

Docket No. 20000-633-ER-23
Witness: Amparo Nieto

BEFORE THE WYOMING PUBLIC SERVICE
COMMISSION

ROCKY MOUNTAIN POWER

Rebuttal Testimony of Amparo Nieto

September 2023

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, location, and employer.**

3 A. My name is Amparo Nieto (Maria Desamparados Nieto-Hernandez), and I am a
4 Principal at Charles River Associates (“CRA”)’s energy practice. My office is located
5 in Los Angeles, California.

6 **Q. On whose behalf are you submitting this rebuttal testimony?**

7 A. I am submitting this rebuttal testimony before the Wyoming Public Service
8 Commission (“Commission”) on behalf of PacifiCorp d/b/a Rocky Mountain Power
9 (“RMP” or the “Company”).

10 **Q. Briefly describe your education and business experience.**

11 A. I am an economist with over 25 years of experience in the energy industry. I advise and
12 provide expert witness services in the electricity and natural gas industries in matters
13 of regulatory policy, wholesale markets and retail tariff designs. I have extensively
14 worked with utilities and energy commissions on the development of marginal cost-
15 based electricity and natural gas rates. These rate designs have included enhanced time
16 of use (“TOU”) rate options, dynamic rates, and other pricing structures that improve
17 efficiency of customer usage and investment decisions, including decisions to adopt
18 behind-the-meter solar, energy storage, electric vehicles and other distributed energy
19 resources (“DERs”). I have also been advisor to independent system operators and
20 energy regulatory commissions in the United States, Spain, Australia, and Ireland
21 regarding rules for effective competition in wholesale and retail markets, and
22 transmission open access. I hold a Masters’ degree in Economic Analysis and Public
23 Finance from the Madrid Institute for Fiscal Studies, in Madrid and a Bachelor’s

1 Degree in Economics from the University of Carlos III of Madrid, Spain. My
2 curriculum vitae is set forth in Exhibit 15.1.

3 **Q. Have you testified in previous regulatory proceedings?**

4 A. Yes. I have filed testimony in Maine, Nevada, New York, North Carolina, Minnesota,
5 North Dakota, New Hampshire, Arizona, and in the Canadian province of New
6 Brunswick.

7 II. PURPOSE OF TESTIMONY

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

9 A. My testimony reviews and provides opinion regarding the analysis and conclusions
10 presented by Wyoming Industrial Energy Consumers (“WIEC”) witness Mr. Bradley
11 G. Mullins in his direct testimony. In his testimony, Mr. Mullins alludes to
12 discriminatory rate treatment by RMP against its own native loads, i.e., retail customers
13 (the industrial, commercial and residential customers), and in favor of wholesale
14 customers for the provision of frequency regulation, spinning reserves and
15 supplemental reserves. Wholesale (“non-native”) customers pay for these services
16 based on the Federal Energy Regulatory Commission (“FERC”)-approved Open
17 Access Transmission Tariff (“OATT”) rates, Schedules 3, 3A, 5, and 6 respectively.
18 Retail customers pay for these services as part of their bundled electricity rates,
19 approved by the Wyoming Public Service Commission.

20 III. BACKGROUND

21 **Q. Please elaborate on WIEC’s claims of discrimination in his testimony.**

22 A. Mr. Mullins’s position is that the level of revenues being collected by the Company
23 from non-native loads or non-native generation (“non-native customers”) through

1 FERC-approved ancillary services rates is lower than RMP's full opportunity cost of
2 providing these services.¹ In his effort to demonstrate these opportunity costs,
3 Mr. Mullins relies on a modified scenario of Aurora modeling that aims to approximate
4 the change in wholesale energy revenue that the Company could possibly receive for
5 making available the corresponding capacity into a market, in lieu of providing
6 regulation and operating reserves for its non-native customers. This in concept, is
7 equivalent to how competing suppliers of operating reserves in fully competitive
8 markets expect to receive compensation for their availability to standby ready to
9 provide those services in lieu of energy. However, this concept is inapplicable to RMP
10 as I discuss below.

11 **Q. Does Mr. Mullins provide the hypothetical revenues that RMP could receive if it**
12 **sold the operating reserves into an hourly energy ancillary services market?**

13 A. No. Aurora does not provide that value. Therefore, Mr. Mullins has computed what
14 could be considered a crude proxy of a shadow value, based on the simulation of a
15 scenario that removes the regulation and operating reserves that the Company is
16 expected to provide to non-native customers in the test year. After removing regulation
17 and operating reserve requirements for non-native customers, estimated by WIEC to
18 be 89 megawatts of reserves, his modeling computes the potential foregone energy
19 sales revenue for RMP generating units associated with reduced energy sales in the

¹ Direct Testimony of Bradley G. Mullins at 65 (WIEC Exhibit No. 202).

1 market. Based on the results of his modeling, he infers that RMP retail customers
2 subsidize non-native customers for these services.²

3 **Q. Could you further describe how Mr. Mullins arrives to the conclusion that RMP**
4 **retail customers are subsidizing non-native customers for Ancillary Services?**

5 A. Mr. Mullins first identifies the impact of the modeling of non-native reserve
6 requirement scenario on the Company's net power costs ("NPC"), relative to the
7 Company's NPC forecast. The net effect of these changes is a reduction of \$211 million
8 in NPC on a total-Company basis, with approximately \$29 million allocated to
9 Wyoming customers. Mr. Mullins then assumes that the delta in NPC reflects the cost
10 attributable to non-native customers. Finally, he compares this NPC differential with
11 the annual revenues that the Company receives from FERC OATT rates for Ancillary
12 Services from non-native customers, which amount to \$12.2 million. The difference
13 between these two amounts, in WIEC's view, represents the amount that should be
14 considered a subsidy to non-native customers that is borne by RMP's retail customers.
15 Mr. Mullins uses this result to argue for a large credit (or a disallowance) in the retail
16 revenue requirement for these services.

17 **Q. What is the relationship between the drop in forecasted NPC and the alleged**
18 **subsidy?**

19 A. The revenue amount received from FERC Ancillary Services rates is credited in the
20 Company's embedded costs allocation studies, Mr. Mullins infers that FERC revenue

² *Id.*, at 63 (WIEC Exhibit No. 202) ("I prepared a modified NPC forecast that excluded the reserves associated with providing FERC jurisdictional contingency reserves services to non-native loads and resources under OATT ancillary service Schedules 5 and 6. I also prepared a modified NPC forecast that excluded the reserves associated with providing FERC jurisdictional regulation reserve services to non-native loads and resources under OATT ancillary service Schedules 3 and 3A. Based on those scenarios, I performed a comparison between costs RMP included in its NPC forecast for non-native loads and resources and associated ancillary service revenues included in revenue requirement.").

1 is too low, and therefore he considers that the retail share of the overall ancillary
2 services revenue requirement is inappropriately high.

3 **Q. Is Mr. Mullins' calculation of his proposed Aurora adjustment accurate?**

4 A. No. Company witness Ramon J. Mitchell explains how Mr. Mullins's Aurora
5 calculation, and its impact to NPC, is erroneous. For further background, Aurora is a
6 production cost model that simulates the least-cost dispatch of the system, based on
7 forecasts of hourly demands and individual resource operating characteristics in a
8 transmission-constrained algorithm. The Company's modeling includes forward
9 energy market price information as an input into the simulation. The inclusion of these
10 forward energy market prices, makes Aurora useful for determining the forecast of the
11 Company's fuel, purchased power costs, and wholesale energy sales revenue.

12 **Q. Setting aside inaccuracies in Mr. Mullins's calculation, do you find any conceptual
13 problems with WIEC's approach to identifying a misallocation of costs to non-
14 native customers?**

15 A. Yes, I do. WIEC's witness is misusing the well-known economic concept of
16 opportunity costs. This concept reflects the forgone profit of an alternative option that
17 is available to a firm but is ultimately not chosen. RMP does not have the option to
18 monetize a hypothetical alternative use of its generation resources other than for
19 satisfying its obligation to provide both native and non-native operating reserve
20 requirements. In other words, Mr. Mullins implies the Company could receive revenues
21 that RMP cannot actually receive from the energy market. Mr. Mullins is also ignoring
22 that Aurora's simulation is not able to properly emulate market prices for ancillary
23 services that would otherwise be revealed in a fully competitive setting. RMP is not in

1 a Regional Transmission Organization (“RTO”) where competing Ancillary Services
2 suppliers are able to bid a price and quantity into day ahead and real-time markets, and
3 where hourly (or sub-hourly) market prices reveal the true opportunity costs for the
4 capacity that the generator makes available for operating reserves.

5 Thus, in an RTO context, quantification of supplier’s opportunity costs is a
6 critical component of ancillary services market-price setting, to determine which units
7 are selected for the service and at what price, in alignment with the intra-day regional
8 system changing conditions. But it is not directly applicable in the current regulatory
9 setting of RMP. There is no sound basis or economic justification to undertake an
10 approximation of the opportunity costs of reserves corresponding to the wholesale
11 loads. For all these reasons, Mr. Mullins’s modeling is of no valid use to determine an
12 efficient and equitable breakdown between RMP’s revenue requirement for native
13 versus non-native customers.

14 **Q. Is RMP required to sell at FERC rates?**

15 A. Yes. FERC Order 888 required all incumbent utilities that serve as transmission
16 providers, including RMP, to charge wholesale customers for wheeling services based
17 on a pro-forma tariff, as per its OATT. These services include transmission and
18 Ancillary Services. The rates for these services are approved by FERC at the embedded
19 allocated cost of providing this service, on a similar fashion to the way that rates are
20 set by the Wyoming Commission for retail service. As customers of the utility, non-
21 native customers must pay the FERC OATT rates. As a result, Mr. Mullins’ claim that
22 the Company’s wholesale pricing of operating reserves is misaligned with its true *net*
23 *cost impact* is irrelevant, because it is detached from the reality of the regulated

1 environment that RMP operates under. His modeling mischaracterizes both the
2 availability of optional revenue streams to RMP, and the federal provisions pertaining
3 to Utah, Idaho, and Wyoming.

4 **Q. Could you explain further why WIEC’s conclusions are unsupported given its**
5 **current regulatory requirements?**

6 A. Yes. Mr. Mullins appears to ignore that the states where RMP operates did not undergo
7 deregulation as other states such as California or New York did.³ As such, RMP is not
8 an active player in a competitive regional market. Instead, RMP is subject to a trading
9 model that is termed in energy regulatory economics as ‘wheeling trading’. Under this
10 model, a vertically-integrated utility such as RMP, is responsible to ensure adequate
11 power to supply native load’s needs with its own generation resources and only incurs
12 in wholesale purchases in hours when it is economically efficient to do so. RMP, at the
13 same time, must ensure that it provides transmission access, congestion management
14 and other system operating services to *all users* of its transmission grid, in a non-
15 discriminatory manner, under the FERC oversight. It must ensure that the Balancing
16 Authority Areas (“BAAs”⁴) reliably balance all loads and resources, and provide
17 Ancillary Services to support the transmission of energy from all resources to loads, in
18 compliance with applicable North American Electric Reliability Corporation
19 (“NERC”) reliability standards. These standards and their importance are explained in
20 greater detail by Company witness Mr. Michael G. Wilding. To fulfill its obligations,
21 RMP must hold reserves for both native and non-native customers. Most of RMP’s

³ While PacifiCorp serves California, it remains a fully-regulated vertically integrated utility in its service territory.

⁴ PacifiCorp operates two BAAs in the Western Electricity Coordinating Council (“WECC”) NERC region, PacifiCorp East (“PACE”) and PacifiCorp West (“PACW”).

1 non-native customers do not self-supply reserves; they purchase these services from
2 RMP. The non-native customers include generators and retail loads of other utilities in
3 the BAAs.

4 **Q. Please explain the principles that govern determination of FERC cost-based rates**
5 **for use of the transmission grid.**

6 A. FERC oversees access and pricing for the grid services provided. It ensures that the
7 utility sets non-discriminatory cost-based tariff rates, meaning RMP can only recover
8 embedded costs plus an authorized rate of return as determined by FERC. The
9 Company is therefore setting FERC rates for Ancillary Services based on the same
10 fundamental principle that applies to FERC tariff rates for transmission services
11 provided to both non-native loads and native loads. There are a number of objectives
12 that FERC has stated regarding the approach to set OATT rates. One of the key
13 principles in setting rates is ensuring that the users of the grid (i.e., those that are buying
14 these services from the transmission provider) are not being charged unjust,
15 unreasonable or unduly discriminatory or preferential rates. Such a situation would
16 exist where the transmission provider has market power and is able to take advantage
17 of a dominant position. A transmission provider outside of an RTO, such as RMP, is
18 required to set cost-based rates to ensure that this non-discriminatory principle is met.
19 FERC has stated that there needs to be a competitive auction, with sufficiently large
20 geographical scope to maximize efficient competition and enable competitive pressure

1 to set prices not just for energy but also reserves, as a necessary condition to remove
2 cost-based provision of operating reserves.

3 **Q. Are the rates that RMP sets for OATT rate Schedules 3, 5 and 6 for providing**
4 **Ancillary Services consistent with common cost-allocation methods under FERC?**

5 A. Yes. FERC has approved specific formula methodologies for calculating Schedules 3,
6 5 and 6 rates based on an average, embedded cost calculation method. I have reviewed
7 these calculations for RMP, and can confirm that they are based on long-standing FERC
8 practice of charging for services, consistent with the methods applied by other utilities
9 in a similar non-RTO environment such as those in Nevada and other states. Essentially,
10 the Company follows common practice among utilities that are operating outside of an
11 RTO. The rates for Schedules 3, 5 and 6 are typically calculated based on FERC-
12 developed methodology known as the “Units Most Likely” method.⁵ The method uses
13 the revenue requirement for a given test year, in the form of a weighted cost per kilowatt
14 that takes into account the plants that are most likely to provide the service. The steps
15 used in this calculation were documented by Dr. Paul A. Dumais, pages 8 and 9 of his
16 direct testimony, Exhibit No. PAC-0011.⁶ The ordering of generating units in this
17 exercise aims to replicate the normal dispatching order of the facilities for purposes of
18 providing reserves, i.e., recognizing that those lower cost facilities that operate at high
19 capacity factors have limited ability to provide regulation and reserve services. Just like
20 state retail rates, this revenue requirement is based on the accounting data for these
21 costs, not an estimate of forward-looking market value, or other opportunity costs.

⁵ See, Stacking of Generating Units to Determine the Units Likely to Participate in Short Term Power Sales, available at <http://www.ferc.gov/industries/electric/geninfo/mbr.asp> (under “Quick Links” follow “Blank Stack Analysis” hyperlink).

⁶ See, FERC Docket No. ER21-1015.

1 **Q. Could you please summarize your main conclusions and assessment regarding**
2 **WIEC's arguments of discrimination?**

3 A. Yes. WIEC's comparison of change in modelled NPC and FERC revenue does not have
4 any practical interpretation or impact for pricing purposes. It wrongly assumes that the
5 utility can provide these ancillary services competitively. This is erroneous and not
6 justified in the current regulatory and market paradigm. The ancillary services revenue
7 that RMP is entitled to receive from wholesale loads is not comparable to any revenue
8 from either energy or reserve sales that the Company could realize in the marketplace.
9 RMP does not act as a profit-maximizing entity that is free to apply rate discrimination
10 for provision of ancillary reserves to non-native customers based on an estimation of
11 opportunity cost across all hours of the day and/or each customer's willingness to pay
12 for reserves. This does not reflect RMP's operations in the states where RMP operates.
13 WIEC is conflating the concept of opportunity cost of providing regulation and
14 operating reserves, with the Company's ability to make marginal wholesale energy
15 sales into the market after reliably meeting retail customers demands. As a transmission
16 provider, RMP is required to meet the demand of non-native customers and cannot
17 apply price discrimination. Instead, it must use (and has done so) FERC-approved
18 method to establish regulated, embedded cost-based rates which is consistent with the
19 approach used by other utilities that are not members of an RTO.

20 **Q. Does this conclude your rebuttal testimony?**

21 A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION OF WYOMING

IN THE MATTER OF THE) APPLICATION OF ROCKY) MOUNTAIN POWER FOR) AUTHORITY TO INCREASE ITS) RETAIL ELECTRIC SERVICE RATES) BY APPROXIMATELY \$140.2) MILLION PER YEAR OR 21.6) PERCENT AND TO REVISE THE) ENERGY COST ADJUSTMENT) MECHANISM)	DOCKET NO. 20000-633-ER-23 (RECORD NO. 17252)
--	--

AFFIDAVIT, OATH AND VERIFICATION

Maria Desamparados Nieto-Hernandez, a.k.a. Amparo Nieto (Affiant) being of lawful age and being first duly sworn, hereby deposes and says that:

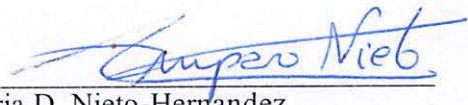
Affiant is a Principal at Charles River Associates who has filed testimony on behalf of PacifiCorp d/b/a Rocky Mountain Power, which is a party in this matter.

Affiant prepared and caused to be filed the foregoing testimony. Affiant has, by all necessary action, been duly authorized to file this testimony and make this Oath and Verification.

Affiant hereby verifies that, based on Affiant's knowledge, all statements and information contained within the testimony and all of its associated attachments are true and complete and constitute the recommendations of the Affiant in their official capacity as a Principal with Charles River Associates.

Further Affiant Sayeth Not.

Dated this 23 day of September, 2023

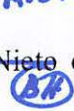


Maria D. Nieto-Hernandez
Principal, Charles River Associates

STATE OF CA)
) SS:
COUNTY OF Los Angeles)



The foregoing was acknowledged before me by Amparo Nieto on this 23 day of September, 2023. Witness my hand and official seal.



Benjamin Herrera, Notary Public
Notary Public

My Commission Expires:
May 30, 2027

**PLEASE SEE CALIFORNIA
NOTARY CERTIFICATE**

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of LOS ANGELES)

On SEPTEMBER 23, 2023 before me, BENJAMIN HERRERA, NOTARY PUBLIC
(insert name and title of the officer)

personally appeared MARIA D. NIETO-HERNANDEZ,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same in
his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing
paragraph is true and correct.

WITNESS my hand and official seal.



Signature 

(Seal)

Rocky Mountain Power
Exhibit 15.1
Docket No. 20000-633-ER-23
Witness: Amparo Nieto

BEFORE THE WYOMING PUBLIC SERVICE
COMMISSION

ROCKY MOUNTAIN POWER

Exhibit Accompanying Rebuttal Testimony of Amparo Nieto

Amparo Nieto Curriculum Vitae

September 2023



Amparo Nieto

Principal

Amparo Nieto is an economist with over 25 years of advisory and testifying experience in the energy and utilities field. Her extensive knowledge of markets, electricity ratemaking, and best-practice regulatory policies allows her to successfully provide economic analysis of a broad range of energy regulatory policy issues. She works with investor-owned utilities, municipal utilities, public utility commissions, as well as independent firms and system operators.

Ms. Nieto has filed expert reports and testified on behalf of electric utilities before state public commissions in matters of marginal cost of service studies, optional time-of-use rates, dynamic pricing options, net energy metering, distributed energy resources (DERs). She has designed marginal cost-based rates, energy storage rates, and has recommended revisions to pricing models to ensure a sustainable transition to a decarbonized energy sector.

In 2021-22, Ms. Nieto was a key advisor to the California Public Utilities Commission as part of the state-wide proceeding to reform the legacy net energy metering (NEM) mechanism. The goal was to ensure that compensation of rooftop solar and battery storage was more closely aligned with the value these resources provide to the system, as well as enabling the proper transition through retail rates. Early in her career, Ms. Nieto was advisor to independent system operators and energy regulatory commissions in the United States, Spain, Australia, and Ireland. She was actively involved in the development of rules for effective wholesale and retail competition/transmission open access. For many years, she has directed a membership-based utility working group that discusses rate innovation and regulatory models.

