

DOUGLAS J. GOTHAM

PROFESSIONAL EMPLOYMENT

August 1992 to present	State Utility Forecasting Group, Purdue University, West Lafayette, IN 47907-1293
July 2005 to present	<i>Director</i>
November 1998 to July 2005	<i>Associate Director</i>
May 1997 to November 1998	<i>Senior Analyst</i>
May 1994 to May 1997	<i>Research Analyst</i>
August 1992 to May 1994	<i>Graduate Research Assistant</i>

The State Utility Forecasting Group (SUFG) is an independent research and analysis group, established by the Indiana General Assembly, funded by the state government through the Indiana Utility Regulatory Commission (IURC), and dedicated to providing forecasts of electricity consumption, production, and prices for eight utilities in the state. SUFG has performed several policy studies for the IURC, analyzing such diverse topics as new construction needs, impacts of environmental regulation, renewable and intermittent resources, demand-side management and load conservation, advanced metering infrastructure, and the impacts of proposed deregulation of Indiana's electricity generation industry on Indiana customers and utilities.

In 2014, SUFG was selected to provide a series of long-term forecasts for the Midcontinent Independent System Operator (MISO). This entails the construction of 15 forecasting models at the individual state level, as well as models to allocate the statewide projections to the MISO Local Resource Zone (LRZ) level and the development of models to determine the peak demand projections at the LRZ and MISO system-wide levels.

The Director is responsible for the daily operation and planning of SUFG; serves as the primary liaison with the IURC, MISO, various stakeholders at the Indiana and MISO levels, press, and other interested parties; is responsible for the preparation of staff reports; prepares and presents regulatory and legislative testimony; supervises the SUFG staff on the development, maintenance, and improvement of various SUFG models; works with various University faculty on the direction of graduate student research; negotiates and writes research proposals; and manages the budgets and expenditures of active research projects.

Previous duties included serving as one of two Indiana delegates and subsequently as an engineering/modeling consultant to the Eastern Interconnection States Planning Council (EISPC), an organization that consisted of 39 states, the District of Columbia and various Canadian provinces. EISPC worked with various stakeholders to perform long-term resource planning for the Eastern Interconnection. Additional EISPC responsibilities included serving as head of the Modeling Work Group and as a member of various other work groups, task forces, and teams.

June 1983 to June 1989

Nuclear Operator, United States Navy

Controlled electric power generation and power distribution for a nuclear-powered warship. Operated nuclear propulsion plant. Performed preventive and corrective maintenance on electric motors, generators, control panels, and switchgear. Supervised electric maintenