

FORM A

Proceeding: EB-2018-0218

ACKNOWLEDGMENT OF EXPERT'S DUTY

1. My name is Mark Newton Lowry.....(name). I live at Madison..... (city), in the State..... (province/state) of Wisconsin.....

2. I have been engaged by or on behalf of Ontario Energy Board..... (name of party/parties) to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.

3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
 - (a) to provide opinion evidence that is fair, objective and non-partisan;
 - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
 - (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.

4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date 4 February, 2019.....



Signature

RESUME OF MARK NEWTON LOWRY

February 2019

Home Address 1511 Sumac Drive
Madison, WI 53705
(608) 233-4822

Business Address 44 E. Mifflin St., Suite 601
Madison, WI 53703
(608) 257-1522 Ext. 23

Date of Birth August 7, 1952

Education High School: Hawken School, Gates Mills, Ohio, 1970
BA: Ibero-American Studies, University of Wisconsin-Madison, May 1977
Ph.D.: Applied Economics, University of Wisconsin-Madison, May 1984

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, Montreal, Quebec.**

Research on the behavior of inventories in metal markets.

Major Consulting Projects

1. Competition in the Natural Gas Market of the San Juan Basin. Public Service of New Mexico, 1981.
2. Impact of the Natural Gas Policy Act on U.S. Production and Wellhead Prices. New England Fuel Institute, 1981
3. Modeling Customer Response to Curtailable Service Programs. Electric Power Research Institute, 1989.
4. Customer Response to Interruptible Service Programs. Southern California Edison, 1989.
5. Measuring Load Relief from Interruptible Services. New England Electric Power Service, 1989.
6. Design of Time-of-Use Rates for Residential Customers. Iowa Power, 1989.
7. Incentive Regulation: Can it Pay for Interstate Gas Companies? Southern Natural Gas, 1989.
8. Measuring the Productivity Growth of Gas Transmission Companies. Interstate Natural Gas Association of America, 1990.
9. Measuring Productivity Trends in the Local Gas Distribution Industry. Niagara Mohawk Power, 1990.
10. Measurement of Productivity Trends for the U.S. Electric Power Industry. Niagara Mohawk Power, 1990-91.
11. Comprehensive Performance Indexes for Electric and Gas Distribution Utilities. Niagara Mohawk Power, 1990-1991.
12. Workshop on PBR for Electric Utilities. Southern Company Services, 1991.
13. Economics of Electric Revenue Adjustment Mechanisms. Niagara Mohawk Power, 1991.
14. Sales Promotion Policies of Gas Distributors. Northern States Power-Wisconsin, 1991.
15. Productivity Growth Estimates for U.S. Gas Distributors and Their Use in PBR. Southern California Gas, 1991.
16. Cost Performance Indexes for Gas and Electric Utilities for Use in PBR. Niagara Mohawk Power, 1991.
17. Efficient Rate Design for Interstate Gas Transporters. AEPCO, 1991.
18. Benchmarking Gas Supply Services and Testimony. Niagara Mohawk Power, 1992.
19. Gas Supply Cost Indexes for Incentive Regulation. Pacific Gas & Electric, 1992.
20. Gas Transportation Strategy for an Arizona Electric Utility. AEPCO, 1992.
21. Design and Negotiation of a Comprehensive Benchmark Incentive Plans for Gas Distribution and Bundled Power Service. Niagara Mohawk Power, 1992.
22. Productivity Research, PBR Plan Design, and Testimony. Niagara Mohawk Power, 1993-94.
23. Development of PBR Options. Southern California Edison, 1993.
24. Review of the Southwest Gas Transportation Market. Arizona Electric Power Cooperative, 1993.