Overview of recent Rates, Cost of Service, and Regulatory assignments

- **NV Energy, Nevada: Expert witness in Nevada Power rate case**
Reviewed the Company's marginal distribution cost-of-service methods and embedded cost of service study methods and recommended improvements to best reflect best practice, as well as for use in rate design proposals. Provided direct testimony before the Nevada Public Utilities Commission.
- **Avangrid, NYSEG and RG&E, New York: Expert witness**
Conducted marginal distribution cost-of-service studies and recommended use of results for improvements to distribution rate designs during the companies' rate cases. Supported the utility in the development of distribution marginal cost estimates to compensate DERs for their value to the distribution grid, as directed by the Commission VDER Order within the Reforming the Energy Vision (REV) proceeding.
- **Eversource, MA, CT: Support the design of a residential Time of Use EV rate and a wholesale energy storage rate. Advised on appropriate, time-differentiated rate structures and led the underlying probability of peak cost analysis for the Company for MA and CT.**

- **Central Maine Power Company, Maine: Expert witness**
Advised and served as expert witness during the company's electric rate case. Conducted a marginal cost of distribution study and supported the design of enhanced time-of-use (TOU) distribution rate designs for as well as recommendations on innovative pricing for all customer classes.
- **California Public Utilities Commission: Net Energy Metering Reform**
Led the team that provided advisory support and modelling to the energy division of the CPUC with regard to the reform of the CA utilities' net energy metering (NEM 3.0) program for behind the meter solar generation and battery storage. Co-authored a white paper on designing more efficient rates and compensation of solar exports to the grid that are more aligned with the value of solar to the system and therefore reduce cost shifting to non-solar customers under the existing net energy metering (NEM) in California. Reviewed stakeholders' testimony and alternative proposals and developed recommendations for the Commission, leading to a Decision on NEM reform.
- **San Diego Gas & Electric, California: Residential rates**
Provided recommendations on changes to the company's residential rates for more cost-reflective price signals and optional tiered-fixed charges that will support efficient electrification adoption. Designed fixed charges that vary with customer size and include specific discounted rates for qualifying low-income customers.
- **Eversource Energy, New Hampshire: TOU electric vehicle rate design**
Designed a proposal for a TOU Electric Vehicle rate design and an enhanced TOU whole-house rate design. Worked closely with the Company to develop an alternative rate design for DC fast charging stations. Conducted and testified on a generation, transmission, and distribution marginal cost analysis under the 2018 NH Net Metering docket and filed testimony as cost of service witness as part of the utility's 2020–21 Distribution Rate Case marginal cost study, and embedded cost of service study. Provided recommendations to improve the utility's current time of use and non-time of use electricity rate structures, and the allocation of revenue requirement to each rate class.
- **Sacramento Utility Municipal District, California: Net metering modeling**
Lead team that developed modelling for the utility as part of the design of a package of measures that will replace existing net energy metering and provide cost-effective integration of solar generation and battery storage into the utility's service territory. Recommended revisions to electricity rates including improved TOU rates and potential critical peak price (CPP) residential rate as an option for export compensation as well as for on-site usage of solar power, to replace traditional net metering.
- **Salt River Project, Arizona: Marginal cost of service study and net metering rate design**
Reviewed SRP's marginal cost of service study and provide recommendations for improvement in approaches. Reviewed SRP's proposed Residential Customer Generation Price Plan (E-27) and authored expert report with opinion on the soundness of the proposal. Presented opinion before the SRP's Board of Directors during on-site hearings.

- APS Aggregation Tariff, Arizona: Recommended an aggregator tariff structure for demand side resources, including distributed solar, energy storage, and demand response technologies, as part of a stakeholder process.
- Nova Scotia Power, Canada: Lead the modelling of marginal costs of distribution and analysis of value streams that will contribute to residential energy storage.
- NYSEERDA, New York: Development of alternative rate options in modelling of cost impacts of electrification goals.
- Xcel Energy, Minnesota: Retained by Xcel Energy to conduct a cost analysis that would help decide on the minimum fixed charge that residential rates should include in order to recover the marginal costs of connection to the grid, meter and service. Review company's decoupling proceedings.
- NV Energy, Nevada: Provided testimony before the Public Service Commission of Nevada regarding NV Energy's proposed changes to Sierra Pacific's residential rates for customers with distributed generation, which were billed under net metering. Reviewed the necessary changes to the utility's marginal cost methods in light of the interconnection of Nevada Power and Sierra Pacific transmission systems.
- UK Energy Networks Association, UK. Advisor to the Association on evaluating a potential reform of electricity distribution network planning standards to account for new developments, such as the emergence of smart grids.
- Grid Australia, Sydney, Australia. Advisory services regarding Performance-Based Regulation (PBR) methods for electricity network.
- Edison Electric Institute (EEI), US. Co-author of report "Making a Business of Energy Efficiency: Sustainable Business Models for Utilities". A report on regulatory mechanisms to strengthen utility incentives to launch energy efficiency and demand response programs.
- Regulatory Office for Network Industries (RONI), Slovakia. Directed the team that assisted the Slovakian regulatory commission on the design of efficient support mechanisms for renewable energy sources (RES) and a reliable system of issuing guarantees of origin for RES. Trained the commission staff on best practice RES regulation.
- Commission for Energy Regulatory of Ireland, Ireland. Participated in the drafting of the all-island electricity market rules and recommended changes to the Transmission Use of System (TUoS) charges for the Republic of Ireland.
- Illinois Power Agency (IPA), US. Assessment of parameters and benchmark analysis for Solar Renewable Energy Credits (SRECs) in the context of the auction held by Ameren Illinois Company and Commonwealth Edison to procure RECs from solar distributed generation resources.

- Manitoba Hydro, Manitoba, Canada. Provided training to the utility staff on methods to estimate marginal costs in the context of rate design. In an earlier assignment, advised Manitoba Hydro on electricity tariff reform to introduce Time-Of-Use rates and inverted-block rates in Manitoba. Analysed marginal energy costs by time-of-day periods; developed the welfare and cost-benefit models that took into account a range of price elasticity by class and the potential load shifting due to new TOU rate structures and the impact on net welfare. Co-authored the study report for submission to the Manitoba Public Utility Board.
- Newfoundland Labrador & Hydro, Newfoundland, Canada. Participated in a study of the marginal cost of generation and transmission for the vertically-integrated utility in Newfoundland, for use in development of Time-of-Use rates.
- BC Hydro, Canada. Developed marginal cost estimates of generation, transmission and distribution to support BC Hydro's upcoming rate case and provided recommendations on use of study results to redesign rates, including setting up Time of Use residential and commercial rates.
- Newfoundland Power, Newfoundland, Canada. Managed the team developing a generation and transmission marginal cost of service study, which included projections for 2007-2025 for use in Demand-Side-Management efforts.
- Tennessee Valley Authority (TVA), TN, US. Conducted a generation and transmission marginal cost of service study for TVA to be used for rates and to evaluate demand response programs.
- Southern Company, US. Reviewed the company's proposed approach to undertake loss of load expectation analysis and recommended improvements. Provided guidance to develop capacity cost allocation factors for demand response programs and new customer evaluation.
- NB Power, New Brunswick, Canada. Recommended approach to estimate the incremental costs to the utility when customers opt-out of smart metering, taking into account the pace of smart meter deployment plans. Provided rate design recommendations in the light of smart grid investments.
- Barbados Federal Trade Commission, Barbados. Directed the team advising the Barbados energy regulatory commission during Barbados Power and Light (BP&L)'s rate application. Assessed the utility's estimated cost of capital, embedded and marginal electricity cost methods used by the utility to allocate costs to customer classes and various proposed rates including time of use rate proposals.
- Electricity Regulatory Board (ERB), Kenya, Africa. Co-authored an Electricity Tariff Policy for ERB, aimed at improving the financial health of the sector and promoting the efficient expansion of electricity service. Developed financial models for calculation of utility revenue requirement and provided on-site training to the ERB staff on regulatory analysis and marginal cost studies. Designed the pricing terms of a new sample Power Purchase Agreement between the incumbent generator (KenGen) and the distribution utility (KPLC).

- Abu Dhabi, UEA. Advised on the reform of distribution rates and suitable mechanism to undertake cost allocation based on marginal costs. Proposed revision to existing electricity cross-subsidies.

Overview of selected wholesale market design, industry restructuring, and power contract review assignments

- Commission for Energy Regulatory of Ireland, Ireland: Member of the market design team for the all-island electricity market. Key consultant in the design of options for a Capacity Payment Mechanism on the island of Ireland that would be viable and sensible in the context of the Irish electricity market.
- MidAmerican Energy Company, Iowa. Directed the team in charge of reviewing and advising MidAmerican Energy Retail branch's as part of their market strategy and bidding, and load forecasting procedures, as part of their activity in ERCOT, MISO and PJM electricity wholesale market rules. Provided recommendations and training to the team on resource adequacy and transmission open access tariffs.
- Australian Energy Market Commission, Australia. Critiqued the proposed revisions to the electricity market rules in Australia regarding firm transmission access and rights. Analyzed the suitability of Financial Transmission Rights, or their equivalent, for the Australian market. Conducted a survey of international transmission planning and cost-allocation methodologies in an earlier assignment.
- Alberta Electric System Operator (AESO), Calgary, Alberta. Analyzed AESO's cost study and transmission cost recovery methods, recommended improvement to wholesale rates for ancillary services and recommended revisions to cost allocation.
- NYISO, New York, US. Provided recommendations to the New York Independent System Operator for a reform of their Black Start service compensation mechanism as part of the ISO Tariff.
- Independent System Operator (ISO) of New England, US. Member of the team advising the ISO-NE on revisions to ISO's Forward Capacity Market (FCM), with regard to the *Alternative Capacity Price Rule*.
- Southern California Edison, Los Angeles, California, US. Member of the team that advised the utility's Supply Group on improvements to the mechanism for contracting with renewable generation resources.
- Ministry of Energy (SENER), Mexico: Advisor to SENER regarding the development of a procurement auction to procure multiple renewable technologies across a variety of time-frames.
- Spanish National Energy Commission (CNE), Madrid, Spain. Administered the default service electricity supply ("CESUR") auctions on behalf of the large distribution companies in Spain and Portugal. Assessed the bidders' competitive behavior during the auctions and prepared an assessment report for the Commission.

- Ministry of Energy, Argentina. Undertook a comprehensive review of the Argentine wholesale electricity market rules and co-authored a report for the government on proposed measures to increase competition.
- Iberdrola, Spain Member of the energy practice team advising a large Spanish electric utility regarding its regulatory strategy at the time of the electricity sector in Spain as well as advise in a broad range of regulatory issues involving retail access, stranded cost analysis and open access tariffs. Participated in industry working groups in charge of proposing detailed policy rules.
- Commission for energy regulation, Spain. Advised the Commission during the drafting of major energy sector restructuring legislation opening the sector to competition; wholesale energy market and capacity payment design.

