

Background and Qualifications of Dr. Jay Zarnikau

Jay Zarnikau, PhD

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PROFESSIONAL EXPERIENCE

2017- Sr. Vice President, Frontier Energy

Assumed role of Sr. VP following acquisition of Frontier Associates LLC by Frontier Energy, an affiliate of GTI.

1999-2016 President, Frontier Associates, Austin, Texas

Responsible for providing assistance in the design and implementation of energy efficiency programs, utility resource planning, electricity pricing, rate analysis/design, program evaluation, demand forecasting, and energy policy. Also assists industrial and commercial energy consumers in rate negotiations and energy procurement activities.

1992-1999 Vice President, Planergy, Austin, Texas

Responsible for providing assistance in the design and implementation of energy efficiency programs, and providing consulting assistance in the areas of utility resource planning, electricity pricing, program evaluation, demand forecasting, and energy policy.

1991-1993 Manager of Energy Strategies Research Program, The University of Texas at Austin Center for Energy Studies, Austin, Texas

Held faculty-level research position.

Responsible for the oversight of research projects in the areas of utility resource planning, regulation, electricity pricing, and policy analysis, including assessments of the potential for energy efficiency savings in Texas.

Program Manager for EPRI-sponsored effort to develop a new integrated resource planning framework and model.

1983-1991 Director of Electric Utility Regulation (from 1988 to 1991), Economist (1983 to 1988) Public Utility Commission of Texas, Austin, Texas

Supervised a professional staff of over fifty accountants, economists, and engineers responsible for analyzing regulatory and technical issues and providing recommendations to the Commission. Prepared and defended testimony in over twenty proceedings.

1982-1983 Research Associate, Bureau of Business Research, University of Texas at Austin, Austin, Texas

Assisted in maintenance of statewide economic-demographic forecasting model, prepared projections for state legislature and state agencies, and conducted studies to determine the value of various mineral resources in Texas.

EDUCATION

Ph.D. (1990) and M.A. (1983) in Economics, University of Texas at Austin. Fields completed in Econometrics, Resource Economics, and Micro Modeling

B.S. in Business Administration and Economics, State University of New York, Oswego, NY, May 1981

McGill University, Montreal, Quebec, 1979-1980

PUBLICATIONS

Refereed Journals:

C.K. Woo, A. Shiu, Y. Liu, X.P. Luo, J. Zarnikau. Consumption Effects of an Electricity Decarbonization Policy: Hong Kong. *Energy – the international journal*. 2017.

Liu, Y., Woo, C.K., Zarnikau, J. (2017). Wind generation's effect on the ex post variable profit of compressed air energy storage: Evidence from Texas. *Journal of Energy Storage*. 9, 25-39.

C.K. Woo, J. Zarnikau, R. Li, and A. Shiu. (2016). "Winter residential optional dynamic pricing: British Columbia." *The Energy Journal*. 38:5.

J. Zarnikau, C.K. Woo, Lucy Zhu (2016). "Zonal merit-order effects of wind generation development on day-ahead and real-time electricity market prices in Texas. *Journal of Energy Markets*. " December.

C.K. Woo, J. Moore, B. Schneiderman, T. Ho, A. Olson, L. Alagappan, K. Chawla, N. Toyama, J. Zarnikau. (2016). "Merit-order effects of renewable energy and price divergence in California's day-ahead and real-time electricity markets." *Energy Policy*, 92, 299-312.

Yun Liu, C.K. Woo, J. Zarnikau (2016). "Ex post payoffs of a tolling agreement for natural-gas-fired generation in Texas." *Journal of Energy Markets*, 9(1), 1-25.

