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## Education

- Post-Doctoral Fellow, Utility Planning and Policy Group, Energy and Environment Division, Lawrence Berkeley Laboratory, February 1991–July 1992. Conducted research on electric transmission policy. Advisor: Dr. Edward Kahn.
- Ph.D., Electrical Engineering and Computer Sciences, University of California, Berkeley, December 1990; GPA: 4.0.
  - Dissertation Title: “Improving Power System Operating Efficiency Through Real-Time Control and Tariffs.” Committee: Professor Felix Wu (Advisor and Chairman), Professor Pravin Varaiya, Professor Shmuel Oren.
  - Graduate Course Work: linear and non-linear system theory, continuous and discrete optimization, topology, real analysis, stochastic processes, information theory, power systems, time series analysis, technical writing.
- M.S., Electrical Engineering and Computer Sciences, University of California, Berkeley, May 1988; GPA: 4.0.
- B.E., Electrical Engineering, first-class honors, medal (pr. acc.), University of Sydney, Australia, March 1985; GPA: 4.0.
- B.Sc., Physics and Pure Mathematics, University of Sydney, Australia, March 1983; GPA: 4.0.

## Professional Experience

- Director, Center for Electric Vehicles: Transportation and Electricity Convergence, National Science Foundation Industry/University Cooperative Research Center, The University of Texas at Austin, 8/2011–present.
- Professor, Department of Electrical and Computer Engineering, The University of Texas at Austin, 9/03–present. Associate Professor, Department of Electrical and Computer Engineering, The University of Texas at Austin, 9/98–8/03. Assistant Professor, Department of Electrical and Computer Engineering, The University of Texas at Austin, 1/94–8/98. Conducted research on power system economics and continuous and discrete optimization applied to energy systems, integrated circuit layout, and ATM networks. Taught optimization, power systems, and probability and statistics courses. Supervised graduate students.
- Visiting Researcher, Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, 9/09–10/09 and 3/12. Conducted research on wind integration.
- Visiting Researcher, University of California Energy Institute, 6/00–8/00 and 7/01–8/01. Conducted research on equilibrium models of electricity markets.
- Research Fellow, Harvard Electricity Policy Group, John F. Kennedy School of Government, Harvard University, 9/00–12/00. Conducted research on equilibrium models of electricity markets.

- Staff Scientist, Utility Planning and Policy Group, Energy and Environment Division, Lawrence Berkeley Laboratory, 6/93–8/93. Conducted research on electric transmission planning and policy.
- Assistant Professor, Department of Electrical and Computer Engineering, Worcester Polytechnic Institute, 3/92–12/93. Conducted research in the areas of discrete and continuous optimization, with application to distributed computing environments, mixed-integer linear and non-linear programming, and power systems engineering. Taught control and power systems courses. Supervised graduate student.
- Research Assistant, Electronics Research Laboratory, University of California, Berkeley, 7/88–12/90. Conducted research on optimization theory applied to the coordination of capacitors in an electric distribution system and to improving the allocative efficiency of power system operation.
- Teaching Assistant, Electronics Research Laboratory, University of California, Berkeley, 2/89–5/89. Led discussion section and presented some lectures for the graduate course 221A, Linear System Theory.
- Professional Engineer, Grade 1, System Planning and Control Divisions, Electricity Commission of New South Wales, Australia, 3/85–7/86. Developed software for electricity system planning and control. Performed planning studies.
- Technical Trainee, Toshiba Corporation, Tokyo, Japan, 12/84–2/85. Observed the operation of the manufacturing facility at the Toshiba Fuchu plant.

### **Professional Consulting and Education Services**

- Suez North America, July 2011–August 2011. Reviewed ERCOT scarcity pricing mechanism.
- Direct Energy, May 2011–June 2011. Reviewed ERCOT shadow price cap mechanism.
- United Kingdom Ofgem, October 2010–May 2011. Participated in review and critique of transmission charging methodology in the United Kingdom and proposed alternatives.
- Convenor and Moderator, “The future of the electricity industry,” Austin, Texas, June 10, 2010.
- Midwest ISO, December 2009–December 2011. Developed theory and algorithm for improved inter-regional trade between Midwest ISO and adjacent regions.
- Alcoa Inc, April 2009–May 2010. Provided analysis of operation of the ERCOT electricity market.
- Direct Energy, September–October 2008. Provided analysis of contractual arrangements regarding wind contracts.
- John Deere Wind Energy, April 2008–April 2010. Provided analysis of non-contractual arrangements regarding wind issues.
- Compete Coalition, May 2008–March 2009. Provided analysis and comparison of uniform clearing price and pay-as-bid in electricity markets.
- Convenor and Moderator, “ERCOT Energized: The good, the bad, and the ugly of the new Texas Nodal Market Design,” Austin, Texas, May 2, 2008.
- FPL Energy, 2006–2007. Provided analysis of contractual arrangements regarding transmission services.

