



Ontario  
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**BY EMAIL**

March 6, 2026

Ritchie Murray  
Acting Registrar  
Ontario Energy Board  
2300 Yonge Street, 27th Floor  
Toronto, ON M4P 1E4

Dear Mr. Murray:

**Re: Ontario Power Generation Inc. (OPG) and DNNP LP (the Applicants)  
2027-2031 Payment Amounts Application - Proposed OEB Staff Evidence  
OEB File Number: EB-2025-0297**

In Procedural Order No. 2, the Ontario Energy Board (OEB) directed OEB staff to elaborate on the evidence it proposes to file in this proceeding. This letter responds to that direction. OEB staff has retained Christensen Associates Energy Consulting, LLC (CAEC) and Pacific Economics Group Research, LLC (PEG) to assist OEB staff in reviewing evidence supporting certain approvals sought by the Applicants in the following areas:

- OPG's and DNNP LP's proposed capital structure
- The proposed nuclear Custom Incentive Rate-setting (CIR) framework to set blended nuclear payment amounts, including the underlying benchmarking evidence
- The proposed CIR framework to set hydroelectric payment amounts, including the factors to index the 2028-2031 payment amounts and the underlying benchmarking and productivity evidence

Proposed Evidence to be filed by Christensen Associates Energy Consulting, LLC

OEB staff has retained CAEC to prepare two expert reports:

1. An expert report assessing the recommendations in the "Common Equity Ratio Study" prepared by Concentric Energy Advisors Inc.<sup>1</sup> This includes Concentric's

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<sup>1</sup> Exhibit C-1-1, Attachment 1

recommendation to set OPG's payment amounts for the term based on a deemed equity ratio of no less than 52%. The report will explain whether CAEC agrees with Concentric's recommended equity ratio for OPG, and if not, it will include an alternative recommendation. This work will be led by Mr. Nick Crowley, who will be assisted by other members of CAEC's staff team. CAEC has provided expert evidence on cost of capital issues in several jurisdictions, including the US Southeast and Michigan. Mr. Crowley's CV is attached.

2. A review of the Nuclear Cost Performance Benchmarking report prepared by ScottMadden Management Consultants.<sup>2</sup> This report will also present CAEC's views of the proposed five forecasted revenue requirements through the Applicants' proposed incentive rate-setting framework, including their proposed stretch factor. CAEC has performed similar work on incentive rate setting frameworks in Massachusetts, Alberta, British Columbia, and for the OEB. This work will be led by Dr. Sherry Wang, who will be assisted by other members of CAEC's staff team. Dr. Wang's CV is attached.

In addition, CAEC will prepare an empirical research paper summarizing its observations on the question of whether electricity generators or other companies have historically been able to raise money through investment grade bonds when embarking on ventures relying on a First of a Kind (FOAK) technology.

The context for this research is the Applicants' request for DNNP LP payment amounts to be set based on a 100% equity funded capital structure, which is supported by an expert report by Polar Star Advisory called "Initial Financing for Darlington New Nuclear Program".<sup>3</sup> Polar Star concludes that "there is a low to very low probability of a successful offering of investment grade non-recourse bonds within 12-18 months following the in-service date of the first SMR unit for the DNNP" (expected for October 2030), and that "potential bond investors will view FOAK nuclear technology risk as the biggest unknown and unquantifiable risk".

CAEC is not being asked to provide an opinion on the proposed equity structure for DNNP LP or on any of the matters on which Polar Star opined; rather, the purpose is to provide purely factual information about historical bond offerings, with a view to providing some factual context for this aspect of the application.

#### Proposed Evidence to be filed by Pacific Economics Group Research, LLC

OEB staff has retained PEG to provide two written expert reports relating to the hydroelectric Custom Price Cap proposal:

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<sup>2</sup> Exhibit F2-1-1, Attachment 4

<sup>3</sup> Exhibit C-1-1, Attachment 3

1. A review of the evidence prepared by London Economics International LLC (LEI).<sup>4</sup> PEG will also provide its views on the appropriateness of LEI's recommended 0.15% stretch factor. If PEG does not agree that a 0.15% stretch factor is appropriate, PEG will provide alternative recommendations, which could be based on its own study.
2. An explanation of PEG's views regarding various aspects of OPG's proposed hydroelectric annual adjustment mechanism. This will include the Capital and Gross Revenue Charge factors. PEG will provide its views with consideration for OEB expectations expressed in prior decisions and the principles of performance-based ratemaking. If PEG does not agree with the proposed mechanism, PEG may propose an alternative.

PEG's work will be led by Dr. Mark Newton Lowry, who will be assisted by other members of PEG's staff team. PEG has provided evidence of a similar nature in several OEB proceedings including Toronto Hydro-Electric System Limited EB-2023-0195, Enbridge Gas Phase 1 EB-2022-0200, and Ontario Power Generation Inc. EB-2016-0152, and in numerous other jurisdictions in the U.S. and Canada. Dr. Lowry's CV is attached.

Additional Consultant Support (Not to be Filed as Evidence)

OEB staff would also like to inform the OEB and the parties to this proceeding that OEB staff has retained Acumen Engineered Solutions International Inc. (Acumen) as a consultant to assist OEB staff in examining OPG's hydroelectric project plans as presented in Exhibit D1 and Exhibit F1. Acumen will not be filing evidence in this proceeding.

Yours truly,

Thomas Eminowicz  
Senior Advisor,  
Generation & Transmission

Jeffrey Sauer  
Senior Advisor,  
Generation & Transmission

Attachments: CVs for Mr. Crowley, Dr. Wang and Dr. Lowry  
Cc: All parties in EB-2025-0297

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<sup>4</sup> Exhibit A1-3-2, Attachments 1, 2, and 3

# Xueting (Sherry) Wang

## RESUME

January 2026

### Address:

Laurits R. Christensen Associates, Inc.  
800 University Bay Drive, Suite 400  
Madison, WI 53705-2299  
Telephone: 608.216.7110  
Email: swang@caenergy.com

### Academic Background:

Doctor of Philosophy – Columbia University, 2021, Sustainable Development  
Master of Public Policy – National University of Singapore, 2014, Public Policy  
Bachelor of Science – National University of Singapore, 2011, Chemistry & Political Science

### Positions Held:

Economist, Laurits R. Christensen Associates, Inc., Sep 2021-present  
Research Assistant, Columbia University, 2018-2021  
Teaching Assistant, Columbia University, 2015-2019  
Research Assistant, National University of Singapore, 2013-2014

### Professional Experience:

I have training in applied econometrics, economic model development and analysis of large datasets. I have applied these skills to support regulators in the design and evaluation of incentive regulation frameworks, and to assist utilities with analyzing demand response load impacts, load forecasting, rate design model development, and bill impact analysis. In my doctoral research, I have developed and estimated a model of consumer product choice in retail electricity markets using a large consumer-level dataset; estimated the competitive effect of wind power using firm-level energy offer curves; estimated the effect of transmission expansion on electricity market dispatch using wholesale market transmission limit and price data. I have used Stata, R, MATLAB, Python, Excel, ENVI, and ArcGIS for economic and statistical analysis. I am a referee for the *Energy Journal*. I have also provided economic analysis for class action lawsuits.

### Major Projects

Designed a framework for indexed incentive regulation.

Prepared an expert report on a utility rate case.

Prepared a report on performance-based regulation.

Estimated load impacts for an automated response technology program.

Estimated heat hump electricity and gas usage for a utility.

Produced long-term EV load forecast for a utility.

Prepared a memorandum evaluating alternative rate designs.

Prepared a report on utility remuneration and performance incentive mechanisms.

Prepared a memorandum reviewing the methodology of embedded cost of service study.

Supported density rate design by a natural gas utility.

Developed a rate design model for a municipal utility.

Prepared a memorandum describing the merger of two rate classes.

Prepared a memorandum discussing performance incentive mechanisms.

Calculated cost allocators for a utility rate case application.

Produced long-term load forecast for a utility rate case application.

Calculated customer bill impacts for a utility rate case application.

Estimated load impacts for a residential air conditioning load control program.

Estimated load impacts for a non-residential critical peak pricing program.

Evaluated pricing for a voluntary retail service option.

Calculated electricity rates under an alternative rate design for an electric utility.

Provided economic analysis in antitrust class action of price-fixing.

Provided economic analysis in antitrust class action of no-hire agreement.

**Professional Papers and Reports**

“Proposed Approach to the Indexed Regulation of Maine’s Electricity Distribution Utilities,” with Nick Crowley, et al., January 20, 2026.

“Evaluation of Hydro Ottawa’s Proposed Custom Incentive Regulation Framework”, for the Ontario Energy Board, with Mr. Nicholas Crolwey and Daniel McLeod, October 14, 2025.

“Performance-Based Regulation Report,” for the Maine Public Utility Commission, with Mr. Nicholas Crowley, et al., April 29, 2025.

“2024 Load Impact Evaluation for Pacific Gas & Electric Company’s Automated Response Technology Program” with Michael Vigdor, Corey Goodrich, and Michael Ty Clark, 2025.

“2024 Load Impact Evaluation for Pacific Gas & Electric Company’s SmartAC™ Program” with Van Ngo and Andi Romanovs-Malovrh, 2025.

“Jurisdictional Review of Utility Remuneration Models for the Ontario Energy Board” with Nicholas A. Crowley and Andi Romanovs-Malovrh, 2024.

“2023 Statewide Load Impact Evaluation of Non-Residential Critical Peak Pricing (CPP) Rates” with Michael Ty Clark, Daniel McLeod, Daniel G. Hansen, 2023.

“2023 Load Impact Evaluation for Pacific Gas & Electric Company’s SmartAC™ Program” with Corey Lott and Andi Romanovs-Malovrh, 2023.

“2022 Statewide Load Impact Evaluation of Non-Residential Critical Peak Pricing (CPP) Rates” with Daniel G. Hansen, Michael Ty Clark, and Corey Lott, 2023.

“2022 Load Impact Evaluation for Pacific Gas & Electric Company’s SmartAC™ Program” with Corey Lott, 2023.

“2021 Statewide Load Impact Evaluation of Non-Residential Critical Peak Pricing (CPP) Rates” with Daniel G. Hansen, Michael Ty Clark, Corey Lott, and Michael Vigdor, 2022.

“2021 Load Impact Evaluation for Pacific Gas & Electric Company’s SmartAC™ Program” with Corey Lott, 2022.

**Conference Presentations**

“Large-Customer Rate Designs”, EUCI’s Advanced Rates Course, December 9, 2025.

“Canadian Large-Customer Rate Designs and Rate Design Criteria for Data Centers.” EUCI’s Canadian Innovative Retail Electricity Pricing Conference (Virtual). October 2025.

“Introduction to Alternative Regulation.” Edison Electric Institute. Hosted at the University of Wisconsin-Madison. July 2025.

“Load Impact Evaluation: *Automated Response Technology program.*” DRMEC Load Impact Evaluation and Enrollment Workshop (Virtual) May 2025.

“Cost Allocation and Electricity Rate Design for Data Centers.” EUCI’s Data Center Project Development, Utilities & Load Growth, Denver, CO, March 2025.

“Load Impact Evaluation: *SmartAC program.*” DRMEC Load Impact Evaluation and Enrollment

Workshop (Virtual) May 2023.

"Load Impact Evaluation: *SmartAC program*." DRMEC Load Impact Evaluation and Enrollment Workshop (Virtual) May 2022.

"Are Long Term Fixed Rate Contracts Valuable to Consumers? Evidence from Retail Electricity Market." Asian Pacific Industrial Organization Conference. Tokyo, Japan. December 2019.

"How Much Value has Retail Electricity Choice Created?" Heartland Environmental and Resource Economics Workshop. Illinois. September 2019.

"Switching Cost and Deregulation in Retail Electricity Market." 2019 Georgetown Center for Economic Research Biennial Conference. Washington, DC. May 2019.

"The Effect of Transmission Limit on Market Outcome." Empirics and Methods in Economics Conference. Chicago, IL. October 2017.

"Performance Management in the Office of Energy Efficiency and Renewable Energy." American Society for Public Administration Conference. Washington, DC. March 2014

### **Working Papers**

"The Price Effect of Large-Scale Wind Energy."

"Long Term Contracts in Retail Electricity."

"The Effect of Transmission Limit on Market Outcome: Evidence from ERCOT."

**Computer/Programming Skills:** Deep knowledge of R, MATLAB, and STATA for data analysis; some experience with Python, Excel, ENVI, and ArcGIS.

# Nick Crowley

## RESUME

January 2026

### **Business Address:**

Laurits R. Christensen Associates, Inc.  
800 University Bay Drive, Suite 400  
Madison, WI 53705-2299  
Telephone: 608.216.7170  
Email: [nacrowley@caenergy.com](mailto:nacrowley@caenergy.com)  
LinkedIn: <https://www.linkedin.com/in/nicholasacrowley/>

### **Academic Background:**

Master of Science – University of Wisconsin-Madison, 2014, Economics  
Bachelor of Arts – University of Wisconsin-Madison, 2012, Economics  
Chartered Financial Analyst - Charter Awarded in October 2024  
Certified Rate of Return Analyst – Awarded June 2025

### **Positions Held:**

Vice President, Laurits R. Christensen Associates, Inc., Jan. 1, 2024-present  
Senior Economist, Laurits R. Christensen Associates, Inc., Sept. 1, 2021-Dec. 2023  
Economist, Laurits R. Christensen Associates, Inc., 2019-Aug. 31, 2021  
Staff Economist, Laurits R. Christensen Associates, Inc., 2016-2018  
Economist, Federal Energy Regulatory Commission, 2015-2016

### **Professional Experience:**

I am an expert witness on issues in network economics, with an emphasis on corporate finance, cost allocation, rate design, and productivity measurement. In my time as a consultant, I have testified on behalf of major public utilities in rate proceedings, measured cost of capital and assembled corresponding reports, developed alternative rate designs, and forecasted electricity load for supply planning purposes. I have also performed extensive research for benchmarking purposes using publicly available data. My work includes marginal cost estimation and the development of marginal cost models for major electric utilities. My reports have been filed before regulatory authorities across North America. Prior to joining Christensen Associates Energy Consulting, I served as an Economist at the Federal Energy Regulatory Commission, where I assisted with energy industry benchmarking, market power studies, and the review and evaluation of natural gas pipeline rate cases. I have extensive facility with Stata and Excel, in addition to other software packages used in quantitative analysis.

**PUBLIC TESTIMONY**

“Pre-filed Joint Direct Testimony of Nicholas Crowley, CFA and Daniel McLeod, PhD,” Massachusetts D.P.U. 26-50, January 16, 2026.

“Direct Testimony of Nicholas A. Crowley,” Public Utilities Commission of Ohio, Case No. 25-0958-EL-AIR, November 10, 2025.

“Direct Testimony of Nicholas A. Crowley and Daniel McLeod, PhD,” New Hampshire Department of Energy, Docket DE 24-070, January 24, 2025.

“Pre-filed Direct Testimony of Nicholas A. Crowley,” Florida Public Utilities Commission, Docket No. 20240099-EI, August 22, 2024.

“Rebuttal Testimony of Mark E. Meitzen and Nicholas A. Crowley,” Massachusetts D.P.U., D.P.U. 23-150, April 26, 2024.

“Direct Testimony of Nicholas A. Crowley,” Nicholas A. Crowley, MS, New Hampshire Department of Energy, Docket DE 23-039, December 13, 2023.

“Direct Testimony of Nicholas A. Crowley,” Nicholas A. Crowley, MS, Michigan Public Service Commission, Case No. U-21488, December 11, 2023.

“Direct Testimony of Mark E. Meitzen and Nicholas A. Crowley,” Nicholas A. Crowley, MS, Massachusetts D.P.U., D.P.U. 23-150, August 17, 2023.

“Direct Testimony of Nicholas A. Crowley,” Nicholas A. Crowley, MS, Massachusetts D.P.U., D.P.U. 23-80 AND D.P.U. 23-81, August 17, 2023.

“Rebuttal Evidence,” Mark E. Meitzen, Ph.D. and Nicholas A. Crowley, MS, Alberta Utilities Commission, Proceeding 27388, April 28, 2023.

“Determination of the Third-Generation X Factor for the AUC Price Cap Plan,” Mark E. Meitzen, Ph.D. and Nicholas A. Crowley, MS, Alberta Utilities Commission Proceeding 27388, January 20, 2023.

“Rebuttal Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS,” Massachusetts D.P.U. 22-22, June 10, 2022.

“Direct Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS,” Massachusetts D.P.U. 22-22, January 14, 2022.

“Rebuttal Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS,” Massachusetts D.P.U. 20-120, April 23, 2021.

“Direct Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS,” Massachusetts D.P.U. 20-120, November 13, 2020.

“Rebuttal Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS,” Massachusetts D.P.U. 22-22, June 10, 2022.

“Direct Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS,” Massachusetts D.P.U. 22-22, January 14, 2022.

"Rebuttal Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS," Massachusetts D.P.U. 20-120, April 23, 2021.

"Direct Testimony of Mark E. Meitzen Ph.D. and Nicholas A. Crowley, MS," Massachusetts D.P.U. 20-120, November 13, 2020.

## **REPORTS AND WORKING PAPERS**

"Reply Report: FERC Oil Price Index," with Dan McLeod, PhD and Corey Goodrich, Federal Energy Regulatory Commission, RM26-06, January 20, 2026.

"Proposed Approach to the Indexed Regulation of Maine's Electricity Distribution Utilities," with Daniel McLeod, Sherry Wang, and Van Ngo, Maine Public Utilities Commission Docket 2025-00354, January 20, 2026.

"Evaluation of FERC Oil Price Index," with Dan McLeod, PhD and Corey Goodrich, Federal Energy Regulatory Commission, RM26-06, December 24, 2025.

"Evaluation of Hydro Ottawa's Proposed Custom Incentive Regulation Framework," with Dr. Daniel McLeod and Dr. Sherry Wang, Ontario Energy Board, Docket EB-2024-0115, October 14, 2025.

