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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 Labor and Other Input Price Forecasts for a Rate Case and Multiyear Rate Plan, Puget Sound Energy, ongoing.
2. Survey of Gas and Electric Alternative Regulation Precedents, Edison Electric Institute, ongoing.
3. Research on the Design of Targeted Performance Incentive Mechanisms for a Vertically-Integrated US Electric Utility, Duke Energy, 2023.
4. IR Plan Design, Power Distributor Productivity, and Power and Gas Distributor Benchmarking Research and Testimony for an Alberta Intervenor, Consumers' Coalition of Alberta, 2022-2023.
5. Consultation on Multiyear Rate Plans for a Vertically-Integrated US Electric Utility, Public Service of New Mexico, 2022.
6. Assistance with a White Paper on IR. National Conference of State Legislatures, 2022.
7. Research and Testimony on Targeted Performance Incentive Mechanisms for a Vertically-Integrated US Electric Utility and Gas Distributor, Puget Sound Energy, 2021-2022.
8. 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.
9. Testimony on Multiyear Rate Plan Ratemaking Rules for a Vertically-Integrated Electric Utility, Duke Energy, 2021-2022.
10. Research and Testimony on Power Transmission and Distribution Productivity, Benchmarking, and IR Plan Design, Ontario Energy Board, 2021-2022.
11. Benchmarking of Granular Power Distributor Costs for a Canadian Regulator, Ontario Energy Board, 2018-2021.
12. Consultation and Report on Performance-Based Ratemaking for a Vertically-Integrated Electric Utility, Public Service of New Mexico, 2021-2022.
13. Research and Testimony on Power Transmission Productivity and Cost Benchmarking, Association Québécoise des Consommateurs Industriels d'Electricité, 2020-2021.

14. White Paper and Workshop on IR for a Vertically-Integrated Electric Utility, British Columbia Utilities Commission 2020-2021.
15. Research and Testimony on Productivity and IR Plan Design for a Vertically-Integrated Electric Utility, Hawaiian Electric, 2018-2020.
16. Research and Testimony on Power Distributor Cost Benchmarking and IR Plan Design, Ontario Energy Board, 2020.
17. Research and Testimony on Gas Distributor Productivity, Cost Benchmarking, and IR Plan Design, Massachusetts Attorney General's Office, 2020.
18. Research and Testimony on Power Transmitter Productivity, Cost Benchmarking, and IR Plan Design, Ontario Energy Board, 2019.
19. Research and Testimony on Power Transmitter Productivity, Cost Benchmarking, and IR Plan Design, Ontario Energy Board, 2018-2019.
20. Testimony on IR for Power Transmission and Distribution Utilities, Association Québécoise des Consommateurs Industriels d'Electricité, 2017-2019.
21. Research and Testimony on Power Distributor Productivity, Massachusetts Attorney General's Office, 2019.
22. Research and Testimony on Power Distributor Cost Benchmarking and IR Plan Design for a Canadian Regulator, Ontario Energy Board, 2018-2019.
23. Briefing on Trends in Alternative Regulation, Duke Energy, 2018.
24. Testimony on IR for a Vertically-Integrated Electric Utility, Northern States Power (MN), 2017.
25. Research and Testimony on Gas Utility Productivity for a Canadian Regulator, Ontario Energy Board, 2017-2018.
26. Research and Testimony on Power Distributor Productivity, Cost Performance and IR Plan Design for a Canadian Regulator, Ontario Energy Board, 2017-2018.
27. White Paper on Multiyear Rate Plans and U.S. Power Distributor Productivity Trends, Lawrence Berkeley National Laboratory, 2017.
28. Benchmarking Study and Aftreg Consultation for a Northeastern Power Distributor, Green Mountain Power, 2017.
29. Statistical Benchmarking and Multiyear Rate Plan Research and Testimony for a Western Electric Utility, Public Service of Colorado, 2017-2018.
30. Presentation on IR and Distribution System Planning for a U.S. Government Workshop, Lawrence Berkeley National Laboratory, 2017.
31. Transnational Benchmarking of Power Distribution Cost, Productivity and Rates for a Canadian Consumer Group, Alberta Utilities Consumer Advocate, 2017-2018.
32. Statistical Benchmarking and Multiyear Rate Plan Research and Testimony for a Western Gas Utility, Public Service of Colorado, 2017.
33. Consultation on Aftreg Trends for a Vertically Electric Integrated Utility, Duke Energy, 2016.
34. Workshop on IR for Regulators in Vermont, Lawrence Berkeley National Laboratory, 2016.
35. Research and Testimony on Hydroelectric Generation and Multiyear Rate Plan for a Canadian Regulator, Ontario Energy Board, 2016.
36. Development of a Revenue Decoupling Mechanism and Supporting Testimony for a Midwestern U.S. Environmental Advocate, Fresh Energy, 2016.
37. Research and Testimony on Multiyear Rate Plan Design and U.S. Power Distribution Productivity Trends, Consumers' Coalition of Alberta, 2016.

38. Testimony on Revenue Decoupling for Pennsylvania Energy Distributors, National Resources Defense Council, March 2016.
39. White Paper on Performance Metrics for the Utility of the Future, Edison Electric Institute and a consortium of U.S. electric utilities, 2016.
40. White Paper on IR for Electric Utilities in a High Distributed Energy Resources Future, Lawrence Berkeley National Laboratory, January 2016.
41. White Paper on Multiyear Rate Plans for U.S. Electric Utilities, Edison Electric Institute and a consortium of U.S. electric utilities, 2015.
42. Survey of Gas and Electric Alternative Regulation Precedents, Edison Electric Institute, 2015.
43. Research and Development of Regulatory Frameworks for the Utility of the Future, Powering Tomorrow, 2015.
44. White Paper on IR for a Vertically-Integrated Electric Utility, Xcel Energy, 2015.
45. Research and Testimony on Merger of Two Energy Utility Holding Companies, Great Lakes Utilities, 2014-2015.
46. Assessment of Statistical Benchmarking for Three Australian Power Distributors, Networks New South Wales, 2014-2015.
47. Research and Testimony on Statistical Benchmarking and O&M Cost Escalation for an Ontario Power Distributor, Oshawa PUC Networks, 2014-2015.
48. Transnational Benchmarking of Power Distributor O&M Expenses, Australian Energy Regulator, 2014.
49. Research and Testimony on Statistical Benchmarking and O&M Expense Escalation for a Western Electric Utility, PS Colorado, 2014.
50. Research and Testimony on Productivity Trends of Vertically Integrated Electric Utilities, Client Name Withheld, 2014.
51. Research and Testimony on Productivity Trends of Gas and Electric Power Distributors for a Canadian Consumer Group, Commercial Energy Consumers of BC, 2013-2014.
52. Research on the Design of Multiyear Rate Plans for a Southeast Electric Utility, (client name withheld). 2013-2014.
53. Research on the Design of Multiyear Rate Plans for a Midwest Electric & Gas Distributor, (client name withheld). 2013-2014.
54. Research on Drivers of O&M expenses for a Canadian Gas Utility, Gaz Metro. 2013.
55. Consultation on Regulatory Strategy for a California Electric and Gas Utility, San Diego Gas & Electric. 2013.
56. Research and Testimony on the Design of an Attrition Relief Mechanism for a Northeast U.S. Electric Utility, Fitchburg Gas & Electric. 2013.
57. Consultation on an Altreg Strategy for a Midwestern Electric Utility, Oklahoma Gas & Electric. 2013.
58. Consultation on an Altreg Strategy for a Southeast Electric Utility (client name withheld). 2013.
59. Research and Testimony on Issues in IR Plan Implementation for a Canadian Consumer Group, Consumers' Coalition of Alberta. 2013.
60. Research and Testimony on the Design of an Attrition Relief Mechanism for a Northeast Electric Utility, Central Maine Power. 2013.
61. Survey of Gas and Electric Altreg Precedents. Edison Electric Institute. 2012-2013.
62. Testimony for US Coal Shippers on the Treatment of Cross Traffic in US Surface Transportation Board Stand Alone Cost Tests. 2012
63. Productivity and Plan Design Research and Testimony in Support of a IR plan for Canadian Gas Distributor, Gaz Metro. 2012-2013.