- C.K. Woo, I. Horowitz, J. Zarnikau, J. Moore, B. Schneiderman, T. Ho, E. Leung (2016). "What Moves the Ex Post Variable Profit of Natural-Gas-Fired Generation in California?" *The Energy Journal*, 37:3, 29-57.
- J. Zarnikau, C.K. Woo, C. Gillett, T. Ho, S.S. Zhu, and E. Leung. (2014). "Day-ahead forward premiums in the Texas electricity market." *Journal of Energy Markets*.
- C.K. Woo, Yuk Shing Cheng, Agnes Law, J. Zarnikau, Ira Horowitz, Siu Tung Ho, Yin Leung (2015). "Consumer support for a public utilities commission in Hong Kong." *Energy Policy*. 76, 87-97.
- C.K. Woo, Tony Ho, J. Zarnikau, Arne Olson, Ryan Jones, Michele Chait, Ira Horowitz, and Jianhui Wang. (2014). "Electricity market price and nuclear power plant shutdown: Evidence from California." *Energy Policy*. 73, 234-244.
- J. Zarnikau, C.K. Woo, Ross Baldick (2014). "Did the introduction of a nodal market structure impact wholesale electricity prices in the Texas (ERCOT) market?" *Journal of Regulatory Economics*. 45(2), 194-208.
- J. Zarnikau, Shuangshuang Zhu (2014). "The Identification of Peak Period Impacts When a TMY Weather File is Used in Building Energy Use Simulation." *Open Journal of Energy Efficiency*. Vol. 3.
- C.K. Woo, J. Zarnikau, Ira Horowitz, Jonathan Kadish, Jianhui Wang, Arne Olson (2013). "The Impact of Wind Generation on Wholesale Electricity Prices in the Hydro-Rich Pacific Northwest." *IEEE Transactions on Power Systems*, 28:4, 4245-4253.
- J. Zarnikau, D. Thal (2013). "The response of large industrial energy consumers to four coincident peak (4CP) transmission charges in the Texas (ERCOT) market." *Utilities Policy*. 26, 1-6.
- C.K. Woo, J. Zarnikau, Ira Horowitz, and Alice Shiu. (2013). "Transparency of Retail Energy Pricing: Evidence from the U.S. Natural Gas Industry." *Managerial and Decision Economics*. 35:4, 300-308.
- J. Zarnikau (2012). "The Many Factors that Affect the Success of Regulatory Mechanisms Designed to Foster Energy Efficiency," *Energy Efficiency*. 5:3, 393-410.
- C.K. Woo, Ira Horowitz, Brian Horii, Ren Orans, Jay Zarnikau (2012). "Blowing in the Wind: Vanishing Payoffs of a Tolling Agreement for Natural Gas-Fired Generation of Electricity in Texas," *The Energy Journal*, 33(1), 207-229.
- C.K. Woo, J. Zarnikau, J. Moore, I. Horowitz (2011). "Wind Generation and Zonal-Market Price Divergence: Evidence from Texas," *Energy Policy*, 39(7), 3928-3938.
- J. Zarnikau (2011). "Successful Renewable Energy Development in a Competitive Electricity Market: A Texas Case Study," *Energy Policy*, 39:7, 3906-3913.

- Phil Henshaw, Carey King, J. Zarnikau (2011). "System Energy Assessment (SEA), Defining a Standard Measure of EROI for Energy Businesses as Whole Systems." *Sustainability*, 3(10), 1908-1943.
- C.K. Woo, J. Zarnikau, Eli Kollman (2012). "Exact Welfare Effect for Double-Log Demand with Partial Adjustment", *Empirical Economics*, Springer, 42(1), 171-180.
- J. Zarnikau (2010). "Demand Participation in the Restructured Electric Reliability Council of Texas Market," *Energy -- the International Journal*.
- J. Zarnikau, Linhong Kang (2009). "Did the Expiration of Retail Price Caps Affect Competitive Electricity Prices in Texas?," *Energy Policy*, 37(5), 1713-1717.
- J. Zarnikau, Ian Hallett (2008). "Aggregate Consumer Response to Wholesale Prices in the Restructured Texas Electricity Market," *Energy Economics*. 30(4), 1798-1808.
- J. Zarnikau, Greg Landreth, Ian Hallett, Subal Kumbhakar (2007). "Industrial Energy Consumer Response to Wholesale Prices in the Restructured Texas Electricity Market," *Energy -- the International Journal*. 2007.
- J. Zarnikau, Marilyn Fox, Paul Smolen (2007). "Trends in Prices to Commercial Energy Consumers in the Competitive Texas Electricity Market," *Energy Policy*. Vol. 35(8), pp. 4332-4339.
- Ni Xiao, J. Zarnikau, Paul Damien (2007). "Testing Functional Forms in Energy Modeling: An Application of the Bayesian Approach," *Energy Economics*, Vol. 54(2), pp. 158-166.
- J. Zarnikau, Doug Whitworth (2006). "Has Electric Utility Restructuring Led to Lower Electricity Prices for Residential Consumers in Texas?" *Energy Policy*, 34(15), 2191-2200.
- J. Zarnikau (2005). "A Review of Efforts to Restructure Texas' Electricity Market," *Energy Policy*, 33(1), 15-25.
- J. Zarnikau (2003). "Consumer Demand for 'Green Power' and Energy Efficiency," *Energy Policy*, Vol. 31(15), 2003, 1661-1672.
- J. Zarnikau (2003). "Functional Forms in Energy Demand Modeling," *Energy Economics*, Vol. 25(6), pp. 603-613.
- J. Zarnikau (1999). "Defining Total Use in Econometric Studies, Does the Aggregation Approach Matter?," *Energy Economics*, 21(5), 485-492. [http](#)
- J. Zarnikau (1999). "Will Tomorrow's Energy Efficiency Indices Prove Useful in Economic Studies?" *The Energy Journal*, Vol. 20(3).
- J. Zarnikau (1996). "A Re-examination of the Causal Relationship between Energy Consumption and GDP," *Journal of Energy and Development*.