25. Productivity Research and Testimony in Support of a Price Cap Plan. Central Maine Power, 1994.
26. Productivity Research for a Natural Gas Distributor, Southern California Gas, 1994.
27. White Paper on Price Cap Regulation For Electric Utilities. Edison Electric Institute, 1994.
28. Statistical Benchmarking for Bundled Power Services and Testimony. Southern California Edison, 1994.
29. White Paper on Performance-Based Regulation. Electric Power Research Institute, 1995.
30. Productivity Research and PBR Plan Design for Bundled Power Service and Gas Distribution. Public Service Electric & Gas, 1995.
31. Regulatory Strategy for a Restructuring Canadian Electric Utility. Alberta Power, 1995.
32. Incentive Regulation Support for a Japanese Electric Utility. Tokyo Electric Power, 1995.
33. Regulatory Strategy for a Restructuring Northeast Electric Utility. Niagara Mohawk Power, 1995.
34. Productivity and PBR Plan Design Research and Testimony for a Natural Gas Distributor Operating under Decoupling. Southern California Gas, 1995.
35. Productivity Research and Testimony for a Natural Gas Distributor. NMGas, 1995.
36. Speech on PBR for Electric Utilities. Hawaiian Electric, 1995.
37. Development of a Price Cap Plan for a Midwest Gas Distributor. Illinois Power, 1996.
38. Stranded Cost Recovery and Power Distribution PBR for a Restructuring U.S. Electric Utility. Delmarva Power, 1996.
39. Productivity and Benchmarking Research and Testimony for a Natural Gas Distributor. Boston Gas, 1996.
40. Consultation on the Design and Implementation of Price Cap Plans for Natural Gas Production, Transmission, and Distribution. Comision Reguladora de Energia (Mexico), 1996.
41. Power Distribution Benchmarking for a PJM Utility. Delmarva Power, 1996.
42. Testimony on PBR for Power Distribution. Commonwealth Energy System, 1996.
43. PBR Plan Design for Bundled Power Services. Hawaiian Electric, 1996
44. Design of Geographic Zones for Privatized Natural Gas Distributors. Comision Reguladora de Energia (Mexico), 1996.
45. Statistical Benchmarking for Bundled Power Service. Pennsylvania Power & Light, 1996.
46. Presentation on Performance-Based Regulation for a Natural Gas Distributor, Northwestern Utilities, 1996.
47. Productivity Research and PBR Plan Design (including Service Quality) and Testimony for a Gas Distributor under Decoupling. BC Gas, 1997.
48. Price Cap Plan Design for Power Distribution Services. Comisión de Regulación de Energía y Gas (Colombia), 1997.
49. White Paper on Utility Brand Name Policy. Edison Electric Institute, 1997.
50. Generation and Power Transmission PBR for a Restructuring Canadian Electric Utility, EPCOR, 1997.
51. Statistical Benchmarking for Bundled Power Service and Testimony. Pacific Gas & Electric, 1997.
52. Review of a Power Purchase Contract Dispute. City of St. Cloud, MN, 1997.
53. Statistical Benchmarking and Stranded Cost Recovery. Edison Electric Institute, 1997.
54. Inflation and Productivity Trends of U.S. Power Distributors. Niagara Mohawk Power, 1997.
55. PBR Plan Design, Statistical Benchmarking, and Testimony for a Gas Distributor. Atlanta Gas Light, 1997.
56. White Paper on Price Cap Regulation (including Service Quality) for Power Distribution. Edison Electric Institute, 1997-99.
57. White Paper and Public Appearances on PBR Options for Power Distributors in Australia. Distribution companies of Victoria, 1997-98.
58. Research and Testimony on Gas and Electric Power Distribution TFP. San Diego Gas & Electric, 1997-98.
59. Cost Structure of Power Distribution. Edison Electric Institute, 1998.
60. Cross-Subsidization Measures for Restructuring Electric Utilities. Edison Electric Institute, 1998.
61. Testimony on Brand Names. Edison Electric Institute, 1998.
62. Research and Testimony on Economies of Scale in Power Supply. Hawaiian Electric Company, 1998.
63. Research and Testimony on Productivity and PBR Plan Design for Bundled Power Service. Hawaiian Electric and Hawaiian Electric Light & Maui Electric, 1998-99.

64. PBR Plan Design, Statistical Benchmarking, and Supporting Testimony. Kentucky Utilities & Louisville Gas & Electric, 1998-99.
65. Statistical Benchmarking for Power Distribution. Victorian distribution business, 1998-9.
66. Testimony on Functional Separation of Power Generation and Delivery in Illinois. Edison Electric Institute, 1998.
67. Design of a Stranded Benefit Passthrough Mechanism for a Restructuring Electric Utility. Niagara Mohawk Power, 1998.
68. Workshop on PBR for Energy Utilities. World Bank, 1998
69. Advice on Code of Conduct Issues for a Western Electric Utility. Public Service of Colorado, 1999.
70. Advice on PBR and Affiliate Relations. Western Resources, 1999.
71. Research and Testimony on Benchmarking and PBR Plan Design for Bundled Power Service. Oklahoma Gas & Electric, 1999.
72. Cost Benchmarking for Power Transmission and Distribution. Southern California Edison, 1999.
73. Cost Benchmarking for Power Distribution. CitiPower, 1999.
74. Cost Benchmarking for Power Distribution. Powercor, 1999.
75. Cost Benchmarking for Power Distribution. United Energy, 1999.
76. Statistical Benchmarking for Bundled Power Services. Niagara Mohawk Power, 1999.
77. Unit Cost of Power Distribution. AGL, 2000.
78. Critique of a Commission-Sponsored Benchmarking Study. CitiPower, Powercor, and United Energy, 2000.
79. Statistical Benchmarking for Power Transmission. Powerlink Queensland, 2000.
80. Testimony on PBR for Power Distribution. TXU Electric, 2000.
81. Workshop on PBR for Gas and Electric Distribution. Public Service Electric and Gas, 2000.
82. Economies of Scale and Scope in an Isolated Electric System. Western Power, 2000.
83. Research and Testimony on Economies of Scale in Local Power Delivery, Metering, and Billing. Electric distributors of Massachusetts, 2000.
84. Service Quality PBR Plan Design and Testimony. Gas and electric power distributors of Massachusetts, 2000.
85. Power and Natural Gas Procurement PBR. Western Resources, 2000.
86. Research on the Cost Performance of a New England Power Distributor. Central Maine Power, 2000.
87. PBR Plan Design for a Natural Gas Distributor Operating under Decoupling. BC Gas, 2000.
88. Research on TFP and Benchmarking for Gas and Electric Power Distribution. Sempra Energy, 2000.
89. E-Forum on PBR for Power Procurement. Edison Electric Institute, 2001.
90. Statistical Benchmarking for Power Distribution, Queensland Competition Authority, 2001.
91. Productivity Research and PBR Plan Design. Hydro One Networks, 2001.
92. PBR Presentation to Governor Bush Energy 2000 Commission. Edison Electric Institute, 2001.
93. Competition Policy in the Power Market of Western Australia, Western Power, 2001.
94. Research and Testimony on Productivity and PBR Plan Design for a Power Distributor. Bangor Hydro Electric, 2001.
95. Statistical Benchmarking for three Australian Gas Utilities. Client name confidential, 2001.
96. Statistical Benchmarking for Electric Power Transmission. Transend, 2002.
97. Research and Testimony on Benchmarking for Bundled Power Service. AmerenUE, 2002.
98. Research on Power Distribution Productivity and Inflation Trends. NSTAR, 2002.
99. Benchmarking and Productivity Research and Testimony for a Western Gas and Electric Power Distributor operating under Decoupling. Sempra Energy, 2002.
100. Future of T&D Regulation, Southern California Edison. October 2002.
101. Research on the Incentive Power of Alternative Regulatory Systems. Hydro One Networks, 2002.
102. Workshop on Recent Trends in PBR. Entergy Services, 2003.
103. Workshop on PBR for Louisiana's Public Service Commission. Entergy Services, February 2003.
104. Research, Testimony, and Settlement Support on the Cost Efficiency of O&M Expenses. Enbridge Gas Distribution, 2003.
105. Advice on Performance Goals for a U.S. Transmission Company. American Transmission, 2003.
106. Workshop on PBR for Canadian Regulators. Canadian Electricity Association, 2003.
107. General consultation on PBR Initiative. Union Gas, 2003.

108. Statistical Benchmarking and PBR Plan for Four Bolivian Power Distributors. Superintendencia de Electricidad, 2003.
109. Statistical Benchmarking of Power Transmission. Central Research Institute for the Electric Power Industry (Japan), 2003.
110. Statistical Benchmarking, Productivity, and Incentive Power Research for a Combined Gas and Electric Company. Baltimore Gas and Electric, 2003.
111. Advice on Statistical Benchmarking for Two British Power Distributors. Northern Electric and Yorkshire Electricity Distribution, 2003.
112. Testimony on Distributor Cost Benchmarking. Hydro One Networks. 2004.
113. Research, Testimony, and Settlement Support on the Cost Efficiency of O&M Expenses for a Canadian Gas Distributor. Enbridge Gas Distribution. 2004.
114. Research and Advice on PBR for a Western Gas Distributor. Questar Gas. 2004.
115. Research and Testimony on Power and Natural Gas Distribution Productivity and Benchmarking for a U.S. Utility Operating under Decoupling. Sempra Energy. 2004.
116. Advice on Productivity for Two British Power Distributors. Northern Electric and Yorkshire Electricity Distribution. 2004.
117. Workshop on Service Quality Regulation for Regulators. Canadian Electricity Association. 2004.
118. Advice on Benchmarking Strategy for a Canadian Trade Association. Canadian Electricity Association. 2004.
119. White Paper on Unbundled Storage and the Chicago Gas Market for a Midwestern Gas Distributor. Nicor Gas. 2004.
120. Statistical Benchmarking Research for a British Power Distributor. United Utilities. 2004.
121. Statistical Benchmarking Research for Three British Power Distributors. EDF Eastern, EDF London, and EDF Seaboard. 2004.
122. Benchmarking Testimony for Three Ontario Power Distributors. Hydro One, Toronto Hydro, and Enersource Hydro Mississauga. 2004.
123. Indexation of O&M Expenses for an Australian Power Distributor. SPI Networks. 2004.
124. Power Transmission and Distribution PBR and Benchmarking Research for a Canadian Utility. Hydro One Networks, 2001-2003.
125. Research on the Cost Performance of Three English Power Distributors, EDF, 2004.
126. Statistical Benchmarking of O&M Expenses for an Australian Power Distributor. SPI Networks. 2004.
127. Testimony on Statistical Benchmarking of Power Distribution. Hydro One Networks. 2005.
128. Statistical Benchmarking for a Southeastern U.S. Bundled Power Service Utility. Progress Energy Florida. 2005.
129. Statistical Benchmarking of a California Nuclear Plant. San Diego Gas & Electric. 2005.
130. Explaining Recent Rate Requests of U.S. Electric Utilities: Results from Input Price and Productivity Research. Edison Electric Institute. 2005.
131. Power Transmission PBR and Benchmarking Support and Testimony. Trans-Energie. 2005.
132. Power Distribution Benchmarking Research and Testimony. Central Vermont Public Service. 2006.
133. Benchmarking and Productivity Research and Testimony for Western Gas and Electric Utilities Operating under Decoupling. San Diego Gas & Electric and Southern California Gas. 2006
134. Research and Testimony on the Cost Performance of a New England Power Distributor, Central Vermont Public Service, 2006.
135. White Paper on Alternative Regulation for Major Plant Additions for a U.S. Trade Association. EEI. 2006.
136. Consultation on Price Cap Regulation for Provincial Power Distributors. Ontario Energy Board. 2006.
137. Statistical Benchmarking of A&G Expenses. Michigan Public Service Commission. 2006.
138. Workshop on Alternative Regulation of Major Plant Additions. EEI. 2006.
139. White Paper on Power Distribution Benchmarking for a Canadian Trade Association. Canadian Electricity Association. 2006.
140. Consultation on a PBR Strategy for Power Transmission. BC Transmission. 2006.
141. Consultation on a Canadian Trade Association's Benchmarking Program. Canadian Electricity Association. 2007.

142. Testimony on PBR Plan for Central Maine Power, 2007.
143. Report and Testimony on Role of Power Distribution Benchmarking in Regulation. Fortis Alberta, 2006.
144. Consultation on Alternative Regulation for a Western Electric & Gas Distributor Operating under Decoupling. Pacific Gas & Electric. 2007.
145. Consultation on Revenue Decoupling and Revenue Adjustment Mechanisms for a Consortium of Massachusetts Electric and Gas Utilities. National Grid. 2007.
146. Gas Distribution Productivity Research and Testimony in Support of Decoupling and Other PBR Plans for a Canadian Regulator. Ontario Energy Board. 2007.
147. Testimony on Tax Issues for a Canadian Regulator. Ontario Energy Board. 2008.
148. Research and Testimony in Support of a Revenue Adjustment Mechanism for Central Vermont Public Service. 2008.
149. Consultation on Alternative Regulation for a Midwestern Electric Utility. Xcel Energy. 2008.
150. Research and Draft Testimony in Support of a Revenue Decoupling Mechanism for a Large Midwestern Gas Utility. NICOR Gas, 2008.
151. White Paper: Use of Statistical Benchmarking in Regulation. Canadian Electricity Association. 2005-2009.
152. Statistical Cost Benchmarking of Canadian Power Distributors. Ontario Energy Board. 2007-2009.
153. Research and Testimony on Revenue Decoupling for 3 US Electric Utilities. Hawaiian Electric, 2008-2009.
154. Benchmarking Research and Testimony for a Midwestern Electric Utility. Oklahoma Gas & Electric, 2009.
155. Consultation and Testimony on Revenue Decoupling for a New England DSM Advisory Council. Rhode Island Energy Efficiency and Resource Management Council, 2009.
156. Research and Testimony in Support of a Forward Test Year Rate Filing by a Vertically Integrated Western Electric Utility. Xcel Energy, 2009.
157. Research and Report on the Importance of Forward Test Years for U.S. Electric Utilities. Edison Electric Institute, 2009-2010.
158. Research and Testimony on Atrég for Western Gas and Electric Utilities Operating under Decoupling. San Diego Gas & Electric and Southern California Gas, 2009-2010.
159. Research and Report on PBR Designed to Incent Long Term Performance Gains. Client Name Withheld, 2009-2010.
160. Research and Report on Revenue Decoupling for Ontario Gas and Electric Utilities. Ontario Energy Board, 2009-2010.
161. Research and Report on the Performance of a Western Electric Utility. Portland General Electric, 2009-2010.
162. Research and Report on the Effectiveness of Decoupling for a Western Gas Distributor. Client Name Withheld, 2009-2010.
163. White Paper on Alternative Regulation Precedents for Electric Utilities. Client Name Withheld. 2010-2011.
164. Statistical Cost Benchmarking for a Midwestern Electric Utility, Oklahoma Gas & Electric, 2010.
165. Research and Testimony in Support of a Forward Test Year Rate Filing by a Western Gas Distributor. Xcel Energy, 2010.
166. Research and Testimony in Support of Revenue Decoupling for a Power Distributor. Commonwealth Edison, 2010-2011.
167. Research and Report on the Design of an Incentivized Formula Rate for a Canadian Gas Distributor. Gaz Metro Task Force. 2010-2011.
168. White Paper on Alternative Regulation Precedents for Electric Utilities. Edison Electric Institute. 2010-2011.
169. Benchmarking Research and Report on the Performance of a Midwestern Electric Utility, Oklahoma Gas & Electric, 2011.
170. Research and Testimony on Approaches to Reduce Regulatory Lag for a Northeastern Power Distributor, Potomac Electric Power. 2011.

171. Assistance with an Alternative Regulation Settlement Conference for a Northeastern Power Distributor, Delmarva Power & Light. 2011.
172. 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.
173. Research and Testimony on Remedies for Regulatory Lag for 2 Northeastern Power Distributors, Atlantic City Electric & Delmarva Power & Light. 2011-2012.
174. Research and Testimony on Projected Attrition for a Western Electric Utility, Avista. 2011-2012.
175. Productivity and Plan Design Research and Testimony in Support of a PBR plan for Canadian Gas Distributor, Gaz Metro. 2012-2013.
176. Testimony for US Coal Shippers on the Treatment of Cross Traffic in US Surface Transportation Board Stand Alone Cost Tests. 2012
177. Survey of Gas and Electric Altreg Precedents. Edison Electric Institute. 2012-2013.
178. Research and Testimony on the Design of an Attrition Relief Mechanism for a Northeast Electric Utility, Central Maine Power. 2013.
179. Research and Testimony on Issues in PBR Plan Implementation for a Canadian Consumer Group, Consumers' Coalition of Alberta. 2013.
180. Consultation on an Altreg Strategy for a Southeast Electric Utility (client name withheld). 2013.
181. Consultation on an Altreg Strategy for a Midwestern Electric Utility, Oklahoma Gas & Electric. 2013.
182. Research and Testimony on the Design of an Attrition Relief Mechanism for a Northeast U.S. Electric Utility, Fitchburg Gas & Electric. 2013.
183. Consultation on Regulatory Strategy for a California Electric and Gas Utility, San Diego Gas & Electric. 2013.
184. Research on Drivers of O&M expenses for a Canadian Gas Utility, Gaz Metro. 2013.
185. Research on the Design of Multiyear Rate Plans for a Midwest Electric & Gas Distributor, (client name withheld). 2013-2014.
186. Research on the Design of Multiyear Rate Plans for a Southeast Electric Utility, (client name withheld). 2013-2014.
187. Research and Testimony on Productivity Trends of Gas and Electric Power Distributors for a Canadian Consumer Group, Commercial Energy Consumers of BC, 2013-2014.
188. Research and Testimony on Productivity Trends of Vertically Integrated Electric Utilities, Client Name Withheld, 2014.
189. Research and Testimony on Statistical Benchmarking and O&M Expense Escalation for a Western Electric Utility, PS Colorado, 2014.
190. Transnational Benchmarking of Power Distributor O&M Expenses, Australian Energy Regulator, 2014.
191. Research and Testimony on Statistical Benchmarking and O&M Cost Escalation for an Ontario Power Distributor, Oshawa PUC Networks, 2014-2015.
192. Assessment of Statistical Benchmarking for three Australian Power Distributors, Networks New South Wales, 2014-2015.
193. Research and Testimony on Merger of Two Midwestern Utility Holding Companies, Great Lakes Utilities, 2014-2015.
194. White Paper on Performance-Based Regulation for a Midwest Electric Utility, Xcel Energy, 2015.
195. Research and Support in the Development of Regulatory Frameworks for the Utility of the Future, Powering Tomorrow, 2015.
196. Survey of Gas and Electric Alternative Regulation Precedents. Edison Electric Institute, 2015.
197. White Paper on Multiyear Rate Plans for US Electric Utilities, Edison Electric Institute and a consortium of US electric utilities, 2015.
198. White Paper on Performance-Based Regulation in a High Distributed Energy Resources Future, Lawrence Berkeley National Laboratory, January 2016.
199. White Paper on Performance Metrics for the Utility of the Future, Edison Electric Institute and a consortium of US electric utilities, 2016.
200. Testimony on Revenue Decoupling for Pennsylvania Energy Distributors, National Resources Defense Council, March 2016.

201. Research and Testimony on Multiyear Rate Plan Design and U.S. Power Distribution Productivity Trends, Consumers' Coalition of Alberta. 2016.
202. Development of a Revenue Decoupling Mechanism and Supporting Testimony for a Midwestern U.S. Environmental Advocate, Fresh Energy. 2016.
203. Research and Testimony on Hydroelectric Generation Total Factor Productivity and Multiyear Rate Plan for a Canadian Regulator, Ontario Energy Board. 2016.
204. White Paper on Utility Experience and Lessons Learned from Performance-Based Regulation Plans, Lawrence Berkeley National Laboratory, 2016-2017.
205. Workshop on Performance-Based Regulation for Regulators in Vermont, 2016.
206. Consultation on Alternative Regulation trends for a Vertically Integrated Utility, 2016.
207. Statistical Benchmarking and Multiyear Rate Plan Testimony for a Western Gas Utility, Public Service of Colorado, 2017.
208. Transnational Benchmarking of Power Distribution Cost, Productivity and Rates for the Consumer Advocate of a Canadian province, Alberta Utilities Consumer Advocate, 2017-2018.
209. Presentation on PBR and Distribution System Planning for a U.S. Government Workshop, Lawrence Berkeley National Laboratory, 2017.
210. Statistical Benchmarking and Multiyear Rate Plan Testimony for a Western Electric Utility, Public Service of Colorado, 2017-2018.
211. Development of a Multiyear Rate Plan for a Northeastern Power Distributor, Green Mountain Power, 2017.
212. Productivity Research and Report for a Northeastern Power Distributor, Green Mountain Power, 2017.
213. White Paper on Multiyear Rate Plans and U.S. Power Distributor Productivity Trends, Lawrence Berkeley National Laboratory, 2017.
214. Research and Testimony on Power Distributor Cost Performance and Productivity for a Canadian Regulator, Ontario Energy Board, 2017-2018.
215. Research and Testimony on Gas Utility Productivity for a Canadian Regulator, Ontario Energy Board, 2017-2018.
216. Briefing on Trends in Alternative Regulation, Duke Energy, 2018.
217. Research and Testimony on Performance-Based Regulation for a Midwest Utility, Northern States Power (MN), ongoing.
218. Research and Testimony on Performance-Based Regulation for Power Transmission and Distribution, Association Québécoise des Consommateurs Industriels d'Electricité, ongoing.
219. Research on Granular Power Distributor Cost Benchmarking for a Canadian Regulator, Ontario Energy Board, ongoing.
220. PBR Strategy for a Vertically-Integrated Electric Utility, Hawaiian Electric, ongoing.
221. Research and Testimony on Power Transmitter Productivity and Cost Performance for a Canadian Regulator, Ontario Energy Board, ongoing.
222. Research and Testimony on Power Distributor Cost Benchmarking for a Canadian Regulator, Ontario Energy Board, ongoing.

Publications

1. Public vs. Private Management of Mineral Inventories: A Statement of the Issues. Earth and Mineral Sciences 53, (3) Spring 1984.
2. Review of Energy, Foresight, and Strategy, Thomas Sargent, ed. (Baltimore: Resources for the Future, 1985). Energy Journal 6 (4), 1986.
3. 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).
4. Assessing Metals Demand in Less Developed Countries: Another Look at the Leapfrog Effect. Materials and Society 10 (3), 1986.

5. 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).
6. Pricing and Storage of Field Crops: A Quarterly Model Applied to Soybeans (with junior authors Joseph Glauber, Mario Miranda, and Peter Helmlberger). American Journal of Agricultural Economics 69 (4), November 1987.
7. Storage, Monopoly Power, and Sticky Prices. les Cahiers du CETAI no. 87-03 March 1987.
8. Monopoly Power, Rigid Prices, and the Management of Inventories by Metals Producers. Materials and Society 12 (1) 1988.
9. 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.
10. A Competitive Model of Primary Sector Storage of Refined Oil Products. July 1987, Resources and Energy 10 (2) 1988.
11. Modeling the Convenience Yield from Precautionary Storage: The Case of Distillate Fuel Oil. Energy Economics 10 (4) 1988.
12. Speculative Stocks and Working Stocks. Economic Letters 28 1988.
13. Theory of Pricing and Storage of Field Crops With an Application to Soybeans [with Joseph Glauber (senior author), Mario Miranda, and Peter Helmlberger]. University of Wisconsin-Madison College of Agricultural and Life Sciences Research Report no. R3421, 1988.
14. Competitive Speculative Storage and the Cost of Petroleum Supply. The Energy Journal 10 (1) 1989.
15. 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).
16. 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).
17. Indexed Price Caps for U.S. Electric Utilities. The Electricity Journal, September-October 1991.
18. Gas Supply Cost Incentive Plans for Local Distribution Companies. Proceedings of the Eight NARUC Biennial Regulatory Information Conference (Columbus: National Regulatory Research Institute, 1993).
19. 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).
20. A Price Cap Designers Handbook (with Lawrence Kaufmann). (Washington: Edison Electric Institute, 1995.)
21. The Treatment of Z Factors in Price Cap Plans (with Lawrence Kaufmann), Applied Economics Letters 2 1995.
22. 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.
23. Forecasting the Productivity Growth of Natural Gas Distributors (with Lawrence Kaufmann). AGA Forecasting Review, Vol. 5, March 1996.
24. Branding Electric Utility Products: Analysis and Experience in Regulated Industries (with Lawrence Kaufmann), Washington: Edison Electric Institute, 1997.
25. Price Cap Regulation for Power Distribution (with Larry Kaufmann), Washington: Edison Electric Institute, 1998.
26. Controlling for Cross-Subsidization in Electric Utility Regulation (with Lawrence Kaufmann), Washington: Edison Electric Institute, 1998.
27. The Cost Structure of Power Distribution with Implications for Public Policy (with Lawrence Kaufmann), Washington: Edison Electric Institute 1999.
28. Price Caps for Distribution Service: Do They Make Sense? (with Eric Ackerman and Lawrence Kaufmann), Edison Times, 1999.
29. "Performance-Based Regulation for Energy Utilities (with Lawrence Kaufmann)," Energy Law Journal, Fall 2002.
30. "Performance-Based Regulation and Business Strategy" (with Lawrence Kaufmann), Natural Gas and Electricity, February 2003