"Reopener Proceeding for ATCO Utilities: Rebuttal Report," with Dr. Daniel McLeod, Alberta Utilities Commission, Proceeding 29064, February 12, 2025

"Evaluation of Reopener Remedy Options," with Dr. Daniel McLeod, Alberta Utilities Commission, Proceeding 29064, November 29, 2024.

"Making Sense of Multi-Year Rate Plans," with Dr. Daniel McLeod, Technical Brief, October 2024.

"Jurisdictional Review of Utility Remuneration Models," with Xueting (Sherry) Wang, and Andi Romanovs-Malovrh, Ontario Energy Board, September 2024.

"Cost of Capital Study," for Grand Bahama Power Company, Ltd. August 15, 2024.

"BC Hydro Performance-Based Regulation Framework," for the British Columbia Hydro and Power Authority." With Dr. Daniel McLeod and Dr. Mark Meitzen. December 21, 2023.

"2022 Load Impact Evaluation of San Diego Gas and Electric's Voluntary Residential Critical Peak Pricing (CPP) and Time-of-Use (TOU) Rates." (with Michael Ty Clark and Aidan Glaser-Schoff)

"2021 Load Impact Evaluation of San Diego Gas and Electric's Voluntary Residential Critical Peak Pricing (CPP) and Time-of-Use (TOU) Rates." (with Michael Ty Clark and Aidan Glaser-Schoff)

"Long Term Avoided Costs, for assessment of Resource Options Including Conservation Programs and LED Lighting." For Florida Public Utilities Company. 2021.

"Cost of Capital Study," For Grand Bahama Power Company, Ltd. April 15, 2021.

"2020 Load Impact Evaluation of San Diego Gas and Electric's Voluntary Residential Critical Peak Pricing (CPP) and Time-of-Use (TOU) Rates." (with Michael Ty Clark and Navya Kataria)

"Cost of Capital Study," St. Croix Valley Natural Gas Company, Inc. June 20, 2019.

"2019 Load Impact Evaluation of San Diego Gas and Electric's Voluntary Residential Critical Peak Pricing (CPP) and Time-of-Use (TOU) Rates." (with Michael Ty Clark)

"Methodology and Cost Estimates for Generation and Transmission Services, 2021-2029." For Newfoundland and Labrador Hydro. November 15, 2018.

"Cost of Capital Study," Grand Bahama Power Company, Ltd. October 17, 2018.

"2018 Load Impact Evaluation of San Diego Gas and Electric's Voluntary Residential Critical Peak Pricing (CPP) and Time-of-Use (TOU) Rates." (with Michael Ty Clark)

"2017 Load Impact Evaluation of California Statewide Base Interruptible Programs (BIP) for Non-Residential Customers: Ex-post and Ex-ante Report." (with Michael Ty Clark and Dan Hansen)

"2017 Load Impact Evaluation of San Diego Gas and Electric's Voluntary Residential Critical Peak Pricing (CPP) and Time-of-Use (TOU) Rates." (with Michael Ty Clark and Dan Hansen)

"2016 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-Based Pricing Programs: Ex-post and Ex-ante Report for Customers with Net Energy Metering." (with Michael Ty Clark and Dan Hansen)

"2016 Load Impact Evaluation of Pacific Gas and Electric Company's Mandatory Time-of-Use Rates for Small, Medium, and Agricultural Non-residential Customers: Ex-post and Ex-ante Report." (with Michael Ty Clark and Dan Hansen)

"Common Metrics Report: Performance Metrics for Regional Transmission Organizations, Independent System Operators, and Individual Utilities for the 2010-2014 Reporting Period." *Federal Energy Regulatory Commission Staff Report*, 2016.

## **CONFERENCE PRESENTATIONS**

"Designing Incentives for Utility Performance," EUCI's Advanced Rates Course, December 9, 2025.

"Costing and Pricing to Support Rate Innovation." EUCI's Canadian Innovative Retail Electricity Pricing Conference. Vancouver, British Columbia. October 21, 2025.

"Rate Design for Revenue Adequacy and Price Efficiency." With Bruce Chapman. Wisconsin Public Utility Institute. *Energy Utility Basics*. (Dates: 2025, 2024, 2023, 2022, 2021)

"Introduction to Alternative Regulation." Edison Electric Institute. Hosted at the University of Wisconsin-Madison. July 2025.

"Costing and Pricing to Support Rate Innovation." Edison Electric Institute. Hosted at the University of Wisconsin-Madison. July 2025.

"Marginal Cost Analysis of Electricity Services for Utilities." With Michael Clark and Michael Vigdor. EUCI Workshop. May 28, 2024.

"Dynamic, Tailored, and Niche Rate Design." With Bruce Chapman. Wisconsin Public Utility Institute. *Energy Utility Basics*. October 8, 2024.

"Introduction to Alternative Regulation." Edison Electric Institute. Hosted at the University of Wisconsin-Madison. July 2024.

"Avoided Costs of Electricity Services." With Michael Clark and Michael Vigdor. EUCI Workshop. March 19, 2024.

"Essentials of Costing: Embedded and Marginal Cost." With Bruce Chapman. Wisconsin Public Utility Institute. *Energy Utility Basics*. October 10, 2023.

"Marginal Costs of Electricity Services." Edison Electric Institute. Hosted at the University of Wisconsin-Madison. July 2023.

"Introduction to Performance-Based Regulation." EUCI Workshop. Virtual. May 2023.

"Introduction to Retail Electricity Regulation for FERC Staff." Federal Energy Regulatory Commission, Office of Energy Market Regulation Training Council. Virtual. February 2023.

"Marginal Costs of Electricity Services." EUCI Workshop. Virtual. February 2023.

"Rate Innovation for Cooperatives and Public Power." EUCI Workshop. Virtual. March 2022.

"Marginal Costs of Electricity Services." EUCI Workshop. Virtual. March 2022.

"Ratemaking Under Performance-Based Regulation." EUCI Workshop. Virtual. February 2022.

"Ratemaking Under Performance-Based Regulation." EUCI Workshop. Virtual. November 2021.

"Rate Design and the Potential Impacts of Covid-19." EUCI Workshop. Virtual. November 17, 2020.

"Ratemaking Under Performance-Based Regulation." EUCI Workshop. Atlanta, Georgia. March 9, 2020.

"Load Impact Evaluation: *Base Interruptible Program*." DRMEC Spring Workshop, California Public Utilities Commission. April 26, 2019.

"FERC Regulatory Policy and Relevant Environmental Issues, Focusing on the United States Natural Gas Grid," 2015 Energy Hub Conference. Hosted at the University of Wisconsin-Madison.

**ACADEMIC PUBLICATIONS**

"Trends and Drivers of Distribution Utility Costs in the United States: A Descriptive Analysis from 2008 to 2022." *Electricity Journal*. 37 (2024) 107397.

"Measuring the Price Impact of Price-Cap Regulation Among Canadian Electricity Distribution Utilities." *Utilities Policy*. Vol. 72, October 2021. (with Dr. Mark Meitzen)

# MARK NEWTON LOWRY, PH.D.

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## **PACIFIC ECONOMICS GROUP RESEARCH, LLC**

mnlowry@pacificeconomicsgroup.com  
44 E. Mifflin St., Suite 601, Madison, WI 53703  
(608) 257-1522 Ext. 23

## **Education**

Ph.D.: Applied Economics, University of Wisconsin-Madison  
BA: Ibero-American Studies, University of Wisconsin-Madison  
High School: Hawken School, Gates Mills, Ohio

## **Relevant Work Experience, Primary Positions**

**Present Position**            **President, Pacific Economics Group Research, LLC, Madison, WI**

Chief executive and sole proprietor of a consulting firm in the field of utility economics. Leads internationally recognized practice performance-based regulation and utility performance research. Other research specialties include: utility industry restructuring, codes of competitive conduct, markets for oil and gas, and commodity storage. Duties include project management and expert witness testimony.

**October 1998-February 2009**    **Partner, Pacific Economics Group, Madison, WI**

Managed PEG's Madison office. Developed internationally recognized practice in the field of statistical cost research for energy utility benchmarking and Altreg. Principal investigator and expert witness on numerous projects.

**January 1993-October 1998**    **Vice President**

**January 1989-December 1992**    **Senior Economist, Christensen Associates, Madison, WI**

Directed the company's Regulatory Strategy group. Participated in all Christensen Associates testimony on energy utility Altreg and benchmarking.

**Aug. 1984-Dec. 1988**            **Assistant Professor, Department of Mineral Economics, The Pennsylvania State University, University Park, PA**

Responsibilities included research and graduate and undergraduate teaching and advising. Courses taught: Min Ec 387 (Introduction to Mineral Economics); 390 (Mineral Market Modeling); 484 (Political Economy of Energy and the Environment) and 506 (Applied Econometrics). Research specialty: role of storage in commodity markets.

**August 1983-July 1984**            **Instructor, Department of Mineral Economics, The Pennsylvania State University, University Park, PA**

Taught courses in Mineral Economics (noted above) while completing Ph.D. thesis.

**April 1982-August 1983**            **Research Assistant to Dr. Peter Helmberger, Department of Agricultural and Resource Economics, University of Wisconsin-Madison**

Dissertation research on the role of speculative storage in markets for field crops. Work included the development of a quarterly econometric model of the U.S. soybean market.

**March 1981-March 1982                      Natural Gas Industry Analyst, Madison Consulting Group, Madison, Wisconsin**

Research under Dr. Charles Cicchetti in two areas:

- Impact of the Natural Gas Policy Act on the production and average wellhead price of natural gas in the United States. An original model was developed for forecasting these variables through 1985.
- Research supporting litigation testimony in an antitrust suit involving natural gas producers and pipelines in the San Juan Basin of New Mexico.

**Relevant Work Experience, Visiting Positions:**

**May-August 1985                              Professeur Visiteur, Centre for International Business Studies, Ecole des Hautes Etudes Commerciales, Montréal, Québec.**

Research on the behavior of inventories in metal markets.

**Major Consulting Projects**

1. Research and Testimony on Power Distributor Cost Benchmarking and IR Plan Design, Ontario Energy Board, ongoing.
2. PBR Plan Design Research for a Vertically-Integrated US Electric Utility, Client Name Withheld, ongoing.
3. Presentation on Alternative Regulation and PBR for a State Regulator, Lawrence Berkeley National Laboratory, 2025.
4. Research and Testimony on Input Price Forecasts for a Rate Case and Multiyear Rate Plan for a Vertically-Integrated US Electric Utility and a US Gas Utility, Client Name Withheld, ongoing.
5. Research and Report on Power Distributor Spending Patterns during Multiyear Rate Plans and Capitalization Policy Changes for the Ontario Energy Board, ongoing.
6. Research and Report on Power Distributor Productivity Trends, Cost Benchmarking, and Transnational Cost Benchmarking for the Ontario Energy Board, ongoing.
7. Research and Report on Performance-based Ratemaking for Vertically-Integrated Electric Utilities, Clean Virginia, 2024.
8. Consultation on Performance-based Ratemaking for Power Distributors, Avangrid, 2024.
9. Research and Testimony on Gas Utility Cost Benchmarking and Productivity Trends, Ontario Energy Board, 2023-2024.
10. Research and Testimony on Power Distributor Cost Benchmarking, Productivity Trends, and IR Plan Design, Ontario Energy Board, 2024.
11. Research and Testimony on Input Price Forecasts for a Rate Case and Multiyear Rate Plan, Puget Sound Energy, 2023-2024.
12. Survey of Gas and Electric Alternative Regulation Precedents, Edison Electric Institute, published February 2024.
13. Research on the Design of Targeted Performance Incentive Mechanisms for a Vertically-Integrated US Electric Utility, Duke Energy, 2023.

14. PBR Plan Design, Power Distributor Productivity, and Power and Gas Distributor Benchmarking Research and Testimony for an Alberta Intervenor, Consumers' Coalition of Alberta, 2022-2023.
15. Consultation on Multiyear Rate Plans for a Vertically-Integrated US Electric Utility, Public Service of New Mexico, 2022.
16. Assistance with a White Paper on PBR. National Conference of State Legislatures, 2022.
17. Research and Testimony on Targeted Performance Incentive Mechanisms for a Vertically-Integrated US Electric Utility and Gas Distributor, Puget Sound Energy, 2021-2022.
18. Research on Operation and Maintenance Revenue Escalators and Input Price Inflation Adjustment Mechanism Research for a Vertically-Integrated US Electric Utility and Gas Distributor, Puget Sound Energy, 2021-2022.
19. Testimony on Multiyear Rate Plan Ratemaking Rules for a Vertically-Integrated Electric Utility, Duke Energy, 2021-2022.
20. Research and Testimony on Power Transmission and Distribution Productivity, Benchmarking, and PBR Plan Design, Ontario Energy Board, 2021-2022.
21. Benchmarking of Granular Power Distributor Costs for a Canadian Regulator, Ontario Energy Board, 2018-2021.
22. Consultation and Report on Performance-Based Ratemaking for a Vertically-Integrated Electric Utility, Public Service of New Mexico, 2021-2022.
23. Research and Testimony on Power Transmission Productivity and Cost Benchmarking, Association Québécoise des Consommateurs Industriels d'Electricité, 2020-2021.
24. White Paper and Workshop on PBR for a Vertically-Integrated Electric Utility, British Columbia Utilities Commission 2020-2021.
25. Research and Testimony on Productivity and PBR Plan Design for a Vertically-Integrated Electric Utility, Hawaiian Electric, 2018-2020.
26. Research and Testimony on Power Distributor Cost Benchmarking and PBR Plan Design, Ontario Energy Board, 2020.
27. Research and Testimony on Gas Distributor Productivity, Cost Benchmarking, and PBR Plan Design, Massachusetts Attorney General's Office, 2020.
28. Research and Testimony on Power Transmitter Productivity, Cost Benchmarking, and PBR Plan Design, Ontario Energy Board, 2019.
29. Research and Testimony on Power Transmitter Productivity, Cost Benchmarking, and PBR Plan Design, Ontario Energy Board, 2018-2019.
30. Testimony on PBR for Power Transmission and Distribution Utilities, Association Québécoise des Consommateurs Industriels d'Electricité, 2017-2019.
31. Research and Testimony on Power Distributor Productivity, Massachusetts Attorney General's Office, 2019.
32. Research and Testimony on Power Distributor Cost Benchmarking and PBR Plan Design for a Canadian Regulator, Ontario Energy Board, 2018-2019.
33. Briefing on Trends in Alternative Regulation, Duke Energy, 2018.
34. Testimony on PBR for a Vertically-Integrated Electric Utility, Northern States Power (MN), 2017.
35. Research and Testimony on Gas Utility Productivity for a Canadian Regulator, Ontario Energy Board, 2017-2018.
36. Research and Testimony on Power Distributor Productivity, Cost Performance and PBR Plan Design for a Canadian Regulator, Ontario Energy Board, 2017-2018.

37. White Paper on Multiyear Rate Plans and U.S. Power Distributor Productivity Trends, Lawrence Berkeley National Laboratory, 2017.
38. Benchmarking Study and Atrég Consultation for a Northeastern Power Distributor, Green Mountain Power, 2017.
39. Statistical Benchmarking and Multiyear Rate Plan Research and Testimony for a Western Electric Utility, Public Service of Colorado, 2017-2018.
40. Presentation on PBR and Distribution System Planning for a U.S. Government Workshop, Lawrence Berkeley National Laboratory, 2017.
41. Transnational Benchmarking of Power Distribution Cost, Productivity and Rates for a Canadian Consumer Group, Alberta Utilities Consumer Advocate, 2017-2018.
42. Statistical Benchmarking and Multiyear Rate Plan Research and Testimony for a Western Gas Utility, Public Service of Colorado, 2017.
43. Consultation on Atrég Trends for a Vertically Electric Integrated Utility, Duke Energy, 2016.
44. Workshop on PBR for Regulators in Vermont, Lawrence Berkeley National Laboratory, 2016.
45. Research and Testimony on Hydroelectric Generation and Multiyear Rate Plan for a Canadian Regulator, Ontario Energy Board, 2016.
46. Development of a Revenue Decoupling Mechanism and Supporting Testimony for a Midwestern U.S. Environmental Advocate, Fresh Energy, 2016.
47. Research and Testimony on Multiyear Rate Plan Design and U.S. Power Distribution Productivity Trends, Consumers' Coalition of Alberta, 2016.
48. Testimony on Revenue Decoupling for Pennsylvania Energy Distributors, National Resources Defense Council, March 2016.
49. White Paper on Performance Metrics for the Utility of the Future, Edison Electric Institute and a consortium of U.S. electric utilities, 2016.
50. White Paper on PBR for Electric Utilities in a High Distributed Energy Resources Future, Lawrence Berkeley National Laboratory, January 2016.
51. White Paper on Multiyear Rate Plans for U.S. Electric Utilities, Edison Electric Institute and a consortium of U.S. electric utilities, 2015.
52. Survey of Gas and Electric Alternative Regulation Precedents, Edison Electric Institute, 2015.
53. Research and Development of Regulatory Frameworks for the Utility of the Future, Powering Tomorrow, 2015.
54. White Paper on PBR for a Vertically-Integrated Electric Utility, Xcel Energy, 2015.
55. Research and Testimony on Merger of Two Energy Utility Holding Companies, Great Lakes Utilities, 2014-2015.
56. Assessment of Statistical Benchmarking for Three Australian Power Distributors, Networks New South Wales, 2014-2015.
57. Research and Testimony on Statistical Benchmarking and O&M Cost Escalation for an Ontario Power Distributor, Oshawa PUC Networks, 2014-2015.
58. Transnational Benchmarking of Power Distributor O&M Expenses, Australian Energy Regulator, 2014.
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60. Research and Testimony on Productivity Trends of Vertically Integrated Electric Utilities, Client Name Withheld, 2014.
61. Research and Testimony on Productivity Trends of Gas and Electric Power Distributors for a Canadian Consumer Group, Commercial Energy Consumers of BC, 2013-2014.

62. Research on the Design of Multiyear Rate Plans for a Southeast Electric Utility, (client name withheld). 2013-2014.
63. Research on the Design of Multiyear Rate Plans for a Midwest Electric & Gas Distributor, (client name withheld). 2013-2014.
64. Research on Drivers of O&M expenses for a Canadian Gas Utility, Gaz Metro. 2013.
65. Consultation on Regulatory Strategy for a California Electric and Gas Utility, San Diego Gas & Electric. 2013.
66. Research and Testimony on the Design of an Attrition Relief Mechanism for a Northeast U.S. Electric Utility, Fitchburg Gas & Electric. 2013.
67. Consultation on an Altreg Strategy for a Midwestern Electric Utility, Oklahoma Gas & Electric. 2013.
68. Consultation on an Altreg Strategy for a Southeast Electric Utility (client name withheld). 2013.
69. Research and Testimony on Issues in PBR Plan Implementation for a Canadian Consumer Group, Consumers' Coalition of Alberta. 2013.
70. Research and Testimony on the Design of an Attrition Relief Mechanism for a Northeast Electric Utility, Central Maine Power. 2013.
71. Survey of Gas and Electric Altreg Precedents. Edison Electric Institute. 2012-2013.
72. Testimony for US Coal Shippers on the Treatment of Cross Traffic in US Surface Transportation Board Stand Alone Cost Tests. 2012
73. Productivity and Plan Design Research and Testimony in Support of a PBR plan for Canadian Gas Distributor, Gaz Metro. 2012-2013.
74. Research and Testimony on Projected Attrition for a Western Electric Utility, Avista. 2011-2012.
75. Research and Testimony on Remedies for Regulatory Lag for 2 Northeastern Power Distributors, Atlantic City Electric & Delmarva Power & Light. 2011-2012.
76. Research and Testimony on the Design of a Attrition Relief Mechanisms for power and gas distributors on behalf of a Canadian Consumer Group, Consumers' Coalition of Alberta. 2011-2012.
77. Assistance with an Alternative Regulation Settlement Conference for a Northeastern Power Distributor, Delmarva Power & Light. 2011.
78. Research and Testimony on Approaches to Reduce Regulatory Lag for a Northeastern Power Distributor, Potomac Electric Power. 2011.
79. Benchmarking Research and Report on the Performance of a Midwestern Electric Utility, Oklahoma Gas & Electric, 2011.
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81. Research and Report on the Design of an Incentivized Formula Rate for a Canadian Gas Distributor. Gaz Metro Task Force. 2010-2011.
82. Research and Testimony in Support of Revenue Decoupling for a Power Distributor. Commonwealth Edison, 2010-2011.
83. Research and Testimony in Support of a Forward Test Year Rate Filing by a Western Gas Distributor. Xcel Energy, 2010.
84. Statistical Cost Benchmarking for a Midwestern Electric Utility, Oklahoma Gas & Electric, 2010.
85. White Paper on Alternative Regulation Precedents for Electric Utilities. Client Name Withheld. 2010-2011.
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87. Research and Report on the Performance of a Western Electric Utility. Portland General Electric, 2009-2010.
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89. Research and Report on PBR Designed to Incent Long Term Performance Gains. Client Name Withheld, 2009-2010.
90. Research and Testimony on PBR for Western Gas and Electric Utilities Operating under Decoupling. San Diego Gas & Electric and Southern California Gas, 2009-2010.
91. Research and Report on the Importance of Forward Test Years for U.S. Electric Utilities. Edison Electric Institute, 2009-2010.
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94. Benchmarking Research and Testimony for a Midwestern Electric Utility. Oklahoma Gas & Electric, 2009.
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100. Research and Testimony in Support of a Revenue Adjustment Mechanism for Central Vermont Public Service. 2008.
101. Testimony on Tax Issues for a Canadian Regulator. Ontario Energy Board. 2008.
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103. Consultation on Revenue Decoupling and Revenue Adjustment Mechanisms for a Consortium of Massachusetts Electric and Gas Utilities. National Grid. 2007.
104. Consultation on Alternative Regulation for a Western Electric & Gas Distributor Operating under Decoupling. Pacific Gas & Electric. 2007.
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110. Workshop on Alternative Regulation of Major Plant Additions. EEI. 2006.
111. Statistical Benchmarking of A&G Expenses. Michigan Public Service Commission. 2006.
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114. Research and Testimony on the Cost Performance of a New England Power Distributor, Central Vermont Public Service, 2006.
115. Benchmarking and Productivity Research and Testimony for Western Gas and Electric Utilities Operating under Decoupling. San Diego Gas & Electric and Southern California Gas. 2006
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122. Statistical Benchmarking of O&M Expenses for an Australian Power Distributor. SPI Networks. 2004.
123. Research on the Cost Performance of Three English Power Distributors, EDF, 2004.
124. Power Transmission and Distribution PBR and Benchmarking Research for a Canadian Utility. Hydro One Networks, 2001-2003.
125. Indexation of O&M Expenses for an Australian Power Distributor. SPI Networks. 2004.
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127. Statistical Benchmarking Research for Three British Power Distributors. EDF Eastern, EDF London, and EDF Seaboard. 2004.
128. Statistical Benchmarking Research for a British Power Distributor. United Utilities. 2004.
129. White Paper on Unbundled Storage and the Chicago Gas Market for a Midwestern Gas Distributor. Nicor Gas. 2004.
130. Advice on Benchmarking Strategy for a Canadian Trade Association. Canadian Electricity Association. 2004.
131. Workshop on Service Quality Regulation for Regulators. Canadian Electricity Association. 2004.
132. Advice on Productivity for Two British Power Distributors. Northern Electric and Yorkshire Electricity Distribution. 2004.
133. Research and Testimony on Power and Natural Gas Distribution Productivity and Benchmarking for a U.S. Utility Operating under Decoupling. Sempra Energy. 2004.
134. Research and Advice on PBR for a Western Gas Distributor. Questar Gas. 2004.
135. Research, Testimony, and Settlement Support on the Cost Efficiency of O&M Expenses for a Canadian Gas Distributor. Enbridge Gas Distribution. 2004.
136. Testimony on Distributor Cost Benchmarking. Hydro One Networks. 2004.
137. Advice on Statistical Benchmarking for Two British Power Distributors. Northern Electric and Yorkshire Electricity Distribution, 2003.
138. Statistical Benchmarking, Productivity, and Incentive Power Research for a Combined Gas and Electric Company. Baltimore Gas and Electric, 2003.
139. Statistical Benchmarking of Power Transmission. Central Research Institute for the Electric Power Industry (Japan), 2003.

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141. General consultation on PBR Initiative. Union Gas, 2003.
142. Workshop on PBR for Canadian Regulators. Canadian Electricity Association, 2003.
143. Advice on Performance Goals for a U.S. Transmission Company. American Transmission, 2003.
144. Research, Testimony, and Settlement Support on the Cost Efficiency of O&M Expenses. Enbridge Gas Distribution, 2003.
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146. Workshop on Recent Trends in PBR. Entergy Services, 2003.
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148. Future of T&D Regulation, Southern California Edison. October 2002.
149. Benchmarking and Productivity Research and Testimony for a Western Gas and Electric Power Distributor operating under Decoupling. Sempra Energy, 2002.
150. Research on Power Distribution Productivity and Inflation Trends. NSTAR, 2002.
151. Research and Testimony on Benchmarking for Bundled Power Service. AmerenUE, 2002.
152. Statistical Benchmarking for Electric Power Transmission. Transend, 2002.
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154. Research and Testimony on Productivity and PBR Plan Design for a Power Distributor. Bangor Hydro Electric, 2001.
155. Competition Policy in the Power Market of Western Australia, Western Power, 2001.
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158. Statistical Benchmarking for Power Distribution, Queensland Competition Authority, 2001.
159. E-Forum on PBR for Power Procurement. Edison Electric Institute, 2001.
160. Research on TFP and Benchmarking for Gas and Electric Power Distribution. Sempra Energy, 2000.
161. PBR Plan Design for a Natural Gas Distributor Operating under Decoupling. BC Gas, 2000.
162. Research on the Cost Performance of a New England Power Distributor. Central Maine Power, 2000.
163. Power and Natural Gas Procurement PBR. Western Resources, 2000.
164. Service Quality PBR Plan Design and Testimony. Gas and electric power distributors of Massachusetts, 2000.
165. Research and Testimony on Economies of Scale in Local Power Delivery, Metering, and Billing. Electric distributors of Massachusetts, 2000.
166. Economies of Scale and Scope in an Isolated Electric System. Western Power, 2000.
167. Workshop on PBR for Gas and Electric Distribution. Public Service Electric and Gas, 2000.
168. Testimony on PBR for Power Distribution. TXU Electric, 2000.
169. Statistical Benchmarking for Power Transmission. Powerlink Queensland, 2000.
170. Critique of a Commission-Sponsored Benchmarking Study. CitiPower, Powercor, and United Energy, 2000.
171. Unit Cost of Power Distribution. AGL, 2000.
172. Statistical Benchmarking for Bundled Power Services. Niagara Mohawk Power, 1999.
173. Cost Benchmarking for Power Distribution. United Energy, 1999.
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175. Cost Benchmarking for Power Distribution. CitiPower, 1999.

176. Cost Benchmarking for Power Transmission and Distribution. Southern California Edison, 1999.
177. Research and Testimony on Benchmarking and PBR Plan Design for Bundled Power Service. Oklahoma Gas & Electric, 1999.
178. Advice on PBR and Affiliate Relations. Western Resources, 1999.
179. Advice on Code of Conduct Issues for a Western Electric Utility. Public Service of Colorado, 1999.
180. Workshop on PBR for Energy Utilities. World Bank, 1998
181. Design of a Stranded Benefit Passthrough Mechanism for a Restructuring Electric Utility. Niagara Mohawk Power, 1998.
182. Testimony on Functional Separation of Power Generation and Delivery in Illinois. Edison Electric Institute, 1998.
183. Statistical Benchmarking for Power Distribution. Victorian distribution business, 1998-9.
184. PBR Plan Design, Statistical Benchmarking, and Supporting Testimony. Kentucky Utilities & Louisville Gas & Electric, 1998-99.
185. Research and Testimony on Productivity and PBR Plan Design for Bundled Power Service. Hawaiian Electric and Hawaiian Electric Light & Maui Electric, 1998-99.
186. Research and Testimony on Economies of Scale in Power Supply. Hawaiian Electric Company, 1998.
187. Testimony on Brand Names. Edison Electric Institute, 1998.
188. Cross-Subsidization Measures for Restructuring Electric Utilities. Edison Electric Institute, 1998.
189. Cost Structure of Power Distribution. Edison Electric Institute, 1998.
190. Research and Testimony on Gas and Electric Power Distribution Productivity. San Diego Gas & Electric, 1997-98.
191. White Paper and Public Appearances on PBR Options for Power Distributors in Australia. Distribution companies of Victoria, 1997-98.
192. White Paper on Price Cap Regulation (including Service Quality) for Power Distribution. Edison Electric Institute, 1997-99.
193. Productivity, Benchmarking, and PBR Plan Design Research and Testimony for a Gas Distributor. Atlanta Gas Light, 1997.
194. Inflation and Productivity Trends of U.S. Power Distributors. Niagara Mohawk Power, 1997.
195. Statistical Benchmarking and Stranded Cost Recovery. Edison Electric Institute, 1997.
196. Review of a Power Purchase Contract Dispute. City of St. Cloud, MN, 1997.
197. Statistical Benchmarking for Bundled Power Service and Testimony. Pacific Gas & Electric, 1997.
198. Generation and Power Transmission PBR for a Restructuring Canadian Electric Utility, EPCOR, 1997.
199. White Paper on Utility Brand Name Policy. Edison Electric Institute, 1997.
200. Price Cap Plan Design for Power Distribution Services. Comisión de Regulación de Energía y Gas (Colombia), 1997.
201. Productivity and PBR Plan Design Research and Testimony for a Gas Distributor under Decoupling. BC Gas, 1997.
202. Presentation on Performance-Based Regulation for a Natural Gas Distributor, Northwestern Utilities, 1996.
203. Statistical Benchmarking for Bundled Power Service. Pennsylvania Power & Light, 1996.
204. Design of Geographic Zones for Privatized Natural Gas Distributors. Comision Reguladora de Energia (Mexico), 1996.
205. PBR Plan Design for Bundled Power Services. Hawaiian Electric, 1996
206. Testimony on PBR for Power Distribution. Commonwealth Energy System, 1996.

207. Power Distribution Benchmarking for a PJM Utility. Delmarva Power, 1996.
208. Consultation on the Design and Implementation of Price Cap Plans for Natural Gas Production, Transmission, and Distribution. Comision Reguladora de Energia (Mexico), 1996.
209. Productivity and Benchmarking Research and Testimony for a Natural Gas Distributor. Boston Gas, 1996.
210. Stranded Cost Recovery and Power Distribution PBR for a Restructuring U.S. Electric Utility. Delmarva Power, 1996.
211. Development of a Price Cap Plan for a Midwest Gas Distributor. Illinois Power, 1996.
212. Speech on PBR for Electric Utilities. Hawaiian Electric, 1995.
213. Productivity Research and Testimony for a Natural Gas Distributor. NMGas, 1995.
214. Productivity and PBR Plan Design Research and Testimony for a Natural Gas Distributor Operating under Decoupling. Southern California Gas, 1995.
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216. Incentive Regulation Support for a Japanese Electric Utility. Tokyo Electric Power, 1995.
217. Regulatory Strategy for a Restructuring Canadian Electric Utility. Alberta Power, 1995.
218. Productivity Research and PBR Plan Design for Bundled Power Service and Gas Distribution. Public Service Electric & Gas, 1995.
219. White Paper on Performance-Based Regulation. Electric Power Research Institute, 1995.
220. Statistical Benchmarking for Bundled Power Services and Testimony. Southern California Edison, 1994.
221. White Paper on Price Cap Regulation For Electric Utilities. Edison Electric Institute, 1994.
222. Productivity Research for a Natural Gas Distributor, Southern California Gas, 1994.
223. Productivity and PBR Plan Design Research and Testimony. Central Maine Power, 1994.
224. Review of the Southwest Gas Transportation Market. Arizona Electric Power Cooperative, 1993.
225. Development of PBR Options. Southern California Edison, 1993.
226. Productivity and PBR Plan Design Research and Testimony. Niagara Mohawk Power, 1993-94.
227. Design and Negotiation of a Comprehensive Benchmark Incentive Plans for Gas Distribution and Bundled Power Service. Niagara Mohawk Power, 1992.
228. Gas Transportation Strategy for an Arizona Electric Utility. AEPCO, 1992.
229. Gas Supply Cost Indexes for Incentive Regulation. Pacific Gas & Electric, 1992.
230. Benchmarking Gas Supply Services and Testimony. Niagara Mohawk Power, 1992.
231. Efficient Rate Design for Interstate Gas Transporters. AEPCO, 1991.
232. Cost Performance Indexes for Gas and Electric Utilities for Use in PBR. Niagara Mohawk Power, 1991.
233. Productivity Growth Estimates for U.S. Gas Distributors and Their Use in PBR. Southern California Gas, 1991.
234. Sales Promotion Policies of Gas Distributors. Northern States Power-Wisconsin, 1991.
235. Economics of Electric Revenue Adjustment Mechanisms. Niagara Mohawk Power, 1991.
236. Workshop on PBR for Electric Utilities. Southern Company Services, 1991.
237. Comprehensive Performance Indexes for Electric and Gas Distribution Utilities. Niagara Mohawk Power, 1990-1991.
238. Measurement of Productivity Trends for the U.S. Electric Power Industry. Niagara Mohawk Power, 1990-91.
239. Measuring Productivity Trends in the Local Gas Distribution Industry. Niagara Mohawk Power, 1990.

240. Measuring the Productivity Growth of Gas Transmission Companies. Interstate Natural Gas Association of America, 1990.
241. Incentive Regulation: Can it Pay for Interstate Gas Companies? Southern Natural Gas, 1989.
242. Design of Time-of-Use Rates for Residential Customers. Iowa Power, 1989.
243. Measuring Load Relief from Interruptible Services. New England Electric Power Service, 1989.
244. Customer Response to Interruptible Service Programs. Southern California Edison, 1989.
245. Modeling Customer Response to Curtailable Service Programs. Electric Power Research Institute, 1989.
246. Impact of the Natural Gas Policy Act on U.S. Production and Wellhead Prices. New England Fuel Institute, 1981
247. Competition in the Natural Gas Market of the San Juan Basin. Public Service of New Mexico, 1981.

## Publications

1. "Innovative Regulatory Tools for Addressing an Increasingly Complex Energy Landscape: 2023 Update," (With Matthew Makos, Gretchen Waschbusch, and Benjamin Cohen), Edison Electric Institute, February 2024.
2. "Impact of Multiyear Rate Plans on Power Distributor Productivity: Evidence from Alberta," (with David Hovde, Rebecca Kavan, and Matthew Makos), *The Electricity Journal*, Volume 36, Issue 5, June 2023.
3. "PBR and Climate Change" (With Matthew Makos), *Climate and Energy*, Volume 37, Issue 12, July 2021.
4. "Escalating Power Distributor O&M Revenue" (With David Hovde), *Electricity Journal*, Volume 34, Issue 6, July 2021.
5. "Four Common Myths About Performance-based Regulation," *Utility Dive*, April 27, 2021.
6. "Revenue Decoupling at 40, Venerable PBR Tool Goes National," (With Matthew Makos), *Public Utilities Fortnightly*, April 2021.
7. "State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities," (With Jeff Deason), Lawrence Berkeley National Laboratory, July 2017.
8. "Performance-Based Regulation in a High Distributed Energy Resources Future," (With Tim Woolf), Lawrence Berkeley National Laboratory, January 2016.
9. "Alternative Regulation for Emerging Utility Challenges: 2015 Update" (With Matthew Makos and Gretchen Waschbusch), Edison Electric Institute, November 2015.
10. "Alternative Regulation for Evolving Utility Challenges: An Updated Survey" (With Matthew Makos and Gretchen Waschbusch), Edison Electric Institute, 2013.
11. "Innovative Regulation: A Survey of Remedies for Regulatory Lag" (With Matt Makos and Gentry Johnson), Edison Electric Institute, April 2011.
12. Edison Electric Institute, August 2010.
13. "Econometric TFP Targets, Incentive Regulation and the Ontario Gas Distribution Industry" (With Lullit Getachew), *Review of Network Economics*, December 2009
14. "The Economics and Regulation of Power Transmission and Distribution: The Developed World Case" (with Lullit Getachew), in Lester C. Hunt and Joanne Evans, eds., *International Handbook on the Economics of Energy*, 2009.
15. "Alternative Regulation, Benchmarking, and Efficient Diversification", *USAEE Dialogue*, August 2009.

16. "Statistical Benchmarking in Utility Regulation: Role, Standards and Methods," (with Lullit Getachew), Energy Policy, 2009.
17. "Price Control Regulation in North America: Role of Indexing and Benchmarking," Electricity Journal, January 2009.
18. "AltReg Rate Designs Address Declining Average Gas Use" (with Lullit Getachew, David Hovde, and Steve Fenrick), Natural Gas and Electricity, 2008.
19. "Alternative Regulation for Infrastructure Cost Recovery", Edison Electric Institute, January 2007.
20. "Regulation of Gas Distributors with Declining Use Per Customer" USAEE Dialogue August 2006.
21. "Alternative Regulation for North American Electric Utilities" (With Lawrence Kaufmann), Electricity Journal, July 2006.
22. "Assessing Rate Trends of U.S. Electric Utilities", Edison Electric Institute, January 2006.
23. "Econometric Cost Benchmarking of Power Distribution Cost" (with Lullit Getachew and David Hovde), Energy Journal, July 2005.
24. "Alternative Regulation, Benchmarking, and Efficient Diversification" (with Lullit Getachew), PEG Working Paper, November 2004.
25. "Performance-Based Regulation Developments for Gas Utilities (with Lawrence Kaufmann), Natural Gas and Electricity, April 2004.
26. "Performance-Based Regulation and Energy Utility Business Strategy (With Lawrence Kaufmann), in Natural Gas and Electric Power Industries Analysis 2003, Houston: Financial Communications, Forthcoming.
27. "Performance-Based Regulation and Business Strategy" (with Lawrence Kaufmann), Natural Gas and Electricity, February 2003
28. "Performance-Based Regulation for Energy Utilities (with Lawrence Kaufmann)," Energy Law Journal, Fall 2002.
29. Price Caps for Distribution Service: Do They Make Sense? (with Eric Ackerman and Lawrence Kaufmann), Edison Times, 1999.
30. The Cost Structure of Power Distribution with Implications for Public Policy (with Lawrence Kaufmann), Washington: Edison Electric Institute 1999.
31. Controlling for Cross-Subsidization in Electric Utility Regulation (with Lawrence Kaufmann), Washington: Edison Electric Institute, 1998.
32. Price Cap Regulation for Power Distribution (with Larry Kaufmann), Washington: Edison Electric Institute, 1998.
33. Branding Electric Utility Products: Analysis and Experience in Regulated Industries (with Lawrence Kaufmann), Washington: Edison Electric Institute, 1997.
34. Forecasting the Productivity Growth of Natural Gas Distributors (with Lawrence Kaufmann). AGA Forecasting Review, Vol. 5, March 1996.
35. Performance-Based Regulation of U.S. Electric Utilities: The State of the Art and Directions for Further Research (with Lawrence Kaufmann). Palo Alto: Electric Power Research Institute, December 1995.
36. The Treatment of Z Factors in Price Cap Plans (with Lawrence Kaufmann), Applied Economics Letters 2 1995.
37. A Price Cap Designers Handbook (with Lawrence Kaufmann). (Washington: Edison Electric Institute, 1995.)

38. TFP Trends of U.S. Electric Utilities, 1975-92 (with Herb Thompson). Proceedings of the Ninth NARUC Biennial Regulatory Information Conference, (Columbus: National Regulatory Research Institute, 1994).
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41. Futures Prices and Hidden Stocks of Refined Oil Products. In O. Guvanen, W.C. Labys, and J.B. Lesourd, editors, *International Commodity Market Models: Advances in Methodology and Applications* (London: Chapman and Hall, 1991).
42. Evaluating Alternative Measures of Credited Load Relief: Results From a Recent Study For New England Electric. In *Demand Side Management: Partnerships in Planning for the Next Decade* (Palo Alto: Electric Power Research Institute, 1991).
43. Competitive Speculative Storage and the Cost of Petroleum Supply. *The Energy Journal* 10 (1) 1989.
44. Theory of Pricing and Storage of Field Crops With an Application to Soybeans [with Joseph Glauber (senior author), Mario Miranda, and Peter Helmberger]. University of Wisconsin Madison College of Agricultural and Life Sciences Research Report no. R3421, 1988.
45. Speculative Stocks and Working Stocks. *Economic Letters* 28 1988.
46. Modeling the Convenience Yield from Precautionary Storage: The Case of Distillate Fuel Oil. *Energy Economics* 10 (4) 1988.
47. A Competitive Model of Primary Sector Storage of Refined Oil Products. July 1987, *Resources and Energy* 10 (2) 1988.
48. Review of Oil Prices, Market Response, and Contingency Planning, by George Horwich and David Leo Weimer, (Washington, American Enterprise Institute, 1984), *Energy Journal* 8 (3) 1988.
49. Monopoly Power, Rigid Prices, and the Management of Inventories by Metals Producers. *Materials and Society* 12 (1) 1988.
50. Storage, Monopoly Power, and Sticky Prices. *les Cahiers du CETAI* no. 87 03 March 1987.
51. Pricing and Storage of Field Crops: A Quarterly Model Applied to Soybeans (with junior authors Joseph Glauber, Mario Miranda, and Peter Helmberger). *American Journal of Agricultural Economics* 69 (4), November 1987.
52. Modeling the Convenience Yield from Precautionary Storage of Refined Oil Products (with junior author Bok Jae Lee) in John Rowse, ed. *World Energy Markets: Coping with Instability* (Calgary, AL: Friesen Printers, 1987).
53. Assessing Metals Demand in Less Developed Countries: Another Look at the Leapfrog Effect. *Materials and Society* 10 (3), 1986.
54. The Changing Role of the United States in World Mineral Trade in W.R. Bush, editor, *The Economics of Internationally Traded Minerals*. (Littleton, CO: Society of Mining Engineers, 1986).
55. Review of Energy, Foresight, and Strategy, Thomas Sargent, ed. (Baltimore: Resources for the Future, 1985). *Energy Journal* 6 (4), 1986.
56. Public vs. Private Management of Mineral Inventories: A Statement of the Issues. *Earth and Mineral Sciences* 53, (3) Spring 1984.

## Conference Presentations

1. NARUC Regulatory Training Initiative course on Performance-based Regulation, (virtual), November 2025
2. Wisconsin Public Utilities Institute, Energy Utility Basics Course, Madison WI, October 2025
3. Massachusetts Department of Energy Resources (DOER), Massachusetts Electric Rate Task Force, (virtual), September 2025
4. CAMPUT Connection, (virtual), January 2025
5. EUCI Advanced Rate Design Conference, (virtual), December 2024
6. NARUC Regulatory Training Initiative course on Performance-based Regulation, (virtual), October 2024
7. Wisconsin Public Utilities Institute, Energy Utility Basics Course, Madison WI, October 2024
8. NARUC-NASEO Resilience Regulatory Mechanisms Cohort, (virtual), September 2024
9. Michigan State University, Institute of Public Utilities Fundamentals Course, (virtual), August 2024
10. Society of Utility Regulatory Financial Analysts (SURFA), Richmond VA, April 2024
11. Osgoode Hall Law School of York University, Public Utility Law, (virtual), March 2024
12. EUCI Advanced Rate Design Conference, Denver CO, December 2023
13. Panelist on Rate Design at the Critical Consumer Issues Forum at the NARUC Annual Meeting in La Quinta CA, November 2023
14. Panelist on Alternative Regulation for Emerging Electric Industry Challenges at the NARUC Annual Meeting in La Quinta CA, November 2023
15. NARUC Regulatory Training Initiative course on Performance-based Regulation, (virtual), October 2023
16. Wisconsin Public Utilities Institute, Energy Utility Basics Course, Madison WI, October 2023
17. NARUC PBR State Working Group presentation on "Alternative Regulation and Incentives for Capital Efficiency," (virtual), September 2023
18. Michigan State University, Institute of Public Utilities Fundamentals Course, (virtual), August 2023
19. Edison Electric Institute, Electric Rates Course, Madison WI, July 2023
20. NARUC Staff Subcommittee on Accounting and Finance, 2023 Spring Conference, Oklahoma City OK, April 2023
21. Wisconsin Public Service Commission, Workshop for Roadmap to Zero Carbon Investigation, October 2022
22. Wisconsin Public Utilities Institute, Energy Utility Basics Course, October 2022
23. Edison Electric Institute, Rates and Regulatory Affairs Committee, Pittsburgh PA, September 2022
24. Michigan State University, Institute of Public Utilities Fundamentals Course, (virtual), August 2022
25. Edison Electric Institute, Electric Rates Course, Madison WI, July 2022
26. National Association of State Utility Consumer Advocates, 2022 Mid-year Meeting, Indianapolis IN, June 2022
27. National Conference of State Legislators' Energy Supply Task Force, Seattle WA, May 2022
28. Osgoode Hall Law School of York University, Public Utility Law, (virtual), March 2022
29. Edison Electric Institute, Transmission, Distribution, Metering & Mutual Assistance Conference, (virtual), October 2021
30. Wisconsin Public Utilities Institute, Energy Utility Basics Course, (virtual), September 2021
31. Edison Electric Institute, Electric Rates Advanced Course, (virtual), July 2021

32. NARUC PBR State Working Group, (virtual), June 2021
33. National Association of State Utility Consumer Advocates, (virtual), June 2021
34. Wisconsin Public Utilities Institute, (virtual), October 2020
35. British Columbia Utilities Commission, (virtual), September 2020
36. Wisconsin Public Utilities Institute, Madison WI, October 2019
37. Edison Electric Institute, Madison WI, July 2019
38. Pennsylvania Public Utility Law Conference, Harrisburg, PA, May 2019
39. Carilec CEOs & Leadership Conference, St. Lucia, May 2019
40. Hawaii Public Utilities Commission, Honolulu, HI, November 2018
41. Wisconsin Public Utilities Institute, Madison WI, October 2018
42. Financial Research Institute, Columbia MO, September 2018
43. Hawaii Public Utilities Commission, Honolulu, HI, July 2018
44. NARUC, St Paul MN, January 2018
45. University of Wisconsin Department of Applied Economics, October 2017
46. Wisconsin Public Utilities Institute, Madison WI, October 2017
47. New England Conference of Public Utilities Commissioners, Hallowell ME, September 2017
48. Lawrence Berkeley National Laboratory, Webinar, August 2017
49. Edison Electric Institute, Madison WI, July 2017
50. National Conference of Regulatory Attorneys, Portland OR, May 2017
51. National Regulatory Research Institute, Webinar, May 2017
52. Washington State House of Representatives, Technology and Economic Development Committee, January 2017
53. Lawrence Berkeley National Laboratory, Webinar, November 2016
54. Edison Electric Institute, Madison WI, July 2016
55. Society of Utility Regulatory Financial Analysts (SURFA), Indianapolis IN, April 2016
56. Wisconsin Public Service Commission, Madison WI, March 2016
57. Great Plains Institute, Minneapolis MN, February 2016
58. Lawrence Berkeley National Laboratory, Vermont Future of Electric Utility Regulation Workshop, January 2016
59. Edison Electric Institute, Madison WI, July 2015
60. Law Seminars, Las Vegas NV, March 2015
61. Great Plains Institute, St. Paul MN, September 2014
62. Financial Research Institute, Columbia MO, September 2014
63. Edison Electric Institute, Madison WI, July 2014
64. EUCI, Chicago IL April 2014 [Conference chair]
65. National Regulatory Research Institute, Teleseminar, August 2013
66. Edison Electric Institute, Madison WI, July 2013
67. Edison Electric Institute, Washington DC, May 2013
68. Edison Electric Institute Washington DC, April 2013
69. Law Seminars, Las Vegas NV, March 2013
70. EUCI, Chicago IL, November 2012 [Conference chair]
71. Edison Electric Institute, Madison WI, July 2012

72. SURFA, Washington DC, April 2012
73. EUCI, Philadelphia PA, November 2011 [Conference chair]
74. Edison Electric Institute, Madison WI, July 2011
75. EUCI, Toronto, November 2010 [Conference chair]
76. Edison Electric Institute, Madison WI, July 2010
77. EUCI, Cambridge MA, March 2010 [Conference chair]
78. Edison Electric Institute, Madison WI, July 2009
79. Edison Electric Institute, national eforum, May 2009
80. EUCI, Cambridge MA, March 2009 [Conference chair]
81. Edison Electric Institute, Madison WI, August 2008
82. EUCI, Toronto, March 2008 [Conference chair]
83. EUCI, Chicago, July 2008 [Conference chair]
84. EUCI, Denver, 2008 [Conference chair]
85. Institute of Public Utilities, Lansing MI, 2007
86. Edison Electric Institute, Madison WI, July-August 2007.
87. Massachusetts Energy Distribution Companies, Waltham MA, July 2007.
88. EUCI, Seattle WA, 2007 [Conference chair]
89. Edison Electric Institute, national eforum, 2007
90. Edison Electric Institute, Madison WI, August 2007
91. Law Seminars, Las Vegas, February 2007
92. EUCI, Arlington VA September 2006
93. EUCI, Arlington VA, September 2006 [Conference chair]
94. Edison Electric Institute, Madison WI, August 2006
95. Ontario Energy Board, Toronto ON, June 2006
96. EUCI, Seattle, May 2006 [Conference chair]
97. Edison Electric Institute, eforum, March 2005
98. CAMPUT, Halifax NS, May 2004
99. Eurelectric, Brussels, Belgium, October 2003
100. Elforsk, Stockholm, Sweden, June 2003
101. CAMPUT, Banff, ALTA, May 2003
102. Louisiana Public Service Commission, Baton Rouge LA, February 2003
103. Canadian Gas Association, Toronto ON, February 2003
104. Ontario Energy Association, Toronto ON, November 2002
105. Canadian Electricity Association, Montreal PQ, September 2002
106. Canadian Electricity Association, Whistler BC, May 2002
107. Canadian Gas Association, Toronto ON, March 2002
108. Infocast, Washington DC, December 2001 [Conference chair]
109. Florida 2000 Commission, Tampa FL, August 2001
110. Infocast, Boston MA, March 2001 [Conference chair]
111. Wisconsin Public Utility Institute, Madison WI, November 2000
112. Infocast, Washington DC, October 2000

113. IOU-EDA, Brewster MA, July 2000
114. Edison Electric Institute, July 2000
115. Infocast, Chicago IL, July 2000 [Conference chair]
116. Edison Electric Institute, San Antonio TX, April 2000
117. Center for Business Intelligence, Miami, FL, March 2000
118. IBC Conferences, Washington, DC, February 2000
119. Edison Electric Institute, Indianapolis, IN, August 1999
120. University of Southern California, Los Angeles CA, April 1999
121. Edison Electric Institute, Newport RI, September 1998
122. University of Indiana, Indianapolis IN, August 1998
123. Electric Utility Consultants, Denver CO, April 1998
124. Edison Electric Institute, Arlington VA, March 1998
125. Infocast, Miami Beach FL, Oct. 1997
126. American Gas Association, Washington DC [national telecast], September 1997
127. American Gas Association, Edison Electric Institute, Advanced Public Utility Accounting School, Irving TX, Sept. 1997
128. Michigan State University Public Utilities Institute, Edmonton AL, July 1997
129. IBC Conferences, Houston TX, January 1997
130. Michigan State University Public Utilities Institute, Williamsburg VA, December 1996
131. Center for Regulatory Studies, Springfield IL, December 1996
132. IBC Conferences, Washington DC, October 1996
133. American Gas Association, Arlington VA, July 1996
134. IBC Conferences, San Antonio TX, June 1996
135. AIC Conferences, Orlando FL, April 1996
136. IBC Conferences, San Francisco CA, April 1996
137. Edison Electric Institute, Washington DC, December 1995
138. Michigan State University Public Utilities Institute, Williamsburg VA, December 1996
139. Illinois Commerce Commission, St. Charles IL, June 1995
140. National Association of Regulatory Utility Commissioners, Orlando FL, March 1995
141. Edison Electric Institute, Washington DC, March 1995
142. National Association of Regulatory Utility Commissioners, Kalispell MT, May 1994
143. National Association of Regulatory Utility Commissioners, Williamsburg VA, January 1994
144. Midwest Gas Association, Aspen, CO, October 1993
145. National Association of Regulatory Utility Commissioners, Columbus OH, September 1992
146. New York State Energy Office, Saratoga Springs NY, October 1990
147. Electric Power Research Institute, Milwaukee WI, May 1990
148. Electric Council of New England, Boston MA, November 1989
149. Association d'Econometrie Appliqué, Washington DC, October 1988
150. American Agricultural Economics Association, Knoxville TN, August 1988
151. International Association of Energy Economists, Calgary AL, July 1987
152. American Institute of Mining Engineering, New Orleans LA, March 1986

## **Journal Referee**

Agribusiness

American Journal of Agricultural Economics

Energy Journal

Journal of Economic Dynamics and Control

Materials and Society

## **Association Memberships (active)**

International Association for Energy Economics

Wisconsin Public Utilities Institute