- J. Zarnikau and R. Reilley (1996). "The Evolution of the Cogeneration Market in Texas," *Energy Policy*, Vol. 24(1), 67-79.
- J. Zarnikau, Philip Schmidt, Sid Guermouche (1996) "Can Different Energy Resources be Added or Compared?," *Energy - The International Journal*, 21:6. .
- J. Zarnikau (1994). "Spot Market Pricing of Water Resources and Efficient Means of Rationing Water During Scarcity." *Resource and Energy Economics*. 16(3), 189-210.
- Martin Baughman, Shams Siddiqi, J. Zarnikau (1997). "Advanced Pricing in Electrical Systems: Theory," *IEEE Trans. on Power Systems*, 12:1, 489-495. /
- Martin Baughman, Shams Siddiqi, J. Zarnikau (1997) "Advanced Pricing in Electrical Systems: Applications," *IEEE Trans. on Power Systems*, 12:1, 496-502.
- Martin Baughman, Shams Siddiqi, J. Zarnikau (1995). "Integrating Transmission into IRP: Analytical Approach," 10:3, 1652-1659. *IEEE Trans. on Power Systems*.
<http://ieeexplore.ieee.org/document/466467/>
- Martin Baughman, Shams Siddiqi, J. Zarnikau (1995). "Integrating Transmission into IRP: Case Study Results," *IEEE Trans. on Power Systems*, 10:3, 1660-1666.
- J. Zarnikau (1990). "Customer Responsiveness to Real-Time Pricing of Electricity," *The Energy Journal*, December, Vol. 11, No. 4.
- J. Zarnikau, Martin Baughman, George Mentrup (1990) "Spot Market Pricing of Electricity," *Forum for Applied Research and Public Policy*, Winter, 5, No. 4.

Under Review or Refinement:

- C.K. Woo, Y. Liu, J. Zarnikau, A. Shiu, X.P. Luo. Price elasticities of retail energy demands in the United States: New evidence from a panel of monthly data for 2001 - 2016. (*Applied Energy*)
- C.K. Woo, Y. Chen, J. Zarnikau, A. Olson, J. Moore, T. Ho. The Impact of Carbon Trading on California's Real-Time Electricity Market Prices. (*Energy – the international journal*)

Non-Refereed Journals and Widely-Accessible Proceedings:

- C.K. Woo, J. Zarnikau, Y. Chen, A. Olson, J. Moore, T. Ho, Y. Liu, X. Luo (2018). An Empirical Analysis of California's Hybrid Capacity Option. *The Electricity Journal*, March.
- C.K. Woo, Y. Liu, X.P. Luo, A. Shiu, J. Zarnikau (2017). "Consumption effects of electricity decarbonization: Evidence from California and the Pacific Northwest," *The Electricity Journal*, December.
- C.K. Woo and J. Zarnikau (2017) "A Solar Rate Option for the Development of Behind-the-Meter Photovoltaic Systems," *The Electricity Journal*, 30(3), 1-3.

