected by Suiza Dairy as of December 31, 2021 (written in Spanish).
- Expert Report, October 11, 2021, revised on June 5, 2024, November 14, 2024 and final revision on February 11, 2025. Subject: Determination of the 2022 regulated margin for fresh milk processors using 2020 data (written in Spanish).
- Expert Report, October 8, 2021, revised on June 5, 2024, November 14, 2024 and final revision on February 11, 2025. Subject: Determination of the 2022 regulated margin for UHT milk processors using 2020 data (written in Spanish).
- Expert Report, October 8, 2021, revised on June 5, 2024, November 14, 2024 and final revision on February 11, 2025. Subject: Regulatory Accrual Collected by Suiza Dairy as of December 31, 2020 (written in Spanish).
- Expert Report, January 9, 2021. Subject: Determination of the 2021 regulated margin for UHT milk processors using 2019 data (written in Spanish).
- Expert Report, January 8, 2021. Subject: Determination of the 2021 regulated margin for fresh milk processors using 2019 data (written in Spanish).
- Expert Report, January 5, 2021. Subject: Regulatory Accrual Collected by Suiza Dairy as of December 31, 2019 (written in Spanish).
- Expert Report, December 20, 2019. Subject: Determination of the 2020 regulated margin for UHT milk processors using 2018 data (written in Spanish).
- Expert Report, September 6, 2019. Subject: Regulatory Accrual Collected by Suiza Dairy as of December 31, 2018 (written in Spanish).
- Expert Report, September 6, 2019. Subject: Cost Allocation Analysis in the Aguadilla Plant (written in Spanish).
- Expert Report, September 5, 2019. Subject: Determination of the 2020 regulated margin for fresh milk processors using 2018 data (written in Spanish).
- Expert Report, July 9, 2019. Subject: Determination of the 2019 regulated margin for milk processors using 2017 data (written in Spanish).
- Expert Report, March 29, 2018. Subject: Determination of the 2018 regulated margin for milk processors using 2016 data (written in Spanish).

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- Expert Report, March 29, 2018. Subject: Determination of the 2017 regulated margin for milk processors using 2015 data (written in Spanish).
- Expert Report, May 29, 2014. Subject: Opinion on the "Report of Findings of the Audits of the Puerto Rican Milk Industry Components for year 2012 Updated to 2013" from ORIL, Section "Milk Production."
- Expert Report, May 29, 2014. Subject: Determination of the 2014 regulated margin for milk processors (written in Spanish).
- Expert Report, April 4, 2012. Subject: Determination of the 2012 regulated margin for milk processors (written in Spanish).
- Expert Report, December 20, 2010. Subject: Determination of the 2011 regulated margin for milk processors (written in Spanish).
- Expert Report, November 6, 2009. Subject: Determination of the 2010 regulated margin for milk processors (written in Spanish).
- Direct Oral Testimony and Expert Report, July 15, 2009. Subject: Milk gathering routes for the School Program (Spanish).
- Direct Oral Testimony, May 15, 2008. Subject: ORIL Price Order and regulatory standards.
- Expert Report, May 14, 2008. Subject: Rebuttal report to the ORIL Price Order.

Suiza Dairy

- *Puerto Rico State Court, Civil Case: KDP1999-0798 (507)*

  Subject: Opinion about the amount of damages allegedly owed by Suiza Dairy to a class of fresh milk consumers as a result of processing raw milk that was adulterated with water and salt by a group of farmers and truck drivers.

  - Supplementary Report, April 9, 2019.
  - Deposition, November 20, 2015.
  - Expert Report, November 9, 2015.

Small Displacement Vehicles Manufacturer

- *Vento Motorcycles, Inc. v. United Mexican States*, ICSID Case No. ARB(AF)/17/3

  Subject: Economic Analysis of Small Displacement Vehicles Market in a North American Country.

  - Expert Report, February 8, 2019.

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Panama Water Treatment Plant Operator

- *Ad Hoc Arbitration*

  Subject: Opinion about the amount of compensation due to early termination of a concession contract and the price adjustment mechanism for potable water in Panama.

  - Supplementary Expert Report, March 8, 2018.
  - Expert Report, February 16, 2016.

Silo Manufacturer

- *United States District Court, Western District of Wisconsin, Case No: 16-cv-644*

  Subject: Damages and Compensation Estimation as a Result of Breach of Exclusivity Distribution Contract.

  - Direct Oral Testimony, February 15, 2018.
  - Deposition, February 5, 2018.
  - Expert Report, January 26, 2018.

Suiza Dairy Inc.

- *Puerto Rico Dairy Farmers Association. v. Secretary of Agriculture and the Administrator of the Office of the Milk Industry Regulatory Administration for the Commonwealth of Puerto Rico*, U.S. District Court for the District of Puerto Rico, Civil No. 08-2191 (DRD)

  Subject: Alleged wrong incentives given by the milk industry regulatory framework; identified a lack of opportunity for dairy farms to earn a just and reasonable return and proposed measures to create fair opportunities.

  - Direct Oral Testimony, March 22, 2017. Subject: Contempt Hearing about lack of compliance by the regulator with a Federal Court Sentence.
  - Affidavit, August 10, 2016. Subject: Exports of UHT and pre-pasteurized milk from Puerto Rico.

Solar Developer

- *Puerto Rico State Court, Civil Case: K AC2015-0465*

  Subject: Damages and Compensation Estimation as a Result of Breach of Contract.

  - Expert Report, January 9, 2017.

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Solar Developer

- *AAA Arbitration, Case No. 4290-006*

  Subject: Damages and Compensation Estimation as a Result of Breach of Contract.

  - Direct Oral Testimony, November 28 and December 2, 2016.
  - Deposition, October 12, 2016.
  - Expert Report, August 5, 2016.

Food and Beverage Distributor

- *ASBCA Arbitration*

  Subject: Sample Selection using Cluster Analysis.

  - Supplementary Expert Report, July 5, 2016.
  - Expert Report, April 22, 2016.

Argentine Natural Gas Buyer

- *ICC Case 19994/ASM (C-20433/ASM)*

  Subject: Opinion about the impact of exchange rate controls and other government measures in the contractual price of natural gas.

  - Direct Oral Testimony, July 21, 2016.
  - Expert Report, February 11, 2016.

Total Petroleum

- *In Re: Methyl Tertiary Butyl Ether ("MTBE" Products M21-88 Liability Litigation*, United States District Court, Southern District of New York, Master File No. 1:00-1898, MDL 1358 (SAS)

  Subject: Opinion about the knowledge of the composition of gasoline by downstream agents in the MTBE Class Action case.

  - Deposition, April 28, 2014.
  - Expert Report, April 7, 2014.

Latin American Water Regulator

- *ICC Case – Second Stage*

  Subject: Opinion about the economic equilibrium of a water and sewage concession.

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- Expert Report, August 5, 2015.

- *ICC Case No. 18746/CA/ASM– First Stage*

  Subject: Opinion about the level of collections for a water utility to be included in the calculation of its tariffs in a Latin American country in a dispute between the utility and the regulator.

  - Direct Oral Testimony, May 8, 2014.
  - Expert Report, February 2, 2014.

Chevron Puerto Rico LLC, Shell Company (Puerto Rico) Limited, Esso Standard Oil Company (Puerto Rico) and Sol Puerto Rico Limited

- *Jesús Trilla y Otros v. Estado Libre Asociado de Puerto Rico y Otros*, CIVIL No. KAC-00-1096 (907),

  Subject: Class Action Lawsuit demanding compensation for the temperature adjustment of gasoline and diesel, which are bought by wholesalers at prices expressed at 60º F and sold at ambient temperature, also known as "Hot Fuel."

  - Settlement Advance Expert Report, May 29, 2019.
  - Settlement Expert Report (Esso Standard Oil Company (Puerto Rico)), December, 2013.
  - Direct Oral Testimony, October 20 and 21, 2009.
  - Meeting of Experts and Presentation to Judge, September 2, 2009.
  - Expert Report (Sol Puerto Rico Limited), April 30, 2009.
  - Expert Report (Chevron Puerto Rico LLC, Shell Company (Puerto Rico) Limited and Esso Standard Oil Company (Puerto Rico)), March 31, 2009.

Suiza Dairy Inc.

- *Vaquería Tres Monjitas, Inc. and Suiza Dairy Inc. v. Secretary of Agriculture and the Administrator of the Office of the Milk Industry Regulatory Administration for the Commonwealth of Puerto Rico,* U.S. District Court for the District of Puerto Rico, Civil Case No.: 04-1840 (DRD)

  Subject: Wrong incentives given by the milk industry regulatory framework; identified a lack of opportunity for fresh milk processors to earn a just and reasonable return and proposed measures to create fair opportunities.

  - Affidavit, May 3, 2024. Subject: Detail of the Economic Actions and Inactions by the Regulator that Potentially Violate the Judge's Sentence.

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- Direct Oral testimony, December 1, 2012. Subject: Raw milk price reduction for processing fluid milk, contempt hearing.
- Expert Report: November 27, 2012. Subject: Calculation of Damages to Suiza Dairy from ORIL's Policies of Raw Milk Price Reduction for Processing Fluid Milk.
- Direct Oral Testimony, June 27 and December 1, 2012. Subject: Rate of return and prices in Puerto Rico for Compliance of Preliminary Injunction.
- Direct Oral Testimony, June 23-25 and 27, and September 6, 7, and 8, 2011. Subject: Regulatory Parameters needed in Puerto Rico.
- Affidavit, September 8, 2011. Subject: Information for the School Luncheon Program in Puerto Rico.
- Expert Report: June 24, 2010. Subject: Risk of conducting businesses in Puerto Rico.
- Direct Oral Testimony, September 16 and 17, 2009. Subject: Rate of return in Puerto Rico.
- Direct Oral Testimony, February 13 and 16, 2009. Subject: Regulatory accrual, equity buildup, and rate of return.
- Affidavit, April 25, 2008. Subject: Description of the financial and economic situation of Suiza Dairy in Puerto Rico.
- Affidavit, April 12, 2006. Subject: Description of the financial and economic situation of Suiza Dairy in Puerto Rico.
- Affidavit, August 21, 2004. Subject: Description of the financial and economic situation of milk processing plants in Puerto Rico.

Law Firm

- *ICDR Case NO. 50 198 T0066409*

  Subject: Opinion about the non-monetary benefits obtained by a Chilean natural gas marketing company from the settlement of a natural gas supply contract dispute for gas delivery from Argentina.

  - Direct Oral Testimony, May 30, 2012
  - Expert Report, November 10, 2011

Urbaser - CABB

- *Urbaser SA and Consorcio de Aguas Bilbao Biskaia, Bilbao Biskaia Ur Partzuergoa. v. Argentine Republic*, ICSID Case No. ARB/07/26

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Subject: Expropriation of a water utility concession in the province of Buenos Aires

- Post-Hearing Complementary Report, September 30, 2015. Subject: Complementary opinion on additional valuation presented by opposing experts.
- Post-Hearing Reply Report, July 31, 2015. Subject: Opinion on Valuation of alternatives requested by the Tribunal presented by the opposing experts.
- Post-Hearing Report, March 30, 2015. Subject: Valuation of alternatives requested by the Tribunal.
- Cross-Answering Testimony and Hot-tubbing, December 1 and 2, 2014.
- Expert Reply Report, November 6, 2013
- Expert Report, December 30, 2010

San Diego Fire Lawyers

- *In Re: 2007 Wildfire Individual Litigation – Witch Creek/Guejito Fires; Edward Malone; Hidden Valley Ranch, et. al. v. San Diego Gas & Electric Company; Sempra Energy; Coxcom, Inc., and DOES 1-50, Case Nos. CPU-PO-CTL 2008 00093080 and 37-2008-00081779-CU-PO-CTL*

  Subject: Operational cost information typically available in tariff reviews related to SDG&E.

  - Affidavit, October 4, 2011.

Impregilo

- *Impregilo S.p.A. v. Argentine Republic*, ICSID Case No. ARB/07/17

  Subject: Expropriation of a water utility concession in the province of Buenos Aires

  - Cross-Answering Testimony, March 15, 2010
  - Expert Reply Report, October 30, 2009
  - Expert Report, October 16, 2008

Fibers Manufacturer

- *AAA Case No. 16 181 Y 00365 08*

  Subject: Opinion about the changes in prices of crude oil that are politically and naturally driven

  - Direct Oral Testimony, October 15, 2008
  - Disclosure of Anticipated Rebuttal testimony, October 1, 2008

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- Disclosure of Anticipated Expert testimony, September 3, 2008

Occidental Chemical Corp.

- *Before the Federal Energy Regulatory Commission (FERC),* Entergy Services, Inc., Docket No. ER07-682-000

  Subject: Opinion on four amendments proposed by Entergy to functionalize costs

  - Cross-Answering Oral Testimony, January 23, 2008
  - Deposition, January 10, 2008
  - Expert Report, November 19, 2007

Government of Turkey

- *Izmit Su A.Ş. v. The Metropolitan Municipality of Kocaeli, The International Arbitral Center of the Austrian Federal Economic Chamber*

  Subject: Impact on the water selling price of a water treatment plant from differences in investments, financing and operational costs

  - Direct Oral Testimony and Hot-tubbing, March 21, June 12 and 13, 2007
  - Rebuttal Report, February 2, 2007
  - Expert Report, November 17, 2006

Superintendencia de Electricidad (Bolivian Electricity Regulator)

- Comité Nacional de Despacho de Carga (CNDC)
  - Direct Testimony and Cross-Examination, April 11, 2007. Subject: Changes to the calculation of electricity capacity payments for generators in Bolivia (in Spanish).
  - Expert Report, January 18, 2007. Subject: Changes to the calculation of electricity capacity payments for generators in Bolivia (written in Spanish).

Department of Public Service, State of Vermont

- Green Mountain Power Corp. (GMP)
  - Expert Report, August 4, 2006. Subject: Determination of the electricity distribution cost of service of GMP for the 2007 period.
  - Expert Report, August 4, 2006. Subject: Determination of the cost of service for the alternative regulatory plan.

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Vaquería Tres Monjitas, Inc. and Suiza Dairy Inc.

- *Vaquería Tres Monjitas, Inc. and Suiza Dairy Inc. v. Secretary of Agriculture and the Administrator of the Office of the Milk Industry Regulatory Administration for the Commonwealth of Puerto Rico*, U.S. District Court for the District of Puerto Rico

  Subject: Wrong incentives given by the milk industry regulatory framework; identified a lack of opportunity for fresh milk processors to earn a just and reasonable return and proposed measures to create fair opportunities.

  - Affidavit, September 6, 2007. Subject: Regulatory standards for the Puerto Rico milk market.
  - Direct Oral Testimony, August 12 and 22, 2005; September 16, 20, 23, 26, and 27, 2005; October 12 and 13, 2005.
  - Supplemental Report, August 19, 2005.

- Oficina de la Reglamentación de la Industria Lechera (Puerto Rican Milk Regulator)
  - Expert Report, September 6, 2007. Subject: Regulatory standards for the Puerto Rico milk market.
  - Direct Oral Testimony, July 31, 2007. Subject: Proposed regulatory principles for the Puerto Rico milk market.
  - Expert Report, September 7, 2006. Subject: Determination of the 2007 regulated margin for milk producers.
  - Expert Report, August 31, 2005. Subject: Determination of the 2006 regulated margin for milk producers.
  - Expert Report, August 27, 2004. Subject: Determination of the 2005 regulated margin for milk producers (written in Spanish).
  - Expert Report, September 11, 2003. Subject: Determination of the 2004 regulated margin for milk producers (written in Spanish).

Pemex Gas y Petroquímica Básica

- Tenth Federal Court of the Metropolitan Region in Tax and Administrative Matters
  - Expert Report, October 29, 2010. Subject: Definition of the trade balance for the natural gas industry in the national integrated system of pipelines in Mexico.

- Comisión Reguladora de Energía (CRE, the energy regulator in Mexico)
  - Direct Testimony, February 23, 2007. Subject: Roll-in of natural gas transportation tariffs in Mexico.

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- Expert Report, June 6, 2005. Subject: Methodology to determine natural gas prices in Mexico.
- Expert Report, March 2, 2004. Subject: Estimation of the X factor for natural gas transportation tariffs in Mexico.
- Expert Report, February 24th, 2004. Subject: Methodology to determine the initial natural gas transportation tariffs in Mexico.

Azurix Corp

- *Azurix Corp v. Government of Argentina*, ICSID Case No. ARB/01/12

  Subject: Expropriation of a water utility concession in the province of Buenos Aires

  - Testimony, October 11, 2004
  - Rebuttal report, April 15, 2004
  - Expert report, October 15, 2002

Citibank, N.A., Dresdner Bank AG, et. al.

- Citibank, N.A. and Dresdner Bank AG in their case against AIG Europe (UK) Ltd. and Sovereign Risk Insurance, London Courts of International Arbitration

  Subject: Claimants right to collect on a political risk insurance policy as a result of the expropriation of assets in the electric utility Edelap in Argentina

  - Expert Rebuttal report, September 17, 2004
  - Meeting of Experts, September 3, 2004
  - Expert Report, August 6, 2004

JPMorgan Chase Bank, WestLB AG, Banco Bilbao Vizcaya Argentaria SA, Deutsche Bank AG

- JPMorgan Chase Bank, WestLB AG, Banco Bilbao Vizcaya Argentaria SA, Deutsche Bank AG in their case against Lloyd's Syndicates: XLB; NJM; NKB; AFB; LSM; HAY; COX; AGM; and AGY and Liberty Mutual Insurance Europe Limited, London Courts of International Arbitration

  Subject: Claimants right to collect on a political risk insurance policy as a result of the expropriation of assets in the electric utility Edeersa in Argentina

  - Expert Exhibits Filed in Support of Statement of Case, May 25, 2004

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Electropaz

- Superintendencia de Electricidad (Bolivian Electricity Regulator)
    - Expert Report, January 2, 2004. Subject: Determination of electricity distribution tariffs (written in Spanish).
    - Expert Report, July 12, 2002. Subject: Scope of an extraordinary review of electricity tariffs (written in Spanish).

Superintendencia de Electricidad (Bolivian Electricity Regulator)

- Compañía Boliviana de Energía Eléctrica (COBEE), 2006 Tariff Review
    - Direct Testimony and Hot-tubbing, October 18, 2006. Subject: Regulatory treatment of premium and deductibles of COBEE's hydroelectric assets.
    - Expert Report, October 9, 2006. Subject: Regulatory treatment of premium and deductibles of COBEE's hydroelectric assets (written in Spanish).
- Compañía Boliviana de Energía Eléctrica (COBEE), 2002 Tariff Review
    - Expert Report, January 26, 2002. Subject: Set of tariff procedures to be adopted and its implementation in the tariff review of COBEE (written in Spanish).
- Compañía Boliviana de Energía Eléctrica (COBEE), 1999 Tariff Review
    - Expert Report, September 6, 1999. Subject: Opinion on COBEE's appeal in the electricity tariff review process in Bolivia (written in Spanish).

Incitec Limited and BHP

- IPART (Independent Price and Regulatory Tribunal), New South Wales, Australia
    - Reply Comments to AGLGN regarding March 22 and April 15 Submissions.
    - Supplementary Submission (Incitec Limited), April 27, 1999. Subject: Discussion of reload practices, customer contributions, operating expenses, and recalculation of charges for a user of the distribution network in AGLGN's proposed access arrangements.
    - Supplementary Submission (BHP), April 15, 1999. Subject: Calculation of AGLGN's costs and tariffs in New South Wales.
    - Submission (BHP), March 22, 1999. Subject: Presentation of initial comments to AGLGN's revised access arrangement information to IPART.

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Capex, Central Puerto, Duke Energy International, Hidroeléctrica Cerros Colorados, Hidroeléctrica El Chocón, and Hidroeléctrica Piedra

- Ente Nacional Regulador de la Electricidad (electricity regulator), Argentina
    - Public Hearings Oral Testimony, May 29, 1998, and June 2, 1998. Subject: Description of the economic principles of electricity transmission tariffs and the efficiency factor (Spanish).
    - Expert Report, May 25, 1998. Subject: Analysis of costs and investments to be considered for the revenue requirement of the electricity transmission company (report written in Spanish titled "Análisis de Costos e Inversiones. Revisión Tarifaria de Transener").

EEGSA

- *EEGSA vs. CNEE* (Guatemalan Electricity Regulator), Expert Tribunal
    - Member of Expert Tribunal, May 30 to July 30, 2008.
- *CNEE* (Guatemalan Electricity Regulator)
    - Expert Report, May 5, 2008. Subject: "EEGSA 2008-2013 Tariff Proposal." Dr. Giacchino authored 8 out of 10 expert reports filed with the regulator (written in Spanish).
    - Expert Report, July 30, 2003. Subject: Determination of electricity distribution tariffs (written in Spanish).

COELBA

- ANEEL (Brazilian Electricity Regulator)
    - Expert Report, January 27, 2003. Subject: Determination of electricity distribution O&M costs.

Electrocentro, Electronoroeste, Electronorte, and Electronorte Medio

- OSINERG (Peruvian electricity regulator)
    - Public Hearing Oral Testimony, September 25, 2001. Subject: Description of the due regulatory process and responsibilities of the different participants in the determination of electricity distribution tariffs (written in Spanish).
    - Expert Report, March 12, 2001. Subject: Opinion on behalf of Electrocentro on the criteria used in the assets valuation method currently used by the electricity regulator in Perú for tariff purposes (written in Spanish).

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- Expert Report, March 12, 2001. Subject: Opinion on behalf of Electronoroeste on the criteria used in the assets valuation method currently used by the electricity regulator in Perú for tariff purposes (written in Spanish).
- Expert Report, March 12, 2001. Subject: Opinion on behalf of Electronorte on the criteria used in the assets valuation method currently used by the electricity regulator in Perú for tariff purposes (written in Spanish).
- Expert Report, March 12, 2001. Subject: Opinion on behalf of Electronorte Medio on the criteria used in the assets valuation method currently used by the electricity regulator in Perú for tariff purposes (written in Spanish).

Other Testimony

- *FERC Proceeding, Nevada Power Company, Docket No. EL15-22-000*
  - Staff Meeting. January 29, 2015. Subject: Market-based rate application of Nevada Power Company and response to FERC show-cause order.
- *TECO Guatemala Holdings, LLC vs. Republic of Guatemala*, ICSID No. ARB/10/23
  - Oral Testimony. March 4, 2013. Subject: Testimony describing participation as Project Director of a team elaborating a tariff proposal and later as a member in a Commission of Experts deciding on a series of disputes between the Government of Guatemala and an electric distribution company.
  - Second Witness Declaration. May 24, 2012. Subject: Additional declaration describing participation as Project Director of a team elaborating a tariff proposal and later as a member in a Commission of Experts deciding on a series of disputes between the Government of Guatemala and an electric distribution company.
  - First Witness Declaration. September 23, 2011. Subject: Declaration describing participation as Project Director of a team elaborating a tariff proposal and later as a member in a Commission of Experts deciding on a series of disputes between the Government of Guatemala and an electric distribution company.
- *Iberdrola Energía SA vs. Republic of Guatemala*, ICSID No. ARB/09/5
  - Oral Testimony. July 26, 2011. Subject: Testimony describing participation as Project Director of a team elaborating a tariff proposal and later as a member in a Commission of Experts deciding on a series of disputes between the Government of Guatemala and an electric distribution company.
  - Second Witness Declaration. September 22, 2010. Subject: Declaration describing participation as Project Director of a team elaborating a tariff proposal and later as

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a member in a Commission of Experts deciding on a series of disputes between the Government of Guatemala and an electric distribution company.

- First Witness Declaration. October 19, 2009. Subject: Declaration describing participation as Project Director of a team elaborating a tariff proposal and later as a member in a Commission of Experts deciding on a series of disputes between the Government of Guatemala and an electric distribution company.

Honda

- Japanese Tax Court

  Subject: Impact of the 1999 Devaluation of the Real in Brazil

  - Expert Report, April 2, 2004

Selected Experience

Selected International Arbitration Experience

- Provided an assessment of damages and compensation for a potential arbitration against an European country related to two transportation concessions.
- Provided an assessment of damages and compensation for a potential arbitration against a Latin American country related to a transportation concession.
- Provided statistical analyses in a dispute regarding a contract for the provision of food and logistics support to a major government's military forces deployed overseas.
- Provided support to a law firm on developing a Memorial on the Merits on the expropriation of a chemical company in Serbia
- Submitted testimony and directed financial modeling of electricity distribution companies in Argentina for multiple international arbitration cases at the LCIA involving disputes for political risk insurance policies between investment banks and insurance companies
- Advised in the valuation of damages of a hydroelectric operator in Turkey in an international arbitration case
- Advised in the international arbitration between two telecommunications companies in Brazil with respect to the appropriate discount rate
- Advised in the arbitration between an investment bank and an insurance company as a result of the default of a highway concessionaire in Argentina in an ad hoc arbitration proceeding

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- Assessed an international arbitration case for an electric utility in Bolivia
- Advised in arbitration concerning gas treatment facilities pricing at Kapuni, New Zealand, for Shell Company Limited and Todd Petroleum Mining Company Limited
- Provided the Chilean Government with an opinion during the dispute between the Ministry of Finance and the Ministry of Public Works about the licensing of highways in Central Chile

Selected Regulatory and Restructuring Experience

- Proposed changes to the multi-year price determination methodology in the electricity sector in South Africa.
- Support to an electric utility in the filing of a tariff proposal in a Caribbean Island.
- Developed proposal for FERC Notice of Inquiry for Modifications to Commission Requirements for Review of Market-Based Rate Applications under Section 205 of the Federal Power Act on behalf of two large industrial electricity consumers in the Western US (Docket No. RM16-21-000)
- Researched electric submarine cable crossings in most of the Coastal states in the US.
- Advised in the demand forecasting for a New Mexico utility in its tariff review process.
- Proposed an analysis framework for the Government of Mexico to decide when to incorporate new natural gas pipelines into the national integrated network
- Determined new parameters for the calculation of the capacity payments for generators in Bolivia
- Developed a new pricing mechanism and regulatory accounting for the oil industry in South Africa
- Devised the regulatory strategy for the tariff review of an electric distribution company in Panama
- Provided assistance to the operator of the Rome (Italy) airport in explaining tariff regulation to the regulator
- Advised an electric distribution company in Portugal in its tariff review
- Modeled alternative regulatory schemes for the milk industry in Puerto Rico on behalf of the fresh milk processing plants
- Directed benchmarking of Tres Monjitas (Puerto Rican milk processor) management fees and milk processing costs and calculated milk prices

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- Calculated milk prices and directed the regulation of milk prices for Suiza Dairy and Tres Monjitas in Puerto Rico
- Advised in a research project concerning the regulatory treatment of the separation of natural gas and liquids for transportation companies for Surgutgazprom in Russia
- Advised in the creation of a transportation regulator (CRTR) in Colombia
- Advised on regulatory strategy by reviewing the commercial and regulatory framework proposed by the Dutch energy regulator and by drawing up a suggested market model strategy for the Netherlands gas transportation company, Gasunie
- Advised on the implementation of a framework for gas market competition and regulation with emphasis on Gas Law, licenses, regulations, a Gas Network Code, codes of practice, gas pipeline tariffs, asset transfers, retail competition and related computer systems for the Government of Singapore
- Designed regulatory accounting for natural gas distribution and natural gas and liquids transport in Perú for Comisión de Tarifas de Energía
- Advised in the definition of "unit of property" for a railway company regulatory hearing in the United States
- Advised in the Total Factor Productivity estimation at a regulatory hearing for the U.S. electric distribution industry for an electric company in Alberta, Canada
- Designed a natural gas transportation tariff model and advised on a new regulatory framework for pipelines in Spain
- Directed in the development and implementation of a regulatory system of accounts for the electricity sector in Mexico
- Advised the government of Perú on the Camisea gas price and the changes in the electricity sector's legal and regulatory framework in Perú
- Advised in the international public tender of the natural gas transportation company from Camisea to Lima and in the international public tender of the natural gas distribution company in Lima
- Reviewed regulatory costs and investments of the Argentinean electricity transmission company (Transener) for a Consortium of generators in Argentina for the public hearing on Transener's revenue requirement determination
- Directed the regulatory analysis and development of a fiscal, legal, and commercial framework proposal regarding the proposed Central American Pipeline. Proposal included

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analysis on gas import, transportation, distribution, and marketing in El Salvador, Honduras, and Guatemala

- Advised in a survey of Power Pool regulation in electricity industries around the world for Electricity Pool of England and Wales
- Determined rate structure, provided regulatory advice, and delivered a market study of the natural gas distribution company in Monterrey, Mexico, for Pérez Companc
- Advised on issues regarding regulatory framework and potential changes in the privatization of the natural gas distribution company (Comgas) in Sao Paulo, Brazil, for BG PLC
- Provided regulatory assistance in the tariff review process and determined the optimal design standard for MetroGas, a natural gas distribution company in Argentina
- Developed a methodology for tariffs, prices, and the cost of service and support for Pemex Gas y Petroquímica Básica in negotiations and discussions with the Regulatory Energy Commission
- Advised about restructuring and competitive market trends in wholesale and retail electricity markets to develop strategies for a new retail subsidiary of Eskom in South Africa
- Advised the Mexican Secretariat of Energy on restructuring of the Mexican electricity sector, tariff structure, and fuels policy
- Directed the tariff review of an Argentinean electricity transmission company for a Consortium of generators in Argentina and provided direct testimony at the public hearing regarding the setting of variable revenue, efficiency factor, rewards system, and line reclassification
- Managed the long-term planning of Pemex for its corporate strategies with respect to new regulations that affect oil products and gas markets

Other Selected Litigation Experience

- Developed an algorithm based on statistical analyses to determine the amount of interest overpaid by an agency related to education loans
- Advised an oil company in its antitrust litigation against accusations of bundling gas and car washes

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- Advised the Upper Occoquan Sewage Authority (UOSA), a water and wastewater company in Virginia, in a BOT dispute with a construction company over the adjustment of payments for the construction of a wastewater plant
- Advised in litigation between the Government of Puerto Rico and Puerto Rican milk processors due to the failure of the government to provide processors with an opportunity to earn a reasonable return
- Advised a testifying expert on a monopolization case in the frozen pizza market
- Advised in a worldwide cartelization case for price fixing of transformers for substations
- Advised in the bankruptcy of a U.S. energy company in the valuation of natural gas capacity contracts
- Advised in the valuation of a natural gas storage facility in the Northwest region of the United States
- Determined the market value of a private natural gas transmission company in Kansas
- Advised on market power studies for electric companies in the U.S.

Selected Business Consulting Experience

- Advised in the socioeconomic study of a hydroelectric company in the state of Maryland.
- Advised in the socioeconomic study of a hydroelectric company in the state of Pennsylvania.
- Advised on the privatization of oil refineries in Nigeria.
- Advised the Government of Ontario, Canada, on the tender to purchase 24,000 megawatts in electricity generation
- Analyzed investment opportunities in the Mexican energy sector for a private utility
- Analyzed the pipeline from Mexico to Guatemala for the Mexican Secretariat of Energy and authored report, “Gasoducto México-Guatemala: Informe Final,” (written in Spanish) that was given by President Zedillo (México) to President Arzú (Guatemala)
- Determined the productivity factor for an electric utility in New England
- Advised an investment bank in the sale-lease of rolling stock assets for railway company in Hong Kong, KCRC
- Designed strategies for natural gas storage facilities for a major utility in New England

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- Advised in the calculation of the productivity of electricity transmission and distribution companies in North America for a Canadian company
- Advised the government of Hong Kong in the privatization of MTRC, a Hong Kong railway and subway company
- Advised an international company on the natural gas market in Mexico and Texas for the tender of IPPs in Mexico
- Advised Capitaltec Consultoria Economica S.A. in the privatization of the local natural gas distribution company of Rio de Janeiro, Brazil
- Analyzed competitiveness and access undertaking in the natural gas distribution industry in the State of Victoria, Australia
- Provided long-term trading strategies to a natural gas trading company in Texas
- Analyzed the then current status of the Russian Oil Transport System and proposed revisions to the current operational arrangements
- Evaluated the Camisea gas field and pipeline development project for Perupetro, S.A., Government of Perú
- Analyzed business opportunities for a Guatemalan electricity marketer in the Central American region
- Analyzed toll adjustment formulas and macroeconomic forecasts for the bid to buy a highway in Indiana
- Advised in several socioeconomic studies in the electricity, natural gas and transport industries.
- Advised in the acquisition of a hydrocarbons producing company by an integrated oil and natural gas company in the United States
- Directed a due diligence project to acquire an electric utility in Panama
- Developed a business plan for the creation of the National Energy Regulator in South Africa
- Advised in the merger of MTRC and KCRC (rail companies) in Hong Kong
- Directed the design of a marketing strategy in the United States for a Mexican hydrocarbons company
- Advised in the negotiation of a natural gas contract for a producer in Australia

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- Designed the gasification program for the privatization of the natural gas distribution companies for Petróleos de Venezuela

Selected Valuation and Rate Design Experience

- Advised in the settlement of a contractual dispute related to the delivery and payment of Certified Emission Reductions (CERs) in the European markets, valuing cash flow streams.
- Developed a proposal for a new methodology to determine natural gas locational prices in Mexico
- Provided worldwide natural gas markets forecasts to a conglomerate of natural gas distributors in Mexico
- Advised in the bankruptcy of a U.S. energy company in the valuation of natural gas capacity contracts
- Analyzed natural gas international interconnections for the Scandinavia Gas Network
- Advised in the valuation of an electric utility in Argentina for a distressed debt fund
- Advised in the determination of transfer prices for an automobile company in Brazil
- Determined natural gas prices hedging alternatives for an international company in México
- Determined cargo-handling charges for the International Airport of Lima, Perú, for Lima Airport Partners
- Determined the efficiency factor (X) in the natural gas transmission and distribution industry in Argentina
- Coordinated capacity payments and emissions trading training for a group of executives from a European electric company
- Determined X factor and base tariff methodologies for a natural gas transportation company in Mexico in preparation for the negotiation with the regulator
- Directed the tariff review of Electropaz, an electricity distributor, in Bolivia
- Forecasted natural gas prices in five U.S. basins for a tender of a natural gas pipeline
- Advised in the tariff review of an electricity distribution company in Brazil
- Directed the tariff review of Empresa Eléctrica de Guatemala
- Analyzed the effect of generation clustering in the context of opening the electric generation market to competition in South Africa

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- Developed the Network Code for a natural gas transportation company in Italy
- Directed a worldwide survey of natural gas transportation companies' reporting requirements for a company in Italy
- Analyzed the scope of an extraordinary tariff review of a Bolivian electricity distribution company
- Determined the natural gas demand and prices in Guatemala, Honduras, and El Salvador for an international consortium of companies
- Advised one gas marketer and one gas user on the calculation of natural gas distribution tariffs of the AGLGN system in New South Wales, Australia
- Evaluated the market effects of the EON and Ruhrgas merger on behalf of EnBw in Germany
- Advised an electricity distribution company in Brazil in the determination of the cost of capital and on the analysis of the Revitalization Measures implemented by the government
- Benchmarked electric distribution asset valuation methods and values for a multinational company in Latin America
- Advised on the design of natural gas pipeline capacity contracts for new interstate pipelines with emphasis on new capacity construction and financing, services offered, tariff structure, systems operations, and contractual terms and conditions for the ACCC in Australia
- Directed the financial evaluation of the Dominican Republic Electricity Sector as a due diligence process for the World Bank
- Directed the tariff review of a generation company in Bolivia for Superintendencia de Electricidad
- Developed a value chain for hydrocarbons in Mexico for an international investor
- Determined a price cap for oil pipeline transport services in Perú for Osinerg
- Advised on rate of return for a natural gas distribution company in Argentina
- Analyzed the effects of incremental and roll-in tariff policies in the Mexican gas pipelines for a private utility
- Directed a study of natural gas reference prices for the electricity industry in Bolivia for Comité Nacional de Despacho de Carga

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- Advised Electronoroeste S.A., Electronorte Medio S.A., Electrocentro S.A., and Electronorte S.A. in their tariff review of electricity distribution services in Perú
- Determined tariff conditions for natural gas transport and distribution in Perú for Comisión de Tarifas de Energía
- Designed alternatives for natural gas pricing for the petrochemical industry in Mexico
- Designed fuel energy policies in the development of a competitive electricity generation market in Mexico
- Designed electricity tariffs as part of Mexico's restructuring sector
- Determined natural gas transportation costs to be used in the calculation of electricity generation prices in Perú for the Comisión de Tarifas Eléctricas (CTE)
- Determined rates for LPG terminals of Pemex (oil and gas monopoly) in Mexico
- Directed the Hydrocarbons Team for the study of economic signals in the wholesale electricity market in Argentina
- Determined the rate of return of an electric utility company in Pennsylvania
- Determined the market value of a private natural gas transmission company in Kansas
- Directed investigation to determine a path for liquid fuels, crude oil, and natural gas pipeline tariffs in South Africa

Speaking Engagements

- Speaker: "Right Economic Signals Require Adequate Data and Tools," 2023 Webinar "Cost of Supply, September 11-12," Session 9: Tariff Structures, Components and Signals," NERSA, September 12, 2023.
- Speaker: "Power Market Regulation: Price Discovery in a Liberalised Market," 2022 Webinar "Regulated, Unbundled and Cost-Reflective Tariffs & Consumer Price Discovery in a Regulated Electricity Industry, November 23-24," NERSA, November 24, 2022.
- Speaker: "Power Market Regulation: Unbundled Cost Reflective Tariffs," 2022 Webinar "Regulated, Unbundled and Cost-Reflective Tariffs & Consumer Price Discovery in a Regulated Electricity Industry, November 23-24," NERSA, November 23, 2022.
- Speaker: "Role of the 1982 World Bank Guidelines on the Treatment of Foreign Direct Investment in the Valuation of Going Concerns and Non-Going Concerns," 2021 Washington Arbitration Week 2nd Edition, Washington, DC, December 1, 2021.

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- Speaker: "Lawyers and Consultants: Pro Tips for Getting Along and Getting Results," 2016 Mid-Year Energy Forum hosted by the Energy Bar Association, Washington, DC, October 6, 2016.
- Speaker: "Game Theory: How do the Incentives, Processes, and Psychology of ISDS Affect Damages Outcomes?," Fifth Annual Damages in International Arbitration Conference hosted by Juris, Washington, DC, September 16, 2016.
- Speaker: "Preventing or Minimizing Future Problems with Infrastructure Investments" Unlocking the Infrastructure Promise: What Does It Take?," hosted by John Hopkins University SAIS EEC, Washington, DC, March 13, 2016.
- Speaker: "Latest Trends in Utilities and Impact on their Capital Attraction" Modern Solutions Power Systems Conference hosted by Schweitzer Engineering Laboratories (SEL), Chicago, IL, June 3, 2015.
- Speaker: "Perspectives on Damages Claims: Claimant's Expert's Perspective in Investment Arbitration (Focus on Utilities)," Second Annual Damages in International Arbitration Conference hosted by Juris, Washington, DC, November 18, 2013.
- Speaker: "Toward Deregulation: Are the Electric Markets Competitive?" Modern Solutions Power Systems Conference hosted by Schweitzer Engineering Laboratories (SEL), Chicago, IL, June 7, 2013.
- Arbitrator: First LL.M. International Commercial Arbitration Moot Competition. American University, Washington, DC, March 9, 2012.
- Panelist: "Arbitration as a Growth Industry," The 15th Geneva Global Arbitration Forum: Ahead of the Curve, Geneva, Switzerland, December 9, 2010.
- Co-Author: "@RISK in the Analysis of Investment Treaty Arbitration." Palisade Risk Conference: Risk Analysis, Application and Training, Las Vegas, Nevada, November 5, 2010 (with Erica VanSant, Carolyn Witthoft, Eleanor Blalock and Rory Walck).
- Panelist: "Dealing with Damages," American Bar Association Section of International Law, Miami, FL, October 30, 2009.
- Speaker: "Calculating Regulated Rates – Putting the Pieces Together." FERC Administrative Litigation 101, Energy Bar Association Primer, April 22, 2009.
- Chair of Panel: "Use of Regulatory Accounts and Open Access Regulatory System for Transmission Lines." South Africa Department of Minerals and Energy, Energy Summit 2007, Johannesburg, South Africa, September 25–27, 2007.

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- Speaker (three papers): "Cost Reflective Tariff Setting Approaches," "Appropriate Regulatory Framework to Facilitate Entry of Piped Gas into the Market," and "Improving Governance of the Energy Sector." South Africa Department of Minerals and Energy, Energy Summit 2007, Johannesburg, South Africa, September 25–27, 2007.
- Speaker: "Prospects for Venezuela's Natural Gas Market." Venezuela Oil & Gas 1999: Strategic Partnerships for the New Millennium, Petroleum Industry Summit, September 22, 1999, Caracas (Venezuela).
- Panelist: "Doing Business in Competitive Markets." 4th Annual Latin America Power '99 Conference and Exhibition, June 30, 1999, Miami, FL.
- Speaker: "Energy Markets in Latin America." 1999 Oracle Energy Conference, Miami, June 11, 1999.
- Panelist: "Institutional Credibility of Regulatory Agencies." Utilities in Post-Privatization: New Relations among Government, Companies and Customers, December 2, 1998.
- Speaker: "Foster Improved Interaction Between Pemex & the New Gas Distributors." Natural Gas Projects in Mexico Conference, November 1997.
- Panelist: "Reorganization of Pemex & the Creation of the CRE: How Have These Changes Been Beneficial to Foreign Investors & Mexico?" Natural Gas Projects in Mexico Conference, November 1997.
- Speaker: "The Hysteresis of Dollarization in a Model of Currency Substitution with Transaction Costs." Seminar Series of Centro de Estudios Macroeconómicos, Buenos Aires, Argentina, August 7, 1994.
- Speaker: "A Methodology for Quantitative Ex-Post Evaluations." XXIV Annual Meetings of the Argentina Association of Political Economy, Rosario, Argentina, July 23, 1989. (with J. M. D. Pastore)
- Speaker: "El Mercado de Reservas de Petróleo." First Annual Conference of Oil Exploration, Mar del Plata, Argentina, April, 1989. (with S. Fidalgo)

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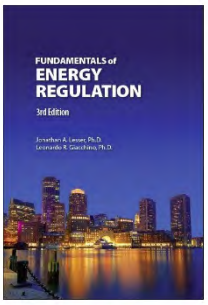
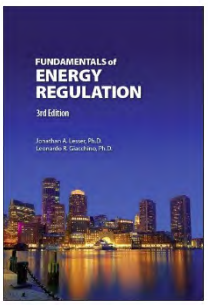
Publications

Books

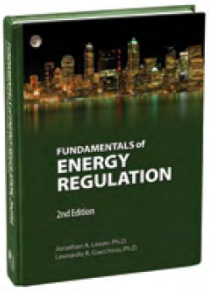
- *Fundamentals of Energy Regulation*. Bethesda, MD: Regulatory Economics Publishing, Inc., Third Edition Paperback, 2024 (with Jonathan A. Lesser).



- *Fundamentals of Energy Regulation*. Vienna, VA: Public Utilities Reports, Inc., Third Edition, 2019 (with Jonathan A. Lesser).



- *Fundamentals of Energy Regulation*. Vienna, VA: Public Utilities Reports, Inc., Second Edition, 2013 (with Jonathan A. Lesser).



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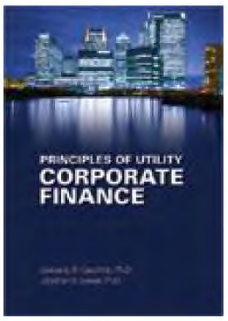
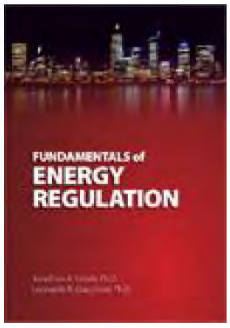
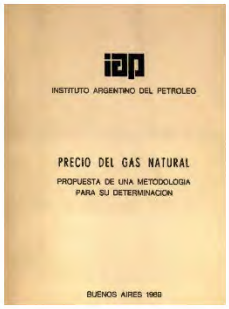
- *Principles of Utility Corporate Finance*. Vienna, VA: Public Utilities Reports, Inc., 2011 (with Jonathan A. Lesser).



- *Fundamentals of Energy Regulation*. Vienna, VA: Public Utilities Reports, Inc., 2007 (with Jonathan A. Lesser).



- Giacchino et al, *Precio del Gas Natural: Propuesta de una Metodología para su Determinación* (Buenos Aires, Argentina: Instituto Argentino del Petróleo, 1989).



Articles

- "What Premium to Use? The Setting of Post-Judgment Interest Rates Using Commercial Rates in Investment Arbitration." Journal of Damages in International Arbitration Vol. 5, No. 1 (2018) (with Thomas Sturma and Isabella Cotrupi).
- "Trends in Awards from Concluded ICSID Cases." Journal of Damages in International Arbitration Vol. 4, No. 2 (2017) (with Thomas Sturma).
- "Trends in Post-Judgment Interest Awarded in Investment Arbitration." Journal of Damages in International Arbitration Vol. 4, No. 1 (2017) (with Thomas Sturma).
- "Size and Trend of Concluded ICSID Cases." Journal of Damages in International Arbitration Vol. 2, No. 2 (2015) (with Joseph Coscia and Thomas Sturma).

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- "Historical Analysis of ICSID Concluded Cases." World Arbitration & Mediation Review Vol. 5, No. 1 (2011), (with Linda Ahee and Richard Walck).
- "Forecasting the Number of Future ICSID Cases." The Journal of World Investment & Trade Vol. 12, No. 2, (April 2011), (with Eleanor Blalock).
- "Damages Models to Accommodate the Necessity Defense." The International Litigation Quarterly Vol. 27, No. 1 (Fall 2010), (with Richard Walck).
- "International Arbitration Cases: Argentine Political Risk Insurance Litigation." Transnational Dispute Management 5, No. 2 (November 2005), (with Jeff D. Makholm).
- "Improving Market Power Mitigation Rules for Peaking Units." The Electricity Journal (October 2003), (with Joseph Crespo).
- "Latin Convergence." In Fundamentals of the Global Power Industry Yearbook 2000, Petroleum Economist.
- "Key Regulatory Concerns in the Energy, Telecommunications and Water Sectors in Latin America." Privatization International: Utility Regulation 2000 Series. Volume 2. Latin America, with César Herrera, Siôn Jones, Philip Maggs, Agustín Ros, and Kristina Sepetys.
- "Economic Regulatory Analysis of the New Venezuelan Natural Gas Law." Oil & Gas Journal Latin America (May–June 2000).
- "¿Tarificación de Servicios de Transporte: Incremental o Rolled-In?" Memorias Técnicas, Tomo 2, 567–70, 3d Conference and International Exhibition of Pipelines, Monterrey (Mexico), December 8, 1998 (Spanish).
- "¿Incremental o Rolled-In?: Experiencia en Otros Países." Petrotecnia (June 1998), (with Jeff Makholm) (Spanish).
- "The Persistence of Dollarization Processes." (Ph.D. diss., Duke University, 1996).
- "Rising Unemployment in Argentina: 1974–1993." CEMA working paper, August 1994, (with C. Pessino).
- "Intra-Industry Trade: Measurement and the Aggregation Problem." Mimeograph, Duke University, December 1993.
- "El Mercado de Reservas de Petróleo," Proceedings of the 1st National Conference of Hydrocarbons Exploration, Volume 1, Mar del Plata, April 1989, pp. 495-569 (Spanish).
- "Producción de Petróleo y Análisis de Costos en Argentina." Mimeograph, Astra CAPSA, Buenos Aires, Argentina, February 1988 (Spanish).

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Education

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- MA, Economics, Duke University
- BA, Economics, Universidad Católica Argentina

Honors and Distinctions

- Departmental Fellowship, Duke University, 1991–1995
- Graduate School Dissertation Travel Award, 1994
- Tinker Field Research Grant, 1993
- Summer Fellowship, Duke University, 1992
- El Cronista Comercial Undergraduate Award, Universidad Católica Argentina, 1988

Languages

- Spanish (native)
- English
- French (working knowledge)
- Italian (working knowledge)
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Evergy C&I Rates Calculation Summary

Rate Class

Input	
LGS Primary	= Input = Final Rate

Revenue Requirement Breakdown by Function

Function	%	
Generation Demand	61%	$72,284,256
Generation Energy	18%	$21,807,581
Distribution Demand	20%	$24,039,655
Customer	0%	$44,532
Total	100.00%	$118,176,023

Customer Charge Revenue Collection

Variable	
Number of Customer Months During Test Year	1,465
Monthly Customer Charge	$357
Total Fixed Charge Collection	$522,543
Customer Revenue Requirement from Cost of Service Study	$44,532
Revenue Needed From Volumetric Charge	-$478,011

Generation Demand Cost Assignment to Season & Period

Season	Period	%	
Summer	On-Peak	11.3%	$8,156,807
Summer	Off	40.3%	$29,108,919
Summer	Super Off	3.9%	$2,785,266
Winter	Off	16.0%	$11,591,473
Winter	Super Off	1.3%	$923,692
All	Demand	27.3%	$19,718,098

Generation Energy Cost Assignment to Season & Period

Season	Period	%	
Summer	On-Peak	11%	$2,367,978
Summer	Off	31%	$6,728,300
Summer	Super Off	4%	$953,138
Winter	Off	48%	$10,517,230
Winter	Super Off	6%	$1,240,936

Distribution Demand Cost Assignment to Season & Period

Season	Period		
All	All	100%	$24,039,655

Customer Cost Assignment to Season & Period

Season	Period	%	
Summer	On-Peak	5%	-$21,752
Summer	Off	23%	-$111,106
Summer	Super Off	8%	-$40,613
Winter	Off	49%	-$232,799
Winter	Super Off	15.01%	-$71,741

Energy Billing Determinant by Season & Period

Season	Period	Units	
Summer	On-Peak	kWh	113,147,755
Summer	Off	kWh	577,948,758
Summer	Super Off	kWh	211,261,094
Winter	Off	kWh	1,210,966,291
Winter	Super Off	kWh	373,182,740

Demand Billing Determinant by Season & Period

Charge Type	Units	
Demand Charge	kW	1,671,919
Facilities Charge	kW	8,275,793

Generation-Demand Rate by Season & Period

Season	Period	Units	
Summer	On-Peak	$/kWh	$0.07209
Summer	Off	$/kWh	$0.05037
Summer	Super Off	$/kWh	$0.01318
Winter	Off	$/kWh	$0.00957
Winter	Super Off	$/kWh	$0.00248

Generation-Energy Rate by Season & Period

Season	Period	Units	
Summer	On-Peak	$/kWh	$0.02093
Summer	Off	$/kWh	$0.01164
Summer	Super Off	$/kWh	$0.00451
Winter	Off	$/kWh	$0.00868
Winter	Super Off	$/kWh	$0.00333

Customer Charge Overcollection by Season & Period

Season	Period	Units	
Summer	On-Peak	$/kWh	-$0.00019
Summer	Off	$/kWh	-$0.00019
Summer	Super Off	$/kWh	-$0.00019
Winter	Off	$/kWh	-$0.00019
Winter	Super Off	$/kWh	-$0.00019

Final Energy Charges

Season	Period	Units	
Summer	On-Peak	$/kWh	$0.09283
Summer	Off	$/kWh	$0.06182
Summer	Super Off	$/kWh	$0.01750
Winter	Off	$/kWh	$0.01806
Winter	Super Off	$/kWh	$0.00561

Final Demand and Facilities Charges

Charge Type	Period	Units	
Demand	All	$/kW-month	$11.794
Facilities	All	$/kW-month	$2.905

Revenue Check

Charge Type	Units	
Energy Charge	$	$73,895,728
Demand Charge	$	$19,718,098
Facilities Charge	$	$24,039,655
Total Recovery	$	$117,653,480
Volumetric Revenue Recovery (Total Class RR - Fixed Charge Collection)	$	$117,653,480
% Difference from Total Recovery	$	0.00%

ARTICLES & BLOGS

Unlocking Data Center Sustainability with Energy-Efficient Delta Cube³ Cooling Technology

WRITTEN BY

May Lee

Unlocking Data Center Sustainable Cooling Technology with Delta Cube³ Cooling Technology

Data center efficiency is a constant concern for IT leaders, especially as businesses demand more computing power and high-performance capabilities. Balancing energy efficiency, cooling performance, and scalability is a significant challenge for colocation providers and businesses. This is where Delta Cube³ cooling technology comes in, offering an innovative solution for data center sustainable cooling in high-density environments, such as those found in cutting-edge colocation facilities.

What is Delta Cube³ Cooling Technology?

Delta Cube is an air-based cooling system that stands out for its energy efficiency, ability to handle variable IT workloads, and environmental friendliness. It's designed to support data center sustainable cooling with high-density power configurations, enabling

One of Delta Cube³'s main advantages is its ability to support up to 50kW per rack, making it ideal for environments requiring high-performance computing (HPC) or dense server configurations. This capability ensures that the infrastructure can accommodate advanced applications like AI model training or real-time data analytics while maintaining optimal energy consumption.

Why Is High-Density Cooling in Data Centers Necessary for Sustainability?