- Boston Pacific Company, 2004–2008, transmission consultant to Boston Pacific in their role as independent market monitor to the Southwest Power Pool.
- Competitive Power Advocates, December 2003–December 2010. Provide technical and consulting advice on restructuring of the ERCOT electricity market.
- Organizer and Lecturer, “Economics of Locational Marginal Pricing,” a one day course, 2003–present, taught under contract with ERCOT to ERCOT stakeholders, March 2006–November 2010.
- Organizer and Lecturer, “Introduction to Electric Power Systems for Legal and Regulatory Professionals,” a three day course, 1996–present.
- Competitive Power Advocates, December 2002–January 2003, “Shift Factors in ERCOT Congestion Management.” Provided evidence of economic and technical inefficiency of ERCOT congestion management protocol.
- Organizer and Moderator, “How will electric deregulation affect Texas?” Austin, Texas, May 2, 2001.
- Dynegy, Colonial Pipeline, March 2001. Prepared initial testimony in Public Utility Commission of Texas Docket No. 23335, “Application of Entergy and FPL Group Regarding Proposed Merger.”
- Frontier Economics, September 2000–April 2001. Provided expert opinion on transmission pricing proposal.
- Reliant Energy, October 1999–March 2000. Deposed in dispute between Reliant Energy and Municipalities served by Reliant concerning leasing arrangements.
- South Texas Electric Cooperative, July 1999. Prepared and filed testimony in Public Utility Commission of Texas Docket No. 19265, “Application of Central and Southwest Corporation and American Electric Power Company, Inc. Regarding proposed business combination.”
- Coalition for a Competitive Electricity Market, May 1999. Presentation at the Technical Conference on Capacity Benefit Margin, Federal Energy Regulatory Commission Docket No. EL99-46-000.
- Enron Corporation, October 1998–April 1999. Prepared testimony in Public Utility Commission of Texas Docket No. 19265, “Application of Central and Southwest Corporation and American Electric Power Company, Inc. Regarding proposed business combination.”
- Bracewell and Patterson, LLP, September–October 1996, February–October 1997. Provided expert opinion on transmission issues.
- California Energy Commission, June–August 1995. Conducted research on the effects of phase-shifting transformers in competitive electricity markets.
- Tenneco Power Generation Company, April 1995. Analyzed and prepared affidavit concerning contractual terms between Texas A&M University and Brazos Electric Power Cooperative.

**Book** *Applied Optimization: Formulation and Algorithms for Engineering Systems*, Cambridge University Press 2006.

#### **Refereed Journal Publications**

- Ross Baldick, “Wind and Energy Markets: A Case Study of Texas,” *IEEE Systems Journal*, 6(1):27–34, March 2012.
- David P. Tuttle and Ross Baldick, “The Evolution of Plug-in Electric Vehicle-Grid Interactions,” *IEEE Transactions on Smart Grid*, 3(1):500–505, March 2012.
- Lin Xu and Ross Baldick, “Transmission-Constrained Inverse Residual Demand Jacobian Matrix in Electricity Markets,” *IEEE Transactions on Power Systems*, 26(4):2311–2318, November 2011.
- Yen-Yu Lee, Ross Baldick, and Jin Hur, “Firm-based Measurements of Market Power in Transmission-Constrained Electricity Markets,” *IEEE Transactions on Power Systems*, 26(4):1962–1970, November 2011.
- Lin Xu, Ross Baldick, and Yohan Sutjandra, “Bidding Into Electricity Markets: A Transmission-Constrained Residual Demand Derivative Approach,” *IEEE Transactions on Power Systems*, 26(3):1380–1388, August 2011.
- Yen-Yu Lee, Jin Hur, Ross Baldick, and Salvador Pineda, “New indices of market power in transmission-constrained electricity markets,” *IEEE Transactions on Power Systems*, 26(2):681–689, May 2011.
- Jin Hur, Manho Joung and Ross Baldick, “Sequential Outage Checkers for Analyzing Cascading Outages and Preventing Large Blackouts,” *Journal of Electrical Engineering and Technology*, 6(5):585–594, May 2011.
- Ross Baldick and Richard P. O’Neill, “Estimates of comparative costs for upgrading transmission capacity,” *IEEE Transactions on Power Delivery*, 24(2):961–969, April 2009.
- Javier Salmeron, Kevin Wood, and Ross Baldick, “Worst-Case Interdiction Analysis of Large-Scale Electric Power Grids,” *IEEE Transactions on Power Systems*, 24(1):96–104, February 2009.
- Manho Joung, Ross Baldick, and You Seok Son, “The Competitive Effects of Ownership of Financial Transmission Rights in a Deregulated Electricity Industry,” *The Energy Journal*, 29(2):165–184, January 2008.
- Lin Xu and Ross Baldick, “Transmission-constrained Residual Demand Derivative in Electricity Markets,” *IEEE Transactions on Power Systems*, 22(4):1563–1573, November 2007.
- Ross Baldick, “Border flow rights and Contracts for differences of differences: Models for electric transmission property rights,” *IEEE Transactions on Power Systems*, 22(4):1495–1506, November 2007.
- Hanjie Chen and Ross Baldick, “Optimizing Short-Term Natural Gas Supply Portfolio for Electric Utility Companies,” *IEEE Transactions on Power Systems*, 22(1):232–239, February 2007.
- Ross Baldick and William Hogan, “Stability of Supply Function Equilibrium: Implications for daily versus hourly bids in a poolco market,” *Journal of Regulatory Economics*, 30(2):119–139, August 2006.
- Ross Baldick, Sergey Kolos, and Stathis Tompaidis, “Interruptible Electricity Contracts from an Electricity Retailers Point of View: Valuation and Optimal Interruption,” *Operations Research*, 54(4):627–642, July–August 2006.