- C.K. Woo, J. Zarnikau, Raymond Li, Alice Shiu (2016). “kWh Effects of Residential Optional Dynamic Pricing: Winter Evidence from British Columbia, Canada.” *The Electricity Journal*. 29:9, 44-47.
- C.K. Woo, J. Moore, B. Schneiderman, A. Olson, R. Jones, T. Ho, N. Toyama, J. Wang, J. Zarnikau (2015). “Merit-Order Effects of Day-Ahead Wind Generation Forecast in the Hydro-Rich Pacific Northwest.” *The Electricity Journal*. 28:9, 52-62.
- J. Zarnikau, V. Rai (2016). “Retail Competition, Advanced Metering Investments, and Product Differentiation: Evidence from Texas” in *Future of utilities: Utilities of the future: How technological innovations in distributed energy resources will reshape the future of electric power sector*, Ed. F. Sioshansi.
- J. Zarnikau, L. Zhu, R. Russell, M. Holloway, M. Dittmer (2015). “How Will Tomorrow's Residential Energy Consumers Respond to Price Signals? Insights from a Pricing Experiment.” *The Electricity Journal*. August.
- J. Zarnikau, A. Martin, S. Isser (2015). “Energy Efficiency Programs in a Restructured Market: The Texas Framework.” *The Electricity Journal*. March.
- C.K. Woo, J. Zarnikau, Tony Ho, Arne Olson, H.W. Leung, and E. Cutter (2015) “Virtual bidding, wind generation and California’s day-ahead electricity forward premium.” *The Electricity Journal*. 28:1, 29-40.
- J. Zarnikau. “Three Simple Steps to Clip the Peak in the Texas (ERCOT) Electricity Market. USAEE Working Paper No. 13-143.
- J. Zarnikau, Ian Partridge, John Dinning, and Daniel Robles (2013). “Will the SIEPAC Transmission Project Lead to a Vibrant Electricity Market in Central America?,” *Energy Forum*, 4th Quarter.
- J. Zarnikau, Parviz Adib, Ross Baldick (2013). “Texas Electricity Market: Best Gets Better,” in *Evolution of Global Electricity Markets*, ed. Fereidoon Sioshansi, Elsevier.
- J. Zarnikau, Meredith Gray (2010). “Getting to Zero: Green Building and Net Zero Energy Homes,” in *Smart Living in the Coming Age of Scarcity*, edited by F. P. Sioshansi, Elsevier.
- J. Zarnikau, Carey King, Phil Henshaw (2010). “Defining a Standard Measure for Whole System EROI, Combining Economic Top-Down and LCA Bottom-Up Accounting,” *Proceedings of Energy Sustainability 2010*, American Society of Mechanical Engineers, Phoenix, May.
- J. Zarnikau (2009). “The Greening of. . . Texas?,” *International Association for Energy Economics Annual Conference*, San Francisco.
- C.K. Woo, J. Zarnikau (2009) “Will Electricity Market Reform Likely Reduce Retail Rates?,” *The Electricity Journal*, Vol. 22(2), pp. 40-45.
- J. Zarnikau, Bill Prindle and Erica Allis (2009). “Barriers and Policy Solutions to Energy Efficiency as a Carbon Emissions Reduction Strategy,” in *Electricity Generation in a Carbon-Constrained World*, edited by F. P. Sioshansi, Elsevier.