Cooling accounts for a significant portion of energy usage in any data center. As IT infrastructure evolves to support high-density computing workloads, the demand for efficient cooling solutions becomes even more critical.

Legacy cooling systems often struggle to keep up with these modern requirements, leading to:

- Increased energy costs
- Risk of IT equipment overheating
- Reduced IT equipment lifespan
- Inefficient use of data center space

Delta Cube³ helps mitigate these challenges by providing a cost-effective and scalable solution for high-performance environments.

Key Features of Delta Cube³ Data Center Sustainable Cooling

Let's explore some of the core features that make Delta Cube³ technology stand out for data center sustainable cooling:

1. **Advanced Air Cooling Mechanism**

Delta Cube's primary feature is its ability to use air-based cooling with a closed-water loop system that never needs additional water to cool the data hall. This provides significant resource savings, and waterless cooling is an especially critical feature for data centers in areas prone to water shortages or environmental regulations restricting water usage.

2. **Scalable Cooling for High-Density Racks**

Another key differentiator of Delta Cube technology is its ability to cool racks with power densities of up to 50kW per rack. This makes it ideal for companies working with AI, machine learning, blockchain, or IoT applications that generate large amounts of heat and require sustained performance.

3. **Energy Efficiency**

Delta Cube is designed to reduce energy consumption, making it a preferred choice for data centers looking to meet sustainability goals. By optimizing air distribution and cooling where it's most needed, this system ensures that energy is not wasted on overcooling less active areas, significantly reducing the Power Usage Effectiveness (PUE) metric in data centers.

4. **Eco-Friendly Design**

In addition to its waterless operation, Delta Cube employs advanced technologies that optimize cooling based on real-time workloads, adjusting airflows dynamically to

like LEED or Energy Star.

5. **Optimized for AI and HPC**

With the rise of artificial intelligence (AI) and high-performance computing (HPC), the need for robust and energy-efficient cooling solutions has never been more critical. Delta Cube cooling is uniquely positioned to support these advanced workloads by offering high-density rack cooling with the ability to dissipate heat quickly and efficiently, allowing for continuous operation without thermal throttling.

How Advanced Cooling Fits into Modern Data Center Design

As compute demands grow, data centers are evolving to support more powerful equipment, such as high-performance servers and blade servers, which are capable of handling greater workloads. These systems generate significantly more heat, making traditional cooling methods less effective.

Efficient cooling technologies like Delta Cube³ are designed to handle these rising demands by optimizing airflows and heat dissipation across the entire rack, maintaining optimal performance without overheating.

Additionally, many data centers are being built or retrofitted to support edge computing, often involving placing data centers closer to end-users to reduce latency. These edge facilities still require the ability to handle high-density workloads, and Delta Cube offers the perfect cooling solution for these distributed environments.

At Netrality Data Centers, Delta Cube³ cooling is deployed to support our Shawnee, Kansas, data center, which serves critical industries such as healthcare, financial services, and manufacturing. Delta Cube makes high-density configurations possible, ensuring that our customers can scale their operations without worrying about energy inefficiencies or overheating.

Delta Cube vs. Traditional Cooling Systems

Comparing Delta Cube to traditional cooling methods helps illustrate its efficiency:

- Legacy cooling systems often rely on raised floors and chilled water systems, which consume more energy. water, and are less flexible when it comes to handling variable workloads.
- Delta Cube³, in contrast, offers a waterless, air-based cooling system that adjusts airflow dynamically, delivering cool air exactly where it's needed.
- Delta Cube³ cooling outperforms traditional systems by handling temperature differences (Delta-T) up to 45°F, enabling it to cool significantly hotter air more efficiently, compared to the 3-7°F heat exchange typical of conventional air-cooled systems.

This combination of targeted cooling and adaptive performance ensures a significant reduction in both energy costs and the environmental footprint of your data center.

Scalability and Future-Proofing with Advanced Data Center Cooling

As technology evolves, businesses require infrastructure that can scale effortlessly. The flexible nature of Delta Cube cooling ensures that data centers can expand their capacity without significant upgrades to the cooling system.

technology addresses these needs by offering future-proof cooling capabilities that align with modern workloads and business requirements.

Delta Cube's Role in Sustainability Initiatives

Many data centers, particularly those aiming for carbon neutrality or energy efficiency certifications, focus on sustainability. Delta Cube's eco-friendly design helps these centers achieve these goals while continuing to support high-density deployments.

Furthermore, Delta Cube contributes to the circular economy by reducing the need for excessive water usage and lowering overall energy consumption, reducing greenhouse gas emissions. Data centers incorporating this technology are better positioned to meet corporate sustainability initiatives and government regulations regarding energy usage and carbon footprints.

Use Cases for Delta Cube Data Center Cooling Technology

Here are a few specific use cases where Delta Cube shines:

01. **AI and Machine Learning Workloads**: AI and machine learning require substantial computing power, often leading to increased heat generation. Delta Cube ensures these systems run at peak performance without energy wastage.
02. **Edge Computing**: With edge computing, data centers need to process information closer to the end-user. Delta Cube's modular cooling approach fits well within edge data centers where scalability and efficiency are paramount.
03. **Blockchain and Cryptocurrency Mining**: The power-intensive nature of blockchain technologies demands robust cooling systems. Delta Cube supports these high-density workloads while keeping energy consumption in check.
04. **Financial Services and Trading Firms**: Companies in financial services often rely on data centers to ensure the latency-sensitive processing of transactions. Delta Cube ensures that high-density server racks supporting trading applications remain cool, operational, and cost-effective.

Conclusion: Powering the Future with Delta Cube Cooling

As the demand for more computing power continues to rise, data centers need to find ways to scale efficiently while keeping energy costs under control. Delta Cube cooling technology is a crucial component for high-density data centers, offering a powerful, scalable, and eco-friendly solution that supports modern workloads such as AI, machine learning, edge computing, and blockchain.

Netrality's deployment of Delta Cube technology ensures that businesses can grow without worrying about the limitations of traditional cooling methods. Whether you're handling high-performance applications or preparing for future tech innovations, Delta Cube is an ideal solution for cooling your high-density data center.

Want to learn more about how Delta Cube technology can optimize your data center operations? Contact **Netrality Data Centers** today to explore how our **Delta Cube-powered facilities** can meet your growing infrastructure needs.

Learn More

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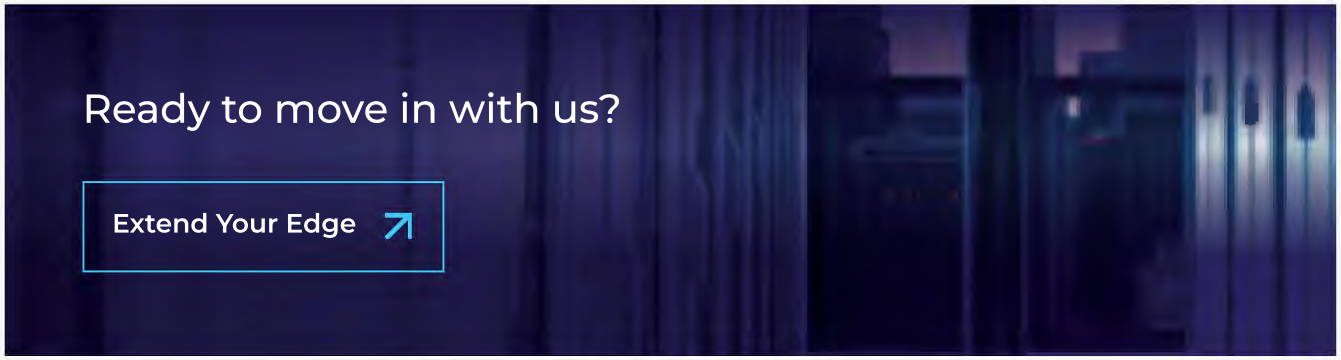

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