- Hui Niu, Ross Baldick, and Guidong Zhu, “Supply Function Equilibrium Bidding Strategies with Fixed Forward Contracts,” *IEEE Transactions on Power Systems*, 20(4):1859–1867, November 2005.
- Ross Baldick, Udi Helman, Benjamin F. Hobbs, and Richard P. O’Neill, “Design of Efficient Generation Markets,” *Proceedings of the IEEE*, 93(11):1998–2012, November 2005.
- John Ning Jiang and Ross Baldick, “Distinguishing Design Flaws From Misconduct: A New Approach to Electricity Market Analysis,” *IEEE Transactions on Power Systems*, 20(3):1257–1265, August 2005.
- Richard P. O’Neill, Ross Baldick, Udi Helman, Michael H. Rothkopf, and William Stewart, Jr., “Dispatchable Transmission in RTO Markets,” *IEEE Transactions on Power Systems*, 20(1):171–179, February 2005.
- You Seok Son, Ross Baldick, Kwang-Ho Lee, and Shams Siddiqi, “Short-term Electricity Market Auction Game Analysis: Uniform and Pays-as-Bid Pricing,” *IEEE Transactions on Power Systems*, 19(4):1990–1998, November 2004.
- Bogdan Tutuianu, Ross Baldick, and Mark S. Johnstone, “Nonlinear Driver Models for Timing and Noise Analysis,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 23(11):1510–1521, November 2004.
- You Seok Son and Ross Baldick, “Hybrid Coevolutionary Programming for Nash Equilibrium Search in Games with Local Optima,” *IEEE Transactions on Evolutionary Computation*, 8(4):305–315, August 2004.
- You Seok Son, Ross Baldick, and Shams Siddiqi, “Reanalysis of ‘Nash Equilibrium Bidding Strategies in a Bilateral Electricity Market’,” *IEEE Transactions on Power Systems*, 19(2):1243–1244, May 2004.
- Javier Salmeron, Kevin Wood, and Ross Baldick, “Analysis of Electric Grid Security Under Terrorist Threat,” *IEEE Transactions on Power Systems*, 19(2):905–912, May 2004.
- Ross Baldick, Ryan Grant, and Edward Kahn, “Theory and Application of Linear Supply Function Equilibrium in Electricity Markets,” *Journal of Regulatory Economics*, 25(2):143–167, March 2004.
- Kwang-Ho Lee and Ross Baldick, “Solving three-player games by the matrix approach with application to an electric power market,” *IEEE Transactions on Power Systems*, 18(4):1573–1580, November 2003.
- Ross Baldick, “Variation of Distribution Factors with Loading,” *IEEE Transactions on Power Systems*, 18(4):1316–1323, November 2003.
- Richard O’Neill, Udi Helman, Ross Baldick, William Stewart, Michael Rothkopf, “Contingent Transmission Rights in the Standard Market Design,” *IEEE Transactions on Power Systems*, 18(4):1331–1337, November 2003.
- Kwang-Ho Lee and Ross Baldick, “Tuning of Discretization in Bimatrix Game Approach to Power System Market Analysis,” *IEEE Transactions on Power Systems*, 18(2):830–836, May 2003.
- Lance B. Cunningham, Ross Baldick, and Martin L. Baughman, “An Oligopoly Simulation of a Restructured ERCOT: Will Future Prices be Competitive?” *The Electricity Journal*, 16(3):59–71, April 2003.

- Ross Baldick, “Electricity market equilibrium models: The effect of parameterization,” *IEEE Transactions on Power Systems*, 17(4):1170–1176, November 2002.
- Lance B. Cunningham, Ross Baldick, and Martin L. Baughman, “An Empirical Study of Applied Game Theory: Transmission Constrained Cournot Behavior,” *IEEE Transactions on Power Systems*, 17(1):166–172, February 2002.
- R. Baldick, A. B. Kahng, A. A. Kennings, and I. L. Markov, “Efficient Optimization by Modifying the Objective Function,” *IEEE Transactions on Circuits and Systems*, 48(8):947–956, August 2001.
- Reza Ebrahimian and Ross Baldick, “State Estimation Condition Number Analysis,” *IEEE Transactions on Power Systems*, 16(2):273–279, May 2001.
- Reza Ebrahimian and Ross Baldick, “State Estimation Distributed Processing,” *IEEE Transactions on Power Systems*, 15(4):1240–1246, November 2000.
- Balho H. Kim and Ross Baldick, “A Comparison of Distributed Optimal Power Flow Algorithms,” *IEEE Transactions on Power Systems*, 15(2):599–604, May 2000.
- Ross Baldick, Balho H. Kim, Craig Chase, and Yufeng Luo, “A Fast Distributed Implementation of Optimal Power Flow,” *IEEE Transactions on Power Systems*, 14(3):858–863, August 1999.
- Shih-Yih Lai and Ross Baldick, “Unit Commitment with Ramp Multipliers,” *IEEE Transactions on Power Systems*, 14(1):58–64, February 1999.
- Gustavo de Veciana and Ross Baldick, “Resource Allocation in Multi-service Networks via Pricing: Statistical Multiplexing,” *Computer Networks and ISDN Systems*, 30(9–10):951–962, May 1998.
- N. Menezes, R. Baldick, and L.T. Pileggi, “A Sequential Quadratic Programming Approach to Concurrent Gate and Wire Sizing,” *IEEE Transactions on Computer-Aided Design*, 16(8):867–881, August 1997.
- Balho Kim and Ross Baldick, “Coarse-grained Distributed Optimal Power Flow,” *IEEE Transactions on Power Systems*, 12(2):932–939, May 1997.
- Ross Baldick and Edward Kahn, “Contract Paths, Phase-Shifters, and Efficient Electricity Trade,” *IEEE Transactions on Power Systems*, 12(2):749–755, May 1997.
- Ross Baldick, Kevin A. Clements, Zilha Pinjo-Dzagal, and Paul W. Davis, “Implementing Nonquadratic Objective Functions for State Estimation and Bad Data Rejection,” *IEEE Transactions on Power Systems*, 12(1):376–382, February 1997.
- Dan Jiang and Ross Baldick, “Optimal Electric Distribution System Switch Reconfiguration and Capacitor Control,” *IEEE Transactions on Power Systems*, 11(2):890–897, May 1996.
- Ross Baldick, “A Unified Approach to Polynomially Solvable Cases Of Integer ‘Non-Separable’ Quadratic Optimization,” *Discrete Applied Mathematics*, 61:195–212, 1995.
- Ross Baldick, “Refined Proximity and Sensitivity Results in Linearly-Constrained Convex Separable Integer Programming,” *Linear Algebra and Its Applications*, 226–228:389–408, September–October 1995.
- Ross Baldick, “The Generalized Unit Commitment Problem,” *IEEE Transactions on Power Systems*, 10(1):465–475, February 1995.