- J. Zarnikau (2008). "Integrating Demand Response into Restructured Wholesale Markets," in *Competitive Electricity Markets: Design, Implementation, and Performance*, edited by F. P. Sioshansi, Elsevier.
- J. Zarnikau (2008). "The Quest for Competitive Electricity Markets," *LBJ Journal of Public Affairs*.
- J. Zarnikau, Parviz Adib (2007). "Texas: The Most Robust Restructured Electricity Market in North America," in *Electricity Market Reform: An International Perspective*, Ed. F. P. Sioshansi and Wolfgang Pfaffenberger, Elsevier.
- J. Zarnikau, Parviz Adib (2007). "Will the Texas Market Succeed, Where So Many Others Have Now Failed?," *Proceedings of the US Energy Association Conference*. Houston. August.
- J. Zarnikau, Mike Stockard, Phil Audet (2006). "Changing Installation Practices of A/C Installers – Three Years of Results," *ACEEE Summer Study on Energy Efficiency in Building*.
- J. Zarnikau (2006). "Using Demand Response Programs to Provide Operating Reserves in Wholesale Power Markets: A Case Study of the ERCOT Market," *US Energy Association's Dialogue*.
- J. Zarnikau, Alison Tribble, Kate Offringa, Bill Prindle, Dariush Arasteh, Arlene Stewart, Ken Nittler (2002). "Energy Efficient Windows in the Southern Residential Windows Market," *ACEEE Summer Study Proceedings*.
- J. Zarnikau, Amy Lam (1998). "Market concentration and market power among electricity generators in Texas," *The Electricity Journal*. 11:9, 60-64.
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- J. Zarnikau, Alex Lee (1997). "Agriculture: An Often-Overlooked Opportunity for Energy Conservation," *Strategic Planning for Energy and the Environment*.
- J. Zarnikau, Alex Lee (1996). "Energy Efficiency Opportunities in the Industrial Sector," *Energy Engineering*, Vol. 93, No. 3.
- J. Zarnikau (1997). "Taking Advantage of Real-Time Pricing Programs to Reduce Energy Costs in Manufacturing," *ACEEE Summer Study on Energy Efficiency in Industry Proceedings*, August.
- "Opportunities for Energy Efficiency in the Texas Industrial Sector," *ACEEE Summer Study on Energy Efficiency in Industry Proceedings*, August 1995; contributor.
- J. Zarnikau (1997). "Has Texas Become a Net Importer of Energy Resources?" *Texas Business Review*.
- J. Zarnikau (2001). "Plugging into the Texas Electricity Market: Avoiding the Mistakes of California?" *Texas Business Review*.
- J. Zarnikau (1999). "Rewired for Competition: The Restructuring of Electricity Markets in Texas?" *Texas Business Review*.
- J. Zarnikau (1994). "Integrated Resource Planning in the United States," *Proceedings of World Energy Council*, Neptune, Romania, June.

- J. Zarnikau (1993). "Design and Implementation of a Demand Cooperative," *Conference Proceedings: Demand-Side Management Opportunities and Perspectives in the Asia-Pacific Region*, International Energy Agency, Seoul, November.
- Philip Schmidt, Frederick T. Sparrow, John Vanston, and J. Zarnikau (1994). *Neoelectrification of Industry in the Information Age*, for the Edison Electric Institute.
- J. Zarnikau and Martin Baughman (1989). "Real-Time Pricing of Electricity: An Assessment," in *Proceedings of the Eleventh Annual Industrial Energy Technology Conference*, Houston, September.
- J. Zarnikau, Bill Moore and Martin Baughman (1989). "Wheeling Nonutility Power: The Texas Experience." *The Electricity Journal*, Vol. 2(7), pp. 32-41.

TESTIMONY BEFORE REGULATORY AGENCIES AND COURTS

- Arkansas PSC Docket No. 15-082-U: In the Matter of the Application of Arkansas Electric Cooperative Corporation for Modification of Rates and Charges.* Reviewed treatment of interruptible discount in rate rider. On behalf of Nucor Steel.
- Arizona Corporation Commission Docket No. E-04204A-15-0142: In the Matter of the Application of UNS Electric, Inc. for the Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of the Properties of UNS Electric, Inc., Devoted to its Operations Throughout the State of Arizona and Relative Approvals.* Rate Design. On behalf of Nucor Steel.
- State Office of Administrative Hearings (SOAH) Docket No. 473-14-5144 and Public Utility Commission of Texas (PUCT) Docket No.42866: Petition of Travis County Municipal District No. 12 Appealing Change of Wholesale Water Rates Implemented by West Travis County Public Utility Agency, City of Bee Cave, Hays County, and West Travis County Municipal Utility District No. 5.* Explored supplier's exercise of monopoly power.
- State Office of Administrative Hearings (SOAH) Docket No. 473-14-3445 and Public Utility Commission of Texas (PUCT) Docket No.42485: Application of Entergy Texas Inc. for Authority to Re-determine Rates for Energy Efficiency Cost Recovery Factor.* On behalf of Entergy Texas.
- California PUC Rulemaking 13-09-011 to Enhance the Role of Demand Response.* Compared the attributes of different types of demand response. On behalf of Pacific Gas and Electric.
- Arkansas PSC Docket No. 13-126-TF: In the Matter of a Request by Arkansas Electric Cooperative Corporation to Establish a Rider for the Collection of Certain Costs Related to the Transmission of Electricity by Other and TRO-Market Administration, Monitoring, and Compliance Services Costs.* Reviewed treatment of interruptible discount in rate rider. On behalf of Nucor Steel.
- Arizona Corporation Commission Docket No. E-04204A-12-0504: In the Matter of the Application of UNS Electric, Inc. for the Establishment of Just and Reasonable Rates and*

Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of the Properties of UNS Electric, Inc., Devoted to its Operations Throughout the State of Arizona and Relative Approvals. Rate Design. On behalf of Nucor Steel.

SOAH Docket No. 473-09-5470 and PUCT Docket No. 36633: Petition of CPS Energy for Enforcement Against AT&T Texas and Time Warner Cable Regarding Poll Attachments. Analysis of statistical issues. On behalf of Time Warner Cable.

Arkansas PSC Docket No. 12-053-U: In the Matter of the Application of Arkansas Electric Cooperative Corporation for Modification of Rates and Charges. Reviewed proposed interruptible credit riders in light of new state laws pertaining to the rate regulation of electric cooperatives. On behalf of Nucor Steel.

Arizona Corporation Commission Docket No. E-04100A-04-527: Application of Southwest Transmission Cooperative, Inc. for a Rate Increase. Provided cost allocation and rate design recommendations on behalf of the applicant.

Arkansas PSC Docket No. 09-071-U: In the Matter of the Application of Arkansas Electric Cooperative Corporation for Modification of Rates and Charges. Reviewed proposed interruptible credit riders in light of new state laws pertaining to the rate regulation of electric cooperatives. On behalf of Nucor Steel.

Virginia State Corporation Commission Case No. PUE-2007-00031 and PUE-2007-000033; Public Service Commission of West Virginia Case No.07-0508-E-CN; and Pennsylvania PUC Docket No. A-110172, Application of Trans-Allegheny Interstate Line Company for A Certificate of Convenience and Necessity to Construct a Transmission Line. Examined the feasibility of using demand-side management as an alternative to the proposed line. Testimony on behalf of the applicant.

PUCT Docket No. 31540: Proceeding to Consider Protocols to Implement a Nodal Market in the Electric Reliability Council of Texas Pursuant to PUC Subst. R. 25.501. Testimony before the PUCT on behalf of Nucor Steel and Chaparral Steel on demand side issues.

Public Service Commission of South Carolina, Docket No. 2005-1-E: Progress Energy Carolinas, Inc. Annual Review of Base Rates for Fuel Costs. Reviewed the utility's fuel costs and rates on behalf of a large industrial customer of the utility.

Railroad Commission of Texas, Docket No. 9400: Application of TXU Gas Company for a Rate Increase. Provided cost allocation and rate design testimony on behalf of a group of cities. Also provided testimony in a district court to support a Writ of Mandamus.

U.S. Bankruptcy Court, Southern District, In re. Texas Commercial Energy, LLC, Case No. 03-20366-C-11. Testified in support of a claim.

PUCT Docket No. 23950: Petition of Reliant Energy to Establish Price to Beat Fuel Factor. Presented (on the utility's behalf) a forecast of the Company's future sales of electricity.

PUCT Docket No. 23220: Petition for Approval of ERCOT Protocols. On behalf of Nucor Steel. Successfully introduced four coincident peak allocation of transmission costs.

PUCT Docket No. 22537: Application of Reliant Energy HL&P to Implement Wholesale Power Service – General Land Office Rate Schedule. Testified in support of tariff approval.

PUCT Docket No. 22355: Application of Reliant Energy HL&P for Approval of Unbundled Cost of Service Rate. Examined competitive opportunities that might be available to commercial and residential customers under various parties' rate design proposals.

PUCT Docket No. 22349: Application of Texas-New Mexico Power Company for Approval of Unbundled Cost of Service Rate. Requested (on behalf of the utility) funding for energy efficiency programs and system benefit fund programs.