Expert testimony

Before the Nevada Public Utilities Commission, direct expert testimony, "Nevada Power Company, Review of Electricity Marginal Cost Study, Embedded Cost Study and Time of Use Periods," June 6, 2023.

Before the Maine Public Utilities Commission, direct testimony, "Central Maine Power Company, "Electricity Marginal Cost Study and Efficient Rate Design," August 11, 2022.

Before the New York State Public Service Commission, direct testimony, "New York Electric Service and Gas and Rochester Gas & Electric Corporation, Electricity Marginal Cost Study and Rate Designs," May 26, 2022.

Before the New York State Public Service Commission, direct testimony, "New York Electric Service and Gas and Rochester Gas & Electric Corporation, Natural Gas Marginal Cost Study," May 26, 2022.

Before the New York State Public Service Commission, direct testimony, "New York Electric Service and Gas and Rochester Gas & Electric Corporation, Streetlighting Replacement Cost Study," May 26, 2022.

Before the New Hampshire Public Utilities Commission, filed report on the design of a new EV residential rate, on behalf of the Public Service Company of New Hampshire d/b/a Eversource Energy, May 15, 2021.

Before the New Hampshire Public Utilities Commission, rebuttal testimony, "Cost of Service Studies and Rate Design," on behalf of the Public Service Company of New Hampshire d/b/a Eversource Energy, March 3, 2020.

Before the New Hampshire Public Utilities Commission, direct testimony, "Marginal Distribution Cost of Service Study and Implications for Rate Design," on behalf of Eversource Energy, May 28, 2019.

Before the New Hampshire Public Utilities Commission, direct testimony, "Allocated Cost of Service Study," on behalf of the Public Service Company of New Hampshire d/b/a Eversource Energy, May 28, 2019.

Before the North Dakota Public Service Commission, marginal cost of service study on behalf of Otter Tail Power Company, June 2018.

Before the Public Utilities Commission of Nevada, rebuttal testimony, "Marginal Costs, Revenue Reconciliation and Rate Design for Net Metering Customers," in the Matter of the Application of Sierra Pacific Power Company d/a/a NV Energy for Authority to Reform Rates for Electric Utility Service in 2016 GRC, October 31, 2016.

Before the Public Utilities Commission of the State of Minnesota, rebuttal testimony, "Fixed Charges, Marginal Cost Study, and Rate Design," September 12, 2016.

Before the Public Utilities Commission of the State of Minnesota, direct testimony, "Fixed Charges and Rate Design Policy," in the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in Minnesota, February 16, 2016.

Before the Board of Directors of Salt River Project, testimony regarding analysis of SRP's adoption of a new net metering rate E-27 for solar customers. November 2015.

Before the New York State Public Service Commission, direct testimony, "Rochester Gas & Electric Corporation Electricity and Natural Gas Marginal Cost of Service Studies," June 2015.

Before the New York State Public Service Commission, direct testimony. "New York State Electric and Gas Electricity and Natural Gas Marginal Cost of Service Studies," June 2015.

Before the Salt River Project Board of Directors, testimony, "Review of SRP Proposed Residential Customer Generation Price Plan," February 2015.

Before the State of North Carolina Utilities Commission, testimony, "Review of Alternative Application of the Peaker Method Proposed by EPCOR USA North Carolina LLC with respect to Computation of Avoided Energy and Capacity Costs," July 23, 2010.

Before the New Brunswick Board of Commissioners of Public Utilities, testimony, with Wayne Olson, "The Role of DSM and Demand Response in Load Forecasting and Integrated Resource Planning," on behalf of the New Brunswick Public Intervener, November 9, 2006.

Publications

- Alternative Ratemaking Mechanisms for Distributed Energy Resources in California. Successor Tariff Options Compliant with AB 327. A white paper commissioned for the California Public Utility Commission. January 28, 2021.
- Rate Design Principles and Options for Vehicle-Grid Integration. White paper. June 30, 2020
- "Optimizing Prices for Small-Scale Distributed Generation Resources: A Review of Principles and Design Elements." *The Electricity Journal*, vol. 29, April 2016.
- "Wholesale Energy Markets: Setting the Right Framework for Price Responsive Demand." *The Electricity Journal*, vol. 25, December 2012.
- "The Role of Demand Response in the Efficiency of Electricity Wholesale Markets." *Papeles de Economía Española*, no. 134, December 2012.

- “Locational Electricity Capacity Markets: Alternatives to Restore the Missing Signals.” Co-authored with Hamish Fraser. *The Electricity Journal*, vol. 20, March 2007.
- Contributor to Book “The Line in the Sand: The Shifting Boundary between Markets and Regulation in Network Industries.” Chapter 4, Security of Supply. NERA Economic Consulting, 2007
- “Performance-Based Regulation of Electricity Transmission in the US: Goals and Necessary Reforms.” *Energy Regulation Insights*, vol. 28, 2006.
- “Responding to EPA Act 2005: Looking at Smart Meters for Electricity, Time-Based Rate Structures, and Net Metering.” Sponsored by Edison Electric Institute, May 2006.
- “Analysis of the Electricity Sector in Spain.” Utility Regulation in the EU. Privatisation International and Centre for the Study of Regulated Industries (CRI), Utility Regulation 2000 Series, vol. 1, 2000.