- Ross Baldick and Edward Kahn, “A Linear Model of Voltage Limited Transmission Interface Constraints,” *IEEE Transactions on Power Systems*, 10(1):476–482, February 1995.
- Edward Kahn and Ross Baldick, “Reactive Power is a Cheap Constraint,” *The Energy Journal*, 15(4):191–201, December 1994.
- Ross Baldick and Edward Kahn, “Network Costs and the Regulation of Wholesale Competition in Electric Power,” *Journal of Regulatory Economics*, 5(4):367–384, December 1993.
- Ross Baldick and Edward Kahn, “Transmission Planning Issues in a Competitive Economic Environment,” *IEEE Transactions on Power Systems*, 8(4):1497–1503, November 1993.
- Ross Baldick, “Generalization of Barahona’s Algorithm For Cases of Integer Non-Linear Programming With Box Constraints,” *Operations Research Letters*, 13(2):99–105, March 1993.
- Ross Baldick, R. John Kaye, and Felix F. Wu, “Electricity Tariffs Under Imperfect Knowledge of Participant Benefits,” *IEEE Transactions on Power Systems*, 7(4):1471–1482, November 1992.
- Ross Baldick and Felix F. Wu, “Approximation Formulas for the Distribution System: the Loss Function and Voltage Dependence,” *IEEE Transactions on Power Delivery*, 6(1):252–259, January 1991.
- Ross Baldick and Felix F. Wu, “Efficient Integer Optimization Algorithms for Optimal Coordination of Capacitors and Regulators,” *IEEE Transactions on Power Systems*, 5(3):805–812, August 1990.
- Ross Baldick and V. J. Gosbell, “The Capacitively Self-Excited Induction Generator,” *Journal of Electrical and Electronics Engineering, Australia*, 6(4):283–289, December 1986.

**Invited Presentations, Conference Papers, Book Chapters, Reports, Working Papers**

- Hector Chavez and Ross Baldick, “Inertia and Governor Ramp Rate Constrained Economic Dispatch to Assess Primary Frequency Response Adequacy,” International Conference on Renewable Energies and Power Quality (ICREPQ’12) Santiago de Compostela, Spain, March 28–30, 2012.
- Duehee Lee and Ross Baldick, “Limiting Ramp Rate of Wind Power Output using a Battery based on the Variance Gamma Process,” International Conference on Renewable Energies and Power Quality (ICREPQ’12) Santiago de Compostela, Spain, March 28–30, 2012.
- Ross Baldick, “The Curious Rise of Wind in Texas,” Keynote presentation at International Ruhr Energy Conference (INREC), Essen, Germany, March 6–7, 2012.
- Mahdi Kefayati and Ross Baldick, “Energy Delivery Transaction Pricing for flexible electrical loads,” Presented at the IEEE International Conference on Smart Grid Communications, Brussels, Belgium, October 17–20, 2011.
- Michael Chertkov, Mikhail Stepanov, Feng Pan, and Ross Baldick, “Exact and efficient algorithm to discover extreme stochastic events in wind generation over transmission Power Grids,” Presented at the 50th IEEE Conference on Decision and Control and European Control Conference, Orlando, Florida, December 12–15, 2011.
- Ross Baldick, “Minimum uplift assignment of transmission expansion costs to beneficiaries,” Presented at: the 49th Annual Allerton Conference on Communication, Control, and Computing, Monticello, Illinois, September 28–30, 2011; the Department of Integrated Systems Engineering, The Ohio State University, Columbus, Ohio, February 8, 2012; and Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, March 21, 2012.
- Ross Baldick, “Scarcity Pricing for Long-Term Reliability and Resource Availability,” Invited Presentation, Public Utility Commission of Texas workshop on Resource Adequacy and Shortage Pricing, Austin, Texas, June 30, 2011.
- Ross Baldick, “Computing the Electricity Market Equilibrium: Uses of market equilibrium models,” In Xiao-Ping Zhang, Editor, *Computing the Electricity Market Equilibrium*, IEEE Press and Wiley, 2010. Also presented at: the IEEE Power Engineering Society Power Systems Conference and Exposition, Atlanta, Georgia, October 29–November 1, 2006; the Department of Automation, Tsinghua University, Beijing, China, April 7, 2007; the Electrical and Electronic Engineering Department, The University of Hong Kong, April 27, 2007; PSR, Rio de Janeiro, Brazil, March 17, 2009; at the Universidad Industrial de Santander, Colombia, March 20, 2009; and Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, March 23, 2012.
- Ross Baldick, “Market power, market power mitigation, and efficiency,” Presented at the *IEEE Power and Energy Society General Meeting*, Minneapolis, Minnesota, July 25–29, 2010.
- Ross Baldick (Convenor) “The future of the electricity industry,” Austin, Texas, June 10, 2010. Available from [http://lifelong.engr.utexas.edu/shortcourse.cfm?course\\_num=1292](http://lifelong.engr.utexas.edu/shortcourse.cfm?course_num=1292).
- Judy Chang, Kamen Madjarov, Ross Baldick, Antonio Alvarez, and Philip Q. Hanser, “Renewable Integration Model and Analysis,” Presented at the *IEEE Transmission and Distribution Conference and Exposition*, New Orleans, LA, April 2010.

- Ross Baldick, “The impact of electricity markets and pricing on renewables,” Presented at *2010 Wind, Solar and Renewables*, Austin, TX, February 3–4, 2010.
- Cheol Hee Cho and Ross Baldick, “Augmented screening curve approach to optimizing generation capacity additions considering reserves,” Presented at Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, October 14, 2009. Also presented at: *Energy, Sustainability and Climate Change 2010*, Gainesville, FL, February 26–28, 2010; and *INFORMS 2010*, Austin, TX, November 7, 2010.
- Ross Baldick, “Wind and Energy Markets: A Case Study of Texas,” Presented at the Energy Retailers Association of Australia Briefing on *The Expanded Renewable Energy Target: Can our markets cope?* Sydney, Australia, August 10, 2009. Also presented at: the *Workshop on Renewable Energy Integration*, The University of New South Wales, Sydney, Australia, August 17, 2009; Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, September 24, 2009; Universidad de Castilla, La Mancha, Toledo campus, October 2, 2009; Judge Business School, Cambridge University, October 12, 2009; Department of Electrical and Computer Engineering, Iowa State University, November 16, 2009; *Harvard Electricity Policy Group Meeting*, Cambridge, MA, May 21, 2010; and *INFORMS 2010*, Austin, TX, November 8, 2010.
- Ross Baldick and Hui Niu, “Recent History of Electricity Market Restructuring in Texas,” Presented at Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, September 14, 2009.
- Ross Baldick, “Wind Energy and Electricity Markets,” Presented at the *National Academy of Engineering Regional Meeting*, College Station, Texas, April 29, 2009. Also presented at the University of Minnesota Internet-based seminar, June 8, 2009.
- Ross Baldick, “Locational Marginal Pricing,” Presentation to Public Utility Commission of Texas, Commissioner Kenneth Anderson and colleagues, April 2009.
- Ross Baldick, Badrul Chowdhury, *et al.* “Vulnerability Assessment for Cascading Failures in Electric Power Systems,” Presented at the *IEEE Power Systems Conference and Exposition*, Seattle, Washington, March 15–18, 2009.
- Ross Baldick, “Single Clearing Price in Electricity Markets,” Report, available from <http://www.competecoalition.com/files/Baldick%20study.pdf>, February 2009.
- Manho Joung, Ross Baldick, and J. Kim, “Strategic Behavior in Electricity Capacity Markets,” Presented at *Hawaii International Conference on System Sciences (HICSS-42)*, Waikoloa, Hawaii, January 2009.
- Ross Baldick, Mladen Kezunovic, and Ivan Damnjanovic, “PHEVs as Dynamically Configurable Dispersed Energy Storage,” Power Systems Engineering Research Center 2008 IAB Meeting, College Station, Texas, December 2008.
- Ross Baldick, “Myth: Nodal pricing is bad for wind,” Presented at the Texas Renewable Energy Industries Association Fall 2008 Conference, Austin, Texas, November 2008
- Lin Xu and Ross Baldick, “Stability of Supply Function Equilibrium in Electricity Markets under Piecewise Linear Function Perturbations,” Presented at the 46th Annual Allerton Conference on Communication, Control, and Computing, Monticello, Illinois, October 24–25, 2008.
- Ross Baldick, “Electric Economics and Wind,” Presented to the Central Texas Association for Energy Economics, Austin, Texas, October 2008

- Ross Baldick and Lin Xu, “Theory and application of transmission-constrained residual demand derivative in electricity markets,” Invited Presentation, Visiting speaker series, Department of Economics, University of Guelph, September 19, 2008.
- Ross Baldick and Michael Caramanis, “Using Controlled PEV Charging to Enhance Wind Energy,” Presented at the Workshop on the Role of Plug In Hybrid Electric Vehicles, Austin, Texas, August 18–19, 2008.
- Ross Baldick, Badrul Chowdhury, *et al.* “Initial Review of Methods for Cascading Failure Analysis in Electric Power Systems,” *Proceedings of the 2008 IEEE Power Engineering Society General Meeting*, Pittsburgh, Pennsylvania, July 20–24, 2008.
- Manuel Hernandez, Lin Xu, Steven Puller, and Ross Baldick, “Tools for Assessing Offers into Electricity Auctions,” Presented at the Power Systems Engineering Research Center Meeting, Ames, Iowa, May 14–16, 2008. Also, keynote presentation at The Seoul International Conference on Electricity Markets, Seoul, South Korea, June 18–20, 2008.
- Ross Baldick (Convenor) “ERCOT Energized: The good, the bad, and the ugly of the new Texas Nodal Market Design,” Austin, Texas, May 2, 2008. Presentations available from <http://lifelong.engr.utexas.edu/ercot/schedule.cfm>.
- Manho Joung and Ross Baldick, “Moral Hazard in Electricity Capacity Markets,” Presented at the *Fourth Annual Carnegie Mellon Conference on the Electricity Industry: Future Energy Systems: Efficiency, Security, Control*, Pittsburgh, Pennsylvania, March 2008.
- Ross Baldick, “ERCOT Transition to Nodal Markets—The Basics for Lawyers,” Presented at the Institute for Energy Law, Power and Alternative Energy Conference, Houston, Texas, April 22, 2008. Also presented at: the Wind Energy Institute 2008, Austin, Texas, February 19, 2008 and to the Texas Commission on Environmental Quality, June 23, 2008.
- Javier Salmeron, Kevin Wood, and Ross Baldick, “Vulnerability of Electric Power Grids,” Invited Presentation, IEEE Columbus PES Meeting, November 19, 2007.
- Ross Baldick, “Border flow rights and contracts for differences of differences: Models for electric transmission property rights,” Power Systems Engineering Research Center Tele-seminar, May 1, 2007. Also presented at the Graduate Power Seminar, Arizona State University, September 21, 2007; the INFORMS Annual Meeting, Washington, DC, October 12–15, 2008; and the Universidad Industrial de Santander, Colombia, March 19, 2009.
- Lin Xu and Ross Baldick, “Supply Function Dynamics, Equilibrium, and Local Stability Analysis in Electricity Markets,” Presented at the 2006 INFORMS General Meeting, Pittsburgh, November 4–8, 2006.
- Ross Baldick, “Applied Optimization: Formulation and Algorithms for Engineering Systems,” Presented at the 2006 INFORMS General Meeting, Pittsburgh, November 4–8, 2006.
- Ross Baldick, “Upcoming Changes to the Texas Wholesale Electricity Market,” Presented at the Department of Electrical Engineering, The University of New South Wales, Australia, July 20, 2006.
- Richard O’Neill, Udi Helman, Benjamin Hobbs, and Ross Baldick, “Independent system operators in the United States: History, lessons learned, and prospects.” In F. P.

Sioshansi and W. Pfaffenberger, Editors, *International Experience in Restructured Electricity Markets: What works, what does not, and why?* Elsevier, 2006.

- Ross Baldick, “Market Power Mitigation,” Gulf Coast Power Association, September 2005
- Hui Niu and Ross Baldick, “An Empirical Analysis of Market Efficiency,” *Proceedings of the 2005 IEEE Power Engineering Society General Meeting*, San Francisco, June 2005.
- Ross Baldick, Krishnan Dixit, and Thomas Overbye, “Empirical Analysis of the Variation of Distribution Factors with Loading,” *Proceedings of the 2005 IEEE Power Engineering Society General Meeting*, San Francisco, June 2005. Also presented at the University of New South Wales, Australia, August 2003.
- Ross Baldick, “Decomposition and coordination of large-scale power systems,” Presented at the National Science Foundation workshop on seams issues, Arlington, Virginia, October 2004. Also presented at the 2005 IEEE Power Engineering Society General Meeting panel on “Inter-regional Market Coordination,” June 2005.
- Ross Baldick, “Economic Dispatch,” Presentation to The Texas House Committee on Regulated Industries, September 24, 2004.
- Ross Baldick, “Electricity for Telecom Lawyers,” Presented at the Texas Bar Public Utility Law Section Annual Meeting, August 20, 2004.
- Ross Baldick and Hui Niu, “Lessons Learned: The Texas Experience.” In James Griffin and Steven Puller, Editors, *Electricity Deregulation: Where to from here?* University of Chicago Press, 2005. Presented at Bush School of Government and Public Service, Texas A&M University, College Station, Texas, April 4, 2003.
- Ross Baldick, “Reactive Issues: Reactive power in restructured markets,” *IEEE Power and Energy Magazine*, 2(6):14–17, November/December 2004.
- Ross Baldick, “Decomposition and coordination of large-scale power systems,” Presented at the National Science Foundation workshop on seams issues, Arlington, Virginia, October 2004. Also presented at the 2005 IEEE Power Engineering Society General Meeting panel on “Inter-regional Market Coordination,” June 2005.
- Stathis Tompaidis, Ross Baldick, and Sergey Kolos, “Valuation and Optimal Interruption for Interruptible Electricity Contracts,” *INFORMS Annual Meeting*, Atlanta, October 2003.
- Ross Baldick, “Market-based transmission: Property rights meet Kirchhoff,” Presented at the *2003 IEEE PES Transmission and Distribution Conference and Exposition*, Dallas, Texas, September 7–12, 2003.
- Ross Baldick, “Shift Factors in ERCOT Congestion Pricing,” Technical Report, March 2003. Presented at the Public Utility Commission of Texas, January 14, 2003.
- M. Milosevic, L. F. C. Pessoa, B. L. Evans, and R. Baldick, “DMT Bit Rate Maximization With Optimal Time Domain Equalizer Architecture,” Invited Paper, *IEEE Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2002.
- You Seok Son, Ross Baldick, Kwang Ho Lee, and Shams Siddiqi, “Multi-unit Auctions with Market Power: Uniform and Pay-as-bid Pricing in an Electricity Market,” Presented at the 22nd USAEE/IAEE North American Conference Vancouver, British Columbia, October 6-8, 2002.

- Ross Baldick, “Power Grid Concerns: Energy Fueling the Tech Sector” Technology Advisors Group, Austin, Texas, August 30, 2002.
- Ross Baldick, “Grid Limitations,” Presented at the President’s Council of Advisors on Science and Technology Distributed Energy Workshop, University of Texas at Austin, August 15, 2002.
- Ross Baldick and William Hogan, “Stability of supply function equilibria: Implications for daily versus hourly bids in a poolco market,” *Proceedings of the Seventh Annual POWER Research Conference*, University of California Energy Institute, Berkeley, CA, March 2002. Also presented at: Australian Bureau of Agricultural and Resource Economics, Canberra, Australia May 17, 2002; the Department of Electrical Engineering, The University of New South Wales, Australia, May 22, 2002; the University of Wisconsin at Madison, October 2001; Department of Economics, University of Paris XI, France, October 2002; and Department of Electrical Engineering, The University of Chile, November 2005.
- Debabrata Chattopadhyay and Ross Baldick, “Unit Commitment With Probabilistic Reserve,” *Proceedings of 2002 IEEE Power Engineering Society Winter Meeting*, New York, NY, January 2002, 1:280–285.
- Ross Baldick and William Hogan, “Capacity Constrained Supply Function Equilibrium Models of Electricity Markets: Stability, Non-decreasing Constraints, and Function Space Iterations,” University of California Energy Institute POWER Paper PWP-089, [www.ucei.berkeley.edu/ucei/PDF/pwp089.pdf](http://www.ucei.berkeley.edu/ucei/PDF/pwp089.pdf), December 2001, Revised September 2002.
- Ross Baldick, “An Electric Power Research Agenda for Texas,” Invited presentation, Texas Conservative Forum Fall Conference on Texas’ Role in the National Energy Policy, September 2001.
- Shih-Yih Lai and Ross Baldick, “Buffered Interconnect Tree Optimization Using Lagrangian Relaxation,” *Proceedings of the International Conference on Computer Design*, Austin, Texas, September 23–26, 2001, pages 199-206.
- Ross Baldick, “Transmission key to avoiding California-style blackouts in Texas,” *Austin American-Statesman*, July 2001.
- Ross Baldick, “Supply Function versus Cournot Equilibrium Models in Electricity Markets,” Invited Presentation, INFORMS Annual Meeting, San Antonio, November 2000.
- Ross Baldick, Ryan Grant, and Edward P. Kahn, “Linear Supply Function Equilibrium: Generalizations, Application, and Limitations,” University of California Energy Institute POWER Paper PWP-078, [www.ucei.berkeley.edu/ucei/PDF/pwp078.pdf](http://www.ucei.berkeley.edu/ucei/PDF/pwp078.pdf), August 2000. Presented at the Harvard Electricity Policy Group, Cambridge, MA, October 2000. Also presented at the Department of Electrical and Computer Engineering, The University of Wisconsin at Madison, October 2000; INFORMS Annual Meeting, San Antonio, November 5-8 2000; the Department of Electrical and Computer Engineering, The University of Washington, Seattle, March 2001; Department of Electrical Engineering, University of Chile, November 2005; Universidad Industrial de Santander, Colombia, March 20, 2009; and Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain, March 23, 2012.
- Ross Baldick, “Developing Economic Signals to Deal with Congestion and Parallel Path Issues Between RTOs,” *Proceedings of INFOCAST Conference*, Orlando, Florida, December 1999.

- Ross Baldick, “Alternative formulations, multiplicity of solutions, and unpriced products,” DIMACS/EPRI Workshop on The Next Generation of Unit Commitment Models, Rutgers University, Piscataway, New Jersey, September 27–28, 1999.
- Ross Baldick, “Coordination of large scale power systems,” *Proceedings of 1999 IEEE Power Engineering Society Winter Meeting*, 1999, 2(626).
- Ross Baldick, “Capacity Benefit Margin,” Presented at the FERC Technical Conference on Capacity Benefit Margin, Washington, DC, May 1999.
- Ross Baldick, Andrew B. Kahng, Andrew Kennings, and Igor L. Markov, “Function Smoothing with Applications to VLSI Layout,” *Proceedings of the Design Automation Conference*, Hong Kong, January 1999, 1(225-228).
- Ross Baldick, “Coordination by Tie-line Decomposition,” Invited Presentation at the Special Session of the Harvard Electricity Policy Group on Regional Boundaries, Regional Markets and Regional Institutions, Milwaukee, Wisconsin, November 20, 1998.
- Ross Baldick, “IPPs get VAMMoed in Texas,” In Georges Zaccour, *Deregulation of Electric Utilities*, pages 1–23, Kluwer Academic Publishers, Boston, 1998.
- Ross Baldick, “Independent System Operators,” Invited Presentation at the Sixth Seminar on Restructuring Issues, Louisiana State University, September 1997.
- Xiaohong Guan, Ross Baldick, and W.-H. Edwin Liu, “Integrating Power System Scheduling and Optimal Power Flow,” *Proceedings of the 12th Power Systems Computation Conference*, Dresden, Germany, 19–23 August, 1996, pages 717–723.
- N. Menezes, R. Baldick, and L. Pileggi, “A Sequential Quadratic Programming Approach to Concurrent Gate and Wire Sizing,” *Proceedings of the International Conference on Computer-Aided Design*, November 7–10, 1995, pages 144–151.
- C. A. Goldman, J. F. Busch, E. P. Kahn, R. Baldick, and A. Milne, “Review of Consolidated Edison’s Integrated Resource Bidding Program,” Report LBL-33599, Energy Analysis Program, Lawrence Berkeley Laboratory, July 1993.
- Ross Baldick and Edward Kahn, “Network Costs and the Regulation of Wholesale Competition in Electric Power,” Presented at the Western Economic Association International 68th Annual Conference, Lake Tahoe, Nevada, June 20–24, 1993.
- Ross Baldick and Edward Kahn, “Transmission Planning in the Era of Integrated Resource Planning: A Survey of Recent Cases,” Report LBL-32231, Energy Analysis Program, Lawrence Berkeley Laboratory, September 1992.
- Ross Baldick and Edward Kahn, “Regulation and Transmission Planning for Electric Power,” Advanced Workshop in Regulation and Public Utility Economics, Fifth Annual Western Conference, San Diego, California, July 8–10, 1992.
- Ross Baldick, “Coordination of Distribution System Capacitors and Regulators: An Application of Integer Quadratic Optimization.” In C. T. Leondes, *Control and Dynamic Systems, Volume 42: Analysis and Control System Techniques for Electric Power Systems*, pages 245–291, Academic Press, Inc., San Diego, 1991.
- Ross Baldick, “Optimal On-Off Control of Capacitors in a Distribution System,” Master’s Report, University of California, Berkeley, May 1988.