PUCT Docket No. 21527: Application of TXU Electric Company for Financing Order to Securitize Regulatory Assets. Evaluated application on behalf of Nucor Steel.

PUCT Docket No. 17942: Application for Approval of Time-of-Use Rate Options for TU Electric Company. Analyzed utility proposal on behalf of Nucor Steel Company.

PUCT SOAH Docket No. 473-96-0333: Application of TU Electric Company for Real-Time Pricing Proposal in Compliance with the Commission's Order in Docket No. 14570. Analyzed the utility's filing on behalf of Nucor Steel Company.

PUCT Docket No. 9491: Texas-New Mexico Power Company rate case. Described applicable prudence standards and explored purchased power, cogeneration, and conservation as alternatives to the completion of the TNP One power plant project. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6992 Remand: Texas-New Mexico Power Company power plant certification case. Projected the costs of standby, wheeling, purchased power and cogeneration over a forty-year horizon, and explored purchased power, cogeneration, and conservation as alternatives to the completion of the TNP One power plant project. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 9300: TU Electric rate case. Recommended changes to proposed tariffs for interruptible service and explored other rate design and system planning issues. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 8425: Houston Lighting and Power Company rate case. Analyzed proposed tariffs for interruptible service, standby service, economic development rates and wheeling services, and recommended alternative rates and calculation methodologies. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 8422: Rita Blanca Cooperative tariff application. Proposed some modifications to the design of a proposed economic development tariff. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 8363: El Paso Electric Company rate case. Provided recommendations regarding future generation mix and total fuels expenses. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 7460: El Paso Electric Company rate case. Reviewed the demand forecasts upon which the utility relied in its decision to participate in the Palo Verde nuclear project. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 7195/6755: Gulf States Utilities Company rate case. Reviewed the demand forecasts upon which the utility relied in its decision to initiate the River Bend nuclear project. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6992: Texas-New Mexico Power Company power plant certification case. Projected the availability of purchased power and confirmed its viability as an alternative to the proposed TNP One power plant. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6184: Economic Viability for South Texas Unit 2. Analyzed the capabilities of various resource planning models to assist in selecting an appropriate means of determining the reasonableness of completing a nuclear power plant construction project. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 8191: Cherokee County Electric Cooperative rate case. Reviewed adjustments to test-year sales for weather normalization, demand, and numbers of customers data. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6375: Central Power and Light Company rate case. Reviewed adjustments to test-year sales for weather normalization, demand, and numbers of customers data. Critiqued the utility's long-term load forecast. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6105: Central Power and Light Company Avoided Cost calculation. Recommended rejection of the utility's long-term load forecast for the purpose of calculating long-run avoided costs. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6064: Houston Lighting and Power Company Avoided Cost calculation. Reviewed the utility's demand projections. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 5994: Inquiry into the rates paid by Houston Lighting and Power Company to Qualifying Facilities. Projected future demand for electricity on the utility system and the need for firm cogeneration capacity. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 8015: Amendment to TU Electric's certificate for the Comanche Peak nuclear plant. Reviewed the utility's future demand and capacity needs. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 6526: TU Electric Company power plant certificate case. Reviewed the utility's demand projections. Analyzed the utility's filing on behalf of PUCT Staff.

PUCT Docket No. 5568: Texas-New Mexico Power Company rate case. Reviewed adjustments to test-year sales for weather normalization, demand, and number of customers data, and miscellaneous operations and maintenance expenses. Analyzed the utility's filing on behalf of PUCT Staff.

OTHER ACTIVITIES

Teaches courses in Applied Regression Analysis and Introduction of Quantitative Analysis since 2003, Energy Policy and Economics in fall 2016, and Markets for Electricity in fall 2017.

ERCOT Working Group on Demand Side Resources, Founder and Co-Chair (2001)

Board Member and Vice President for Publications, Association of Energy Services Professionals, 2001-2007

Retail Energy Aggregators of Texas, Director, 2001-2003

State of Texas Energy Policy Partnership, Member, 1992

National Association of Regulatory Utility Commissioners Staff Subcommittee on Wheeling and Transmission, Member, 1990

Member of American Economic Association, International Association for Energy Economics, and American Statistical Association.