31. "Performance-Based Regulation and Energy Utility Business Strategy (With Lawrence Kaufmann), in Natural Gas and Electric Power Industries Analysis 2003, Houston: Financial Communications, Forthcoming.
32. "Performance-Based Regulation Developments for Gas Utilities (with Lawrence Kaufmann), Natural Gas and Electricity, April 2004.
33. "Alternative Regulation, Benchmarking, and Efficient Diversification" (with Lullit Getachew), PEG Working Paper, November 2004.
34. "Econometric Cost Benchmarking of Power Distribution Cost" (with Lullit Getachew and David Hovde), Energy Journal, July 2005.
35. "Assessing Rate Trends of U.S. Electric Utilities", Edison Electric Institute, January 2006.
36. "Alternative Regulation for North American Electric Utilities" (With Lawrence Kaufmann), Electricity Journal, July 2006.
37. "Regulation of Gas Distributors with Declining Use Per Customer" USAEE Dialogue August 2006.
38. "Alternative Regulation for Infrastructure Cost Recovery", Edison Electric Institute, January 2007.
39. "AltReg Rate Designs Address Declining Average Gas Use" (with Lullit Getachew, David Hovde, and Steve Fenrick), Natural Gas and Electricity, 2008.
40. "Price Control Regulation in North America: Role of Indexing and Benchmarking", Electricity Journal, January 2009
41. "Statistical Benchmarking in Utility Regulation: Role, Standards and Methods," (with Lullit Getachew), Energy Policy, 2009.
42. "Alternative Regulation, Benchmarking, and Efficient Diversification", USAEE Dialogue, August 2009.
43. "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.
44. "Econometric TFP Targets, Incentive Regulation and the Ontario Gas Distribution Industry" (With Lullit Getachew), Review of Network Economics, December 2009
45. "Forward Test Years for US Electric Utilities" (With David Hovde, Lullit Getachew, and Matt Makos), Edison Electric Institute, August 2010.
46. "Innovative Regulation: A Survey of Remedies for Regulatory Lag" (With Matt Makos and Gentry Johnson), Edison Electric Institute, April 2011.
47. "Alternative Regulation for Evolving Utility Challenges: An Updated Survey" (With Matthew Makos and Gretchen Waschbusch), Edison Electric Institute, 2013.
48. "Alternative Regulation for Emerging Utility Challenges: 2015 Update" (With Matthew Makos and Gretchen Waschbusch), Edison Electric Institute, November 2015.
49. "Performance-Based Regulation in a High Distributed Energy Resources Future," (With Tim Woolf), Lawrence Berkeley National Laboratory, January 2016.
50. "State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities," (With Jeff Deason), Lawrence Berkeley National Laboratory, July 2017.

Conference Presentations

1. American Institute of Mining Engineering, New Orleans LA, March 1986
2. International Association of Energy Economists, Calgary AL, July 1987
3. American Agricultural Economics Association, Knoxville TN, August 1988
4. Association d'Econometrie Appliqué, Washington DC, October 1988
5. Electric Council of New England, Boston MA, November 1989
6. Electric Power Research Institute, Milwaukee WI, May 1990
7. New York State Energy Office, Saratoga Springs NY, October 1990
8. National Association of Regulatory Utility Commissioners, Columbus OH, September 1992
9. Midwest Gas Association, Aspen, CO, October 1993
10. National Association of Regulatory Utility Commissioners, Williamsburg VA, January 1994
11. National Association of Regulatory Utility Commissioners, Kalispell MT, May 1994
12. Edison Electric Institute, Washington DC, March 1995

13. National Association of Regulatory Utility Commissioners, Orlando FL, March 1995
14. Illinois Commerce Commission, St. Charles IL, June 1995
15. Michigan State University Public Utilities Institute, Williamsburg VA, December 1996
16. Edison Electric Institute, Washington DC, December 1995
17. IBC Conferences, San Francisco CA, April 1996
18. AIC Conferences, Orlando FL, April 1996
19. IBC Conferences, San Antonio TX, June 1996
20. American Gas Association, Arlington VA, July 1996
21. IBC Conferences, Washington DC, October 1996
22. Center for Regulatory Studies, Springfield IL, December 1996
23. Michigan State University Public Utilities Institute, Williamsburg VA, December 1996
24. IBC Conferences, Houston TX, January 1997
25. Michigan State University Public Utilities Institute, Edmonton AL, July 1997
26. American Gas Association, Edison Electric Institute, Advanced Public Utility Accounting School, Irving TX, Sept. 1997
27. American Gas Association, Washington DC [national telecast], September 1997
28. Infocast, Miami Beach FL, Oct. 1997
29. Edison Electric Institute, Arlington VA, March 1998
30. Electric Utility Consultants, Denver CO, April 1998
31. University of Indiana, Indianapolis IN, August 1998
32. Edison Electric Institute, Newport RI, September 1998
33. University of Southern California, Los Angeles CA, April 1999
34. Edison Electric Institute, Indianapolis, IN, August 1999
35. IBC Conferences, Washington, DC, February 2000
36. Center for Business Intelligence, Miami, FL, March 2000
37. Edison Electric Institute, San Antonio TX, April 2000
38. Infocast, Chicago IL, July 2000 [Conference chair]
39. Edison Electric Institute, July 2000
40. IOU-EDA, Brewster MA, July 2000
41. Infocast, Washington DC, October 2000
42. Wisconsin Public Utility Institute, Madison WI, November 2000
43. Infocast, Boston MA, March 2001 [Conference chair]
44. Florida 2000 Commission, Tampa FL, August 2001
45. Infocast, Washington DC, December 2001 [Conference chair]
46. Canadian Gas Association, Toronto ON, March 2002
47. Canadian Electricity Association, Whistler BC, May 2002
48. Canadian Electricity Association, Montreal PQ, September 2002
49. Ontario Energy Association, Toronto ON, November 2002
50. Canadian Gas Association, Toronto ON, February 2003
51. Louisiana Public Service Commission, Baton Rouge LA, February 2003
52. CAMPUT, Banff, ALTA, May 2003
53. Elforsk, Stockholm, Sweden, June 2003
54. Eurelectric, Brussels, Belgium, October 2003
55. CAMPUT, Halifax NS, May 2004
56. Edison Electric Institute, eforum, March 2005
57. EUCI, Seattle, May 2006 [Conference chair]
58. Ontario Energy Board, Toronto ON, June 2006
59. Edison Electric Institute, Madison WI, August 2006
60. EUCI, Arlington VA, September 2006 [Conference chair]
61. EUCI, Arlington VA September 2006
62. Law Seminars, Las Vegas, February 2007
63. Edison Electric Institute, Madison WI, August 2007
64. Edison Electric Institute, national eforum, 2007
65. EUCI, Seattle WA, 2007 [Conference chair]

66. Massachusetts Energy Distribution Companies, Waltham MA, July 2007.
67. Edison Electric Institute, Madison WI, July-August 2007.
68. Institute of Public Utilities, Lansing MI, 2007
69. EUCI, Denver, 2008 [Conference chair]
70. EUCI, Chicago, July 2008 [Conference chair]
71. EUCI, Toronto, March 2008 [Conference chair]
72. Edison Electric Institute, Madison WI, August 2008
73. EUCI, Cambridge MA, March 2009 [Conference chair]
74. Edison Electric Institute, national eforum, May 2009
75. Edison Electric Institute, Madison WI, July 2009
76. EUCI, Cambridge MA, March 2010 [Conference chair]
77. Edison Electric Institute, Madison WI, July 2010
78. EUCI, Toronto, November 2010 [Conference chair]
79. Edison Electric Institute, Madison WI, July 2011
80. EUCI, Philadelphia PA, November 2011 [Conference chair]
81. SURFA, Washington DC, April 2012
82. Edison Electric Institute, Madison WI, July 2012
83. EUCI, Chicago IL, November 2012 [Conference chair]
84. Law Seminars, Las Vegas NV, March 2013
85. Edison Electric Institute Washington DC, April 2013
86. Edison Electric Institute, Washington DC, May 2013
87. Edison Electric Institute, Madison WI, July 2013
88. National Regulatory Research Institute, Teleseminar, August 2013
89. EUCI, Chicago IL April 2014 [Conference chair]
90. Edison Electric Institute, Madison WI, July 2014
91. Financial Research Institute, Columbia MO, September 2014
92. Great Plains Institute, St. Paul MN, September 2014
93. Law Seminars, Las Vegas NV, March 2015
94. Edison Electric Institute, Madison WI, July 2015
95. Lawrence Berkeley National Laboratory, Vermont Future of Electric Utility Regulation Workshop
January 2016
96. Great Plains Institute, Minneapolis MN, February 2016
97. Wisconsin Public Service Commission, Madison WI, March 2016
98. Society of Utility Regulatory Financial Analysts (SURFA), Indianapolis IN, April 2016
99. Edison Electric Institute, Madison WI, July 2016
100. Lawrence Berkeley National Laboratory, Webinar, November 2016
101. Washington State House of Representatives, Technology and Economic Development Committee,
January 2017
102. National Regulatory Research Institute, Webinar, May 2017
103. National Conference of Regulatory Attorneys, Portland OR, May 2017
104. Edison Electric Institute, Madison WI, July 2017
105. Lawrence Berkeley National Laboratory, Webinar, August 2017
106. New England Conference of Public Utilities Commissioners, Hallowell ME, September 2017
107. Wisconsin Public Utilities Institute, Madison WI, October 2017
108. University of Wisconsin Department of Applied Economics, October 2017
109. NARUC, St Paul MN, January 2018
110. Hawaii Public Utilities Commission, Honolulu, HI, July 2018
111. Financial Research Institute, Columbia MO, September 2018
112. Wisconsin Public Utilities Institute, Madison WI, October 2018
113. Hawaii Public Utilities Commission, Honolulu, HI, November 2018

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