#### Awards, Scholarships, and Honors

- Erasmus Mundus scholar, 2009.
- University of Texas Faculty Research Assignment, Fall 2009.
- Technical Committee Program Coordinator, *IEEE Power Engineering Society General Meeting*, 2008.
- Fellow of the Institute of Electrical and Electronics Engineers, 2007, citation “for contributions to analysis of power system economics.”
- IEEE Power Engineering Society, Power System Analysis, Computing, and Economics Technical Committee Prize Paper Award, 2006 (with Richard P. O’Neill, Udi Helman, Michael H. Rothkopf, and William Stewart, Jr.)
- Best Presentation in Energy Sponsored Sessions Award, INFORMS Conference, Atlanta, Georgia, October 2003 (with Stathis Tompaidis and Sergey Kolos).
- Leland Barclay Fellowship in Engineering, 2003-2011.
- Associate Editor, *IEEE Transactions on Power Systems*, 2004–present.
- Visiting Researcher, University of California Energy Institute, June–August 2000, July–August 2001, June–August 2002, and June–July 2003.
- Research Fellow, Harvard Electricity Policy Group, John F. Kennedy School of Government, Harvard University, September–December 2000.
- University of Texas Faculty Research Assignment, Fall 2000.
- Engineering Foundation Faculty Award, University of Texas at Austin, 1997.
- Non-Resident Tuition Scholarship, University of California, 1990.
- Non-Resident Tuition Scholarship, University of California, 1989.
- Regents Fellowship/Edward J. Norcross Fellowship, University of California, 1988–1989.
- James King of Irrawang Scholarship, University of Sydney, Australia, 1988.
- Semi-finalist, Honeywell Futurist Essay Competition, 1988.
- Regents Fellowship, University of California, 1987–1988.
- Distinguished Pass, Ph.D. Preliminary Exams, 1987.
- James King of Irrawang Scholarship, University of Sydney, Australia, 1987.
- Regents Fellowship, University of California, 1986–1987.
- J. B. Watt Travelling Scholarship, University of Sydney, Australia, 1986–1989.

### Research Funding

- “Defending Interdependent Infrastructure Systems,” Defense Threat Reduction Agency, \$1,100,008, 2010-2013.
- “Principles based modeling of costs of integrating intermittent renewable generation,” \$359,667, September 2011–August 2014.
- “IGERT: Sustainable Grid Integration of Distributed and Renewable Resources,” National Science Foundation, \$3,070,531, September 2010–August 2015.
- “Techno-economic Modeling of the Integration of 20% Wind and Large Scale Energy Storage in ERCOT,” Department of Energy, \$501,668, March 2010–September 2012.

- “Collaboration between The University of Texas at Austin, Department of Electrical and Computer Engineering and ERCOT,” Electric Reliability Council of Texas, \$320,000, August 2009–December 2012.
- “PEVs as Dynamically Configurable Dispersed Energy Storage,” Power Systems Engineering Research Center, \$70,000, July 2009–August 2011.
- “Transocean Power Plant Analysis and Modeling Initiative,” Transocean Offshore Deep-water Drilling, Inc., \$128,000, September 2008–June 2011.
- “Tools for Assessment of Transmission-Constrained Market Power in Electricity Markets,” National Science Foundation Research Grant, \$200,000, August 2008–July 2011.
- “Tools for Assessment of Bidding into Electricity Auctions,” Power Systems Engineering Research Center, \$60,000, July 2006–August 2008.
- “Reducing the Vulnerability of Electric Power Grids to Terrorist Attacks,” Department of Energy Research Grant, \$241,500, July 2005–June 2007.
- “Transmission Constrained Supply Function Equilibrium Analysis of Electric Power Markets,” National Science Foundation Research Grant, \$120,000, September 2004–August 2006.
- “Analysis and Simulation of Strategic Behavior and Price Processes in Transmission Constrained Electricity Markets,” National Science Foundation Research Grant, \$100,000, 2000–2002.
- Optimal Power Flow Software, Donated by Decision Systems International, \$50,000, 1996.
- Wattsim, Operator Training Simulator Software, Donated by Incremental Systems, Inc, \$100,000, 1995.
- “Integration of Institutional and Technical Issues in Electric Transmission,” University Research Institute Summer Research Award, \$11,000, 1995.
- National Science Foundation Young Investigator Award, \$300,000, 1994–2000.
- National Science Foundation Research Initiation Award, \$95,000, 1993–1998.

### Professional Society Memberships

- IEEE Power Engineering Society, Former chair of System Economics Subcommittee of Power Systems Analysis, Computing and Economics Committee.
- SIAM.
- INFORMS.
- IAEE/USAEE.