Presentations

- “An Economist View of Proposals on Income-Based Fixed Electricity Rates and Demand-Side Flexibility in California” Western Rutgers Conference (CRR), Monterey, CA, 2023.
- “Efficient Design of Standby Rates for Cogeneration”, presented to the Southern California Public Power Authority Working Group, April 18, 2023.
- “Improved Rate Designs for an Effective Regulatory Construct: Merits of the California NEM Reform for a Cleaner Energy Sector.” Western Rutgers Conference (CRR), Monterey, CA, 2022.
- “Compensating NWA Providers for their Value to the System.” EUCI’s annual Non-Wires Alternative (NWA) Conference, online webinar, May 18, 2022.
- “Distributed Energy Resource (DER) Rate Mechanisms.” Advanced Utility Rates Group, December 20, 2020.
- “Compensatory Framework for Storage and Microgrids for their Value as Capacity and Grid Resources.” 32nd Annual Western Conference (CRR), Monterey, CA, June 28, 2019.
- “Examining the Key Pricing Policy Elements of New York’s Reforming the Energy Vision.” 31st Annual Western Conference (CRR), Monterey, CA, June 28, 2018.
- “Estimating the Value of Distributed Energy Resources and Implications for Rates.” California Municipal Utility Rates Group (CMRG), Sacramento, May 2018.
- “Marginal Cost Methods and Efficient Rate Design,” Utility of the Future Rates Group, San Francisco, CA, April 2018.
- “Value-Based Tariff Model for Distributed Energy Resources: Principles and Framework Options.” 30th Annual Western Conference (CRR), Monterey, CA, June 28, 2017.

- “Incentive Methods for Electricity Distribution.” Rutgers University’s 29th Annual Western Conference (CRRI), Monterey, CA, June 23, 2016.
- “Renewable Microgrids: Getting the Pricing Right.” Marginal Cost Working Group (MCWG), Washington, DC, May 5, 2016.
- “Policy Options to Address Cross Subsidies from Self-Generation.” 12th Annual National Law Seminars International Conference on Electric Utility Ratemaking, Las Vegas, NV, March 14, 2016.
- “Demand Charges and their Role in Net Energy Metering.” Residential Demand Charges Symposium, EUCI, Calgary, Canada, December 1, 2015.
- “Utility Regulation in the Era of Distributed Renewables: Is There a Need for a New Business Model?” Rutgers University’s 28th Annual Western Conference (CRRI), Monterey, CA, June 26, 2015.
- “Solar Distributed Generation and Rate Restructuring.” California Municipal Rates Group (CMRG), Sacramento, CA, May 18, 2015.
- “Integrating Renewable Resources through Capacity Markets: The Case of California.” Law Seminars International’s Energy in California, San Francisco, CA, Sep 16, 2014.
- “Capacity Markets Put to the Test: New Approaches to Meet Evolving Reliability Needs.” Rutgers University’s 27th Annual Western Conference (CRRI), Monterey, CA, June 26, 2014.
- “Rate Design Options to Deal with Solar Net Metering Concerns.” California Municipal Rates Group (CMRG), Sacramento, CA, April 25, 2014.
- “Connecting Wholesale and Retail Pricing: A Look at Required Policy and Market Design Decisions.” Harvard Electricity Policy Group, Dana Point, CA, March 7, 2013.
- “Demand Response and its Role within Wholesale Energy and Capacity Markets.” Rutgers University’s 25th Annual Western Conference (CRRI), Monterey, CA, June 2012.
- “Achieving Efficient Demand Response through Dynamic Rates.” Law Seminars International’s Electric Ratemaking Conference, Las Vegas, NV, February 9, 2009.
- “Critical Peak Pricing: A Marginal Cost Approach.” Marginal Cost Working Group (MCWG), Phoenix, AZ, April 2008.
- “Electricity Rate Structure Design: “Rate Design and Cost Studies.” University of PURC’s World Bank International Training Program on Utility Regulation, Florida, January 16, 2007.
- “Demand Bidding Programs in ISO/RTO Environments.” Marginal Cost Working Group (MCWG), Austin, TX, October 12, 2006.
- “Locational Generation Capacity Payments in New England.” Marginal Cost Working Group (MCWG), Albuquerque, NM, April 27, 2005.

Charles River Associates

- “Analysis of the International Experience with Performance Based Regulation.”
Marginal Cost Working Group (MCWG), Nevada, April 3-5, 2000.

Professional history

2023 – Present	<i>Principal</i> , Charles River Associates, CA
2022–2023	<i>Associate Partner</i> , PA Consulting, CA
2020–2022	<i>Senior Director</i> , Energy and Environmental Economics, CA
2018–2020	<i>Senior Vice President</i> , Economists Incorporated, CA
2000–2017	<i>Vice President</i> , NERA Economic Consulting, CA
1996–1999	<i>Senior Consultant</i> , NERA Economic Consulting, Madrid, Spain

Education

Master’s Degree in Economics and Public Policy (Honors)

Fiscal Studies Institute of Madrid, Spain

Advanced microeconomics, econometrics, public policy, optimal fiscal theory, advanced mathematics.

B.A., Economics

University of Carlos III, Madrid, Spain

Concentrations: microeconomics, macroeconomics, competition policy, industrial economics, international economics, financial analysis, econometrics, mathematics.