64. Research and Testimony on Projected Attrition for a Western Electric Utility, Avista. 2011-2012.
65. Research and Testimony on Remedies for Regulatory Lag for 2 Northeastern Power Distributors, Atlantic City Electric & Delmarva Power & Light. 2011-2012.
66. 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.
67. Assistance with an Alternative Regulation Settlement Conference for a Northeastern Power Distributor, Delmarva Power & Light. 2011.
68. Research and Testimony on Approaches to Reduce Regulatory Lag for a Northeastern Power Distributor, Potomac Electric Power. 2011.
69. Benchmarking Research and Report on the Performance of a Midwestern Electric Utility, Oklahoma Gas & Electric, 2011.
70. White Paper on Alternative Regulation Precedents for Electric Utilities. Edison Electric Institute. 2010-2011.
71. Research and Report on the Design of an Incentivized Formula Rate for a Canadian Gas Distributor. Gaz Metro Task Force. 2010-2011.
72. Research and Testimony in Support of Revenue Decoupling for a Power Distributor. Commonwealth Edison, 2010-2011.
73. Research and Testimony in Support of a Forward Test Year Rate Filing by a Western Gas Distributor. Xcel Energy, 2010.
74. Statistical Cost Benchmarking for a Midwestern Electric Utility, Oklahoma Gas & Electric, 2010.
75. White Paper on Alternative Regulation Precedents for Electric Utilities. Client Name Withheld. 2010-2011.
76. Research and Report on the Effectiveness of Decoupling for a Western Gas Distributor. Client Name Withheld, 2009-2010.
77. Research and Report on the Performance of a Western Electric Utility. Portland General Electric, 2009-2010.
78. Research and Report on Revenue Decoupling for Ontario Gas and Electric Utilities. Ontario Energy Board, 2009-2010.
79. Research and Report on IR Designed to Incent Long Term Performance Gains. Client Name Withheld, 2009-2010.
80. Research and Testimony on IR for Western Gas and Electric Utilities Operating under Decoupling. San Diego Gas & Electric and Southern California Gas, 2009-2010.
81. Research and Report on the Importance of Forward Test Years for U.S. Electric Utilities. Edison Electric Institute, 2009-2010.
82. Research and Testimony in Support of a Forward Test Year Rate Filing by a Vertically Integrated Western Electric Utility. Xcel Energy, 2009.
83. Consultation and Testimony on Revenue Decoupling for a New England DSM Advisory Council. Rhode Island Energy Efficiency and Resource Management Council, 2009.
84. Benchmarking Research and Testimony for a Midwestern Electric Utility. Oklahoma Gas & Electric, 2009.
85. Research and Testimony on Revenue Decoupling for 3 US Electric Utilities. Hawaiian Electric, 2008-2009.
86. Statistical Cost Benchmarking of Canadian Power Distributors. Ontario Energy Board. 2007-2009.
87. White Paper: Use of Statistical Benchmarking in Regulation. Canadian Electricity Association. 2005-2009.

88. Research and Draft Testimony in Support of a Revenue Decoupling Mechanism for a Large Midwestern Gas Utility. NICOR Gas, 2008.
89. Consultation on Alternative Regulation for a Midwestern Electric Utility. Xcel Energy. 2008.
90. Research and Testimony in Support of a Revenue Adjustment Mechanism for Central Vermont Public Service. 2008.
91. Testimony on Tax Issues for a Canadian Regulator. Ontario Energy Board. 2008.
92. Gas Distribution Productivity Research and Testimony in Support of Decoupling and Other IR Plans for a Canadian Regulator. Ontario Energy Board. 2007.
93. Consultation on Revenue Decoupling and Revenue Adjustment Mechanisms for a Consortium of Massachusetts Electric and Gas Utilities. National Grid. 2007.
94. Consultation on Alternative Regulation for a Western Electric & Gas Distributor Operating under Decoupling. Pacific Gas & Electric. 2007.
95. Report and Testimony on Role of Power Distribution Benchmarking in Regulation. Fortis Alberta, 2006.
96. Productivity Research and Testimony on IR Plan for Central Maine Power, 2007.
97. Consultation on a Canadian Trade Association's Benchmarking Program. Canadian Electricity Association. 2007.
98. Consultation on a IR Strategy for Power Transmission. BC Transmission. 2006.
99. White Paper on Power Distribution Benchmarking for a Canadian Trade Association. Canadian Electricity Association. 2006.
100. Workshop on Alternative Regulation of Major Plant Additions. EEI. 2006.
101. Statistical Benchmarking of A&G Expenses. Michigan Public Service Commission. 2006.
102. Consultation on Price Cap Regulation for Provincial Power Distributors. Ontario Energy Board. 2006.
103. White Paper on Alternative Regulation for Major Plant Additions for a U.S. Trade Association. EEI. 2006.
104. Research and Testimony on the Cost Performance of a New England Power Distributor, Central Vermont Public Service, 2006.
105. Benchmarking and Productivity Research and Testimony for Western Gas and Electric Utilities Operating under Decoupling. San Diego Gas & Electric and Southern California Gas. 2006.
106. Power Distribution Benchmarking Research and Testimony. Central Vermont Public Service. 2006.
107. Power Transmission IR and Benchmarking Support and Testimony. Trans-Energie. 2005.
108. Explaining Recent Rate Requests of U.S. Electric Utilities: Results from Input Price and Productivity Research. Edison Electric Institute. 2005.
109. Statistical Benchmarking of a California Nuclear Plant. San Diego Gas & Electric. 2005.
110. Statistical Benchmarking for a Southeastern U.S. Bundled Power Service Utility. Progress Energy Florida. 2005.
111. Testimony on Statistical Benchmarking of Power Distribution. Hydro One Networks. 2005.
112. Statistical Benchmarking of O&M Expenses for an Australian Power Distributor. SPI Networks. 2004.
113. Research on the Cost Performance of Three English Power Distributors, EDF, 2004.
114. Power Transmission and Distribution IR and Benchmarking Research for a Canadian Utility. Hydro One Networks, 2001-2003.
115. Indexation of O&M Expenses for an Australian Power Distributor. SPI Networks. 2004.
116. Benchmarking Testimony for Three Ontario Power Distributors. Hydro One, Toronto Hydro, and Enersource Hydro Mississauga. 2004.

117. Statistical Benchmarking Research for Three British Power Distributors. EDF Eastern, EDF London, and EDF Seeboard. 2004.
118. Statistical Benchmarking Research for a British Power Distributor. United Utilities. 2004.
119. White Paper on Unbundled Storage and the Chicago Gas Market for a Midwestern Gas Distributor. Nicor Gas. 2004.
120. Advice on Benchmarking Strategy for a Canadian Trade Association. Canadian Electricity Association. 2004.
121. Workshop on Service Quality Regulation for Regulators. Canadian Electricity Association. 2004.
122. Advice on Productivity for Two British Power Distributors. Northern Electric and Yorkshire Electricity Distribution. 2004.
123. Research and Testimony on Power and Natural Gas Distribution Productivity and Benchmarking for a U.S. Utility Operating under Decoupling. Sempra Energy. 2004.
124. Research and Advice on IR for a Western Gas Distributor. Questar Gas. 2004.
125. Research, Testimony, and Settlement Support on the Cost Efficiency of O&M Expenses for a Canadian Gas Distributor. Enbridge Gas Distribution. 2004.
126. Testimony on Distributor Cost Benchmarking. Hydro One Networks. 2004.
127. Advice on Statistical Benchmarking for Two British Power Distributors. Northern Electric and Yorkshire Electricity Distribution, 2003.
128. Statistical Benchmarking, Productivity, and Incentive Power Research for a Combined Gas and Electric Company. Baltimore Gas and Electric, 2003.
129. Statistical Benchmarking of Power Transmission. Central Research Institute for the Electric Power Industry (Japan), 2003.
130. Statistical Benchmarking and IR Plan for Four Bolivian Power Distributors. Superintendencia de Electricidad, 2003.
131. General consultation on IR Initiative. Union Gas, 2003.
132. Workshop on IR for Canadian Regulators. Canadian Electricity Association, 2003.
133. Advice on Performance Goals for a U.S. Transmission Company. American Transmission, 2003.
134. Research, Testimony, and Settlement Support on the Cost Efficiency of O&M Expenses. Enbridge Gas Distribution, 2003.
135. Workshop on IR for Louisiana's Public Service Commission. Entergy Services, February 2003.
136. Workshop on Recent Trends in IR. Entergy Services, 2003.
137. Research on the Incentive Power of Alternative Regulatory Systems. Hydro One Networks, 2002.
138. Future of T&D Regulation, Southern California Edison. October 2002.
139. Benchmarking and Productivity Research and Testimony for a Western Gas and Electric Power Distributor operating under Decoupling. Sempra Energy, 2002.
140. Research on Power Distribution Productivity and Inflation Trends. NSTAR, 2002.
141. Research and Testimony on Benchmarking for Bundled Power Service. AmerenUE, 2002.
142. Statistical Benchmarking for Electric Power Transmission. Transend, 2002.
143. Statistical Benchmarking for three Australian Gas Utilities. Client name confidential, 2001.
144. Research and Testimony on Productivity and IR Plan Design for a Power Distributor. Bangor Hydro Electric, 2001.
145. Competition Policy in the Power Market of Western Australia, Western Power, 2001.
146. IR Presentation to Governor Bush Energy 2000 Commission. Edison Electric Institute, 2001.
147. Productivity Research and IR Plan Design. Hydro One Networks, 2001.

148. Statistical Benchmarking for Power Distribution, Queensland Competition Authority, 2001.
149. E-Forum on IR for Power Procurement. Edison Electric Institute, 2001.
150. Research on TFP and Benchmarking for Gas and Electric Power Distribution. Sempra Energy, 2000.
151. IR Plan Design for a Natural Gas Distributor Operating under Decoupling. BC Gas, 2000.
152. Research on the Cost Performance of a New England Power Distributor. Central Maine Power, 2000.
153. Power and Natural Gas Procurement IR. Western Resources, 2000.
154. Service Quality IR Plan Design and Testimony. Gas and electric power distributors of Massachusetts, 2000.
155. Research and Testimony on Economies of Scale in Local Power Delivery, Metering, and Billing. Electric distributors of Massachusetts, 2000.
156. Economies of Scale and Scope in an Isolated Electric System. Western Power, 2000.
157. Workshop on IR for Gas and Electric Distribution. Public Service Electric and Gas, 2000.
158. Testimony on IR for Power Distribution. TXU Electric, 2000.
159. Statistical Benchmarking for Power Transmission. Powerlink Queensland, 2000.
160. Critique of a Commission-Sponsored Benchmarking Study. CitiPower, Powercor, and United Energy, 2000.
161. Unit Cost of Power Distribution. AGL, 2000.
162. Statistical Benchmarking for Bundled Power Services. Niagara Mohawk Power, 1999.
163. Cost Benchmarking for Power Distribution. United Energy, 1999.
164. Cost Benchmarking for Power Distribution. Powercor, 1999.
165. Cost Benchmarking for Power Distribution. CitiPower, 1999.
166. Cost Benchmarking for Power Transmission and Distribution. Southern California Edison, 1999.
167. Research and Testimony on Benchmarking and IR Plan Design for Bundled Power Service. Oklahoma Gas & Electric, 1999.
168. Advice on IR and Affiliate Relations. Western Resources, 1999.
169. Advice on Code of Conduct Issues for a Western Electric Utility. Public Service of Colorado, 1999.
170. Workshop on IR for Energy Utilities. World Bank, 1998
171. Design of a Stranded Benefit Passthrough Mechanism for a Restructuring Electric Utility. Niagara Mohawk Power, 1998.
172. Testimony on Functional Separation of Power Generation and Delivery in Illinois. Edison Electric Institute, 1998.
173. Statistical Benchmarking for Power Distribution. Victorian distribution business, 1998-9.
174. IR Plan Design, Statistical Benchmarking, and Supporting Testimony. Kentucky Utilities & Louisville Gas & Electric, 1998-99.
175. Research and Testimony on Productivity and IR Plan Design for Bundled Power Service. Hawaiian Electric and Hawaiian Electric Light & Maui Electric, 1998-99.
176. Research and Testimony on Economies of Scale in Power Supply. Hawaiian Electric Company, 1998.
177. Testimony on Brand Names. Edison Electric Institute, 1998.
178. Cross-Subsidization Measures for Restructuring Electric Utilities. Edison Electric Institute, 1998.
179. Cost Structure of Power Distribution. Edison Electric Institute, 1998.
180. Research and Testimony on Gas and Electric Power Distribution Productivity. San Diego Gas & Electric, 1997-98.

181. White Paper and Public Appearances on IR Options for Power Distributors in Australia. Distribution companies of Victoria, 1997-98.
182. White Paper on Price Cap Regulation (including Service Quality) for Power Distribution. Edison Electric Institute, 1997-99.
183. Productivity, Benchmarking, and IR Plan Design Research and Testimony for a Gas Distributor. Atlanta Gas Light, 1997.
184. Inflation and Productivity Trends of U.S. Power Distributors. Niagara Mohawk Power, 1997.
185. Statistical Benchmarking and Stranded Cost Recovery. Edison Electric Institute, 1997.
186. Review of a Power Purchase Contract Dispute. City of St. Cloud, MN, 1997.
187. Statistical Benchmarking for Bundled Power Service and Testimony. Pacific Gas & Electric, 1997.
188. Generation and Power Transmission IR for a Restructuring Canadian Electric Utility, EPCOR, 1997.
189. White Paper on Utility Brand Name Policy. Edison Electric Institute, 1997.
190. Price Cap Plan Design for Power Distribution Services. Comisión de Regulación de Energía y Gas (Colombia), 1997.
191. Productivity and IR Plan Design Research and Testimony for a Gas Distributor under Decoupling. BC Gas, 1997.
192. Presentation on Performance-Based Regulation for a Natural Gas Distributor, Northwestern Utilities, 1996.
193. Statistical Benchmarking for Bundled Power Service. Pennsylvania Power & Light, 1996.
194. Design of Geographic Zones for Privatized Natural Gas Distributors. Comision Reguladora de Energia (Mexico), 1996.
195. IR Plan Design for Bundled Power Services. Hawaiian Electric, 1996
196. Testimony on IR for Power Distribution. Commonwealth Energy System, 1996.
197. Power Distribution Benchmarking for a PJM Utility. Delmarva Power, 1996.
198. Consultation on the Design and Implementation of Price Cap Plans for Natural Gas Production, Transmission, and Distribution. Comision Reguladora de Energia (Mexico), 1996.
199. Productivity and Benchmarking Research and Testimony for a Natural Gas Distributor. Boston Gas, 1996.
200. Stranded Cost Recovery and Power Distribution IR for a Restructuring U.S. Electric Utility. Delmarva Power, 1996.
201. Development of a Price Cap Plan for a Midwest Gas Distributor. Illinois Power, 1996.
202. Speech on IR for Electric Utilities. Hawaiian Electric, 1995.
203. Productivity Research and Testimony for a Natural Gas Distributor. NMGas, 1995.
204. Productivity and IR Plan Design Research and Testimony for a Natural Gas Distributor Operating under Decoupling. Southern California Gas, 1995.
205. Regulatory Strategy for a Restructuring Northeast Electric Utility. Niagara Mohawk Power, 1995.
206. Incentive Regulation Support for a Japanese Electric Utility. Tokyo Electric Power, 1995.
207. Regulatory Strategy for a Restructuring Canadian Electric Utility. Alberta Power, 1995.
208. Productivity Research and IR Plan Design for Bundled Power Service and Gas Distribution. Public Service Electric & Gas, 1995.
209. White Paper on Performance-Based Regulation. Electric Power Research Institute, 1995.
210. Statistical Benchmarking for Bundled Power Services and Testimony. Southern California Edison, 1994.
211. White Paper on Price Cap Regulation For Electric Utilities. Edison Electric Institute, 1994.

212. Productivity Research for a Natural Gas Distributor, Southern California Gas, 1994.
213. Productivity and IR Plan Design Research and Testimony. Central Maine Power, 1994.
214. Review of the Southwest Gas Transportation Market. Arizona Electric Power Cooperative, 1993.
215. Development of IR Options. Southern California Edison, 1993.
216. Productivity and IR Plan Design Research and Testimony. Niagara Mohawk Power, 1993-94.
217. Design and Negotiation of a Comprehensive Benchmark Incentive Plans for Gas Distribution and Bundled Power Service. Niagara Mohawk Power, 1992.
218. Gas Transportation Strategy for an Arizona Electric Utility. AEPCO, 1992.
219. Gas Supply Cost Indexes for Incentive Regulation. Pacific Gas & Electric, 1992.
220. Benchmarking Gas Supply Services and Testimony. Niagara Mohawk Power, 1992.
221. Efficient Rate Design for Interstate Gas Transporters. AEPCO, 1991.
222. Cost Performance Indexes for Gas and Electric Utilities for Use in IR. Niagara Mohawk Power, 1991.
223. Productivity Growth Estimates for U.S. Gas Distributors and Their Use in IR. Southern California Gas, 1991.
224. Sales Promotion Policies of Gas Distributors. Northern States Power-Wisconsin, 1991.
225. Economics of Electric Revenue Adjustment Mechanisms. Niagara Mohawk Power, 1991.
226. Workshop on IR for Electric Utilities. Southern Company Services, 1991.
227. Comprehensive Performance Indexes for Electric and Gas Distribution Utilities. Niagara Mohawk Power, 1990-1991.
228. Measurement of Productivity Trends for the U.S. Electric Power Industry. Niagara Mohawk Power, 1990-91.
229. Measuring Productivity Trends in the Local Gas Distribution Industry. Niagara Mohawk Power, 1990.
230. Measuring the Productivity Growth of Gas Transmission Companies. Interstate Natural Gas Association of America, 1990.
231. Incentive Regulation: Can it Pay for Interstate Gas Companies? Southern Natural Gas, 1989.
232. Design of Time-of-Use Rates for Residential Customers. Iowa Power, 1989.
233. Measuring Load Relief from Interruptible Services. New England Electric Power Service, 1989.
234. Customer Response to Interruptible Service Programs. Southern California Edison, 1989.
235. Modeling Customer Response to Curtailable Service Programs. Electric Power Research Institute, 1989.
236. Impact of the Natural Gas Policy Act on U.S. Production and Wellhead Prices. New England Fuel Institute, 1981
237. Competition in the Natural Gas Market of the San Juan Basin. Public Service of New Mexico, 1981.

Publications

1. "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.
2. "PBR and Climate Change" (With Matthew Makos), *Climate and Energy*, Volume 37, Issue 12, July 2021.
3. "Escalating Power Distributor O&M Revenue" (With David Hovde), *Electricity Journal*, Volume 34, Issue 6, July 2021.
4. "Four Common Myths About Performance-based Regulation," *Utility Dive*, April 27, 2021.

5. "Revenue Decoupling at 40, Venerable PBR Tool Goes National," (With Matthew Makos), Public Utilities Fortnightly, April 2021.
6. "State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities," (With Jeff Deason), Lawrence Berkeley National Laboratory, July 2017.
7. "Performance-Based Regulation in a High Distributed Energy Resources Future," (With Tim Woolf), Lawrence Berkeley National Laboratory, January 2016.
8. "Alternative Regulation for Emerging Utility Challenges: 2015 Update" (With Matthew Makos and Gretchen Waschbusch), Edison Electric Institute, November 2015.
9. "Alternative Regulation for Evolving Utility Challenges: An Updated Survey" (With Matthew Makos and Gretchen Waschbusch), Edison Electric Institute, 2013.
10. "Innovative Regulation: A Survey of Remedies for Regulatory Lag" (With Matt Makos and Gentry Johnson), Edison Electric Institute, April 2011.
11. Edison Electric Institute, August 2010.
12. "Econometric TFP Targets, Incentive Regulation and the Ontario Gas Distribution Industry" (With Lullit Getachew), Review of Network Economics, December 2009
13. "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.
14. "Alternative Regulation, Benchmarking, and Efficient Diversification", USAEE Dialogue, August 2009.
15. "Statistical Benchmarking in Utility Regulation: Role, Standards and Methods," (with Lullit Getachew), Energy Policy, 2009.
16. "Price Control Regulation in North America: Role of Indexing and Benchmarking," Electricity Journal, January 2009.
17. "AltReg Rate Designs Address Declining Average Gas Use" (with Lullit Getachew, David Hovde, and Steve Fenrick), Natural Gas and Electricity, 2008.
18. "Alternative Regulation for Infrastructure Cost Recovery", Edison Electric Institute, January 2007.
19. "Regulation of Gas Distributors with Declining Use Per Customer" USAEE Dialogue August 2006.
20. "Alternative Regulation for North American Electric Utilities" (With Lawrence Kaufmann), Electricity Journal, July 2006.
21. "Assessing Rate Trends of U.S. Electric Utilities", Edison Electric Institute, January 2006.
22. "Econometric Cost Benchmarking of Power Distribution Cost" (with Lullit Getachew and David Hovde), Energy Journal, July 2005.
23. "Alternative Regulation, Benchmarking, and Efficient Diversification" (with Lullit Getachew), PEG Working Paper, November 2004.
24. "Performance-Based Regulation Developments for Gas Utilities (with Lawrence Kaufmann), Natural Gas and Electricity, April 2004.
25. "Performance-Based Regulation and Energy Utility Business Strategy (With Lawrence Kaufmann), in Natural Gas and Electric Power Industries Analysis 2003, Houston: Financial Communications, Forthcoming.
26. "Performance-Based Regulation and Business Strategy" (with Lawrence Kaufmann), Natural Gas and Electricity, February 2003
27. "Performance-Based Regulation for Energy Utilities (with Lawrence Kaufmann)," Energy Law Journal, Fall 2002.

28. Price Caps for Distribution Service: Do They Make Sense? (with Eric Ackerman and Lawrence Kaufmann), Edison Times, 1999.
29. The Cost Structure of Power Distribution with Implications for Public Policy (with Lawrence Kaufmann), Washington: Edison Electric Institute 1999.
30. Controlling for Cross-Subsidization in Electric Utility Regulation (with Lawrence Kaufmann), Washington: Edison Electric Institute, 1998.
31. Price Cap Regulation for Power Distribution (with Larry Kaufmann), Washington: Edison Electric Institute, 1998.
32. Branding Electric Utility Products: Analysis and Experience in Regulated Industries (with Lawrence Kaufmann), Washington: Edison Electric Institute, 1997.
33. Forecasting the Productivity Growth of Natural Gas Distributors (with Lawrence Kaufmann). AGA Forecasting Review, Vol. 5, March 1996.
34. 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.
35. The Treatment of Z Factors in Price Cap Plans (with Lawrence Kaufmann), Applied Economics Letters 2 1995.
36. A Price Cap Designers Handbook (with Lawrence Kaufmann). (Washington: Edison Electric Institute, 1995.)
37. 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).
38. Gas Supply Cost Incentive Plans for Local Distribution Companies. Proceedings of the Eight NARUC Biennial Regulatory Information Conference (Columbus: National Regulatory Research Institute, 1993).
39. Indexed Price Caps for U.S. Electric Utilities. The Electricity Journal, September-October 1991.
40. 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).
41. 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).
42. Competitive Speculative Storage and the Cost of Petroleum Supply. The Energy Journal 10 (1) 1989.
43. Theory of Pricing and Storage of Field Crops With an Application to Soybeans [with Joseph Glauber (senior author), Mario Miranda, and Peter Helmlinger]. University of Wisconsin Madison College of Agricultural and Life Sciences Research Report no. R3421, 1988.
44. Speculative Stocks and Working Stocks. Economic Letters 28 1988.
45. Modeling the Convenience Yield from Precautionary Storage: The Case of Distillate Fuel Oil. Energy Economics 10 (4) 1988.
46. A Competitive Model of Primary Sector Storage of Refined Oil Products. July 1987, Resources and Energy 10 (2) 1988.
47. 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.
48. Monopoly Power, Rigid Prices, and the Management of Inventories by Metals Producers. Materials and Society 12 (1) 1988.

49. Storage, Monopoly Power, and Sticky Prices. *les Cahiers du CETAI* no. 87 03 March 1987.
50. 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.
51. 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).
52. Assessing Metals Demand in Less Developed Countries: Another Look at the Leapfrog Effect. *Materials and Society* 10 (3), 1986.
53. 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).
54. Review of Energy, Foresight, and Strategy, Thomas Sargent, ed. (Baltimore: Resources for the Future, 1985). *Energy Journal* 6 (4), 1986.
55. Public vs. Private Management of Mineral Inventories: A Statement of the Issues. *Earth and Mineral Sciences* 53, (3) Spring 1984.

Conference Presentations

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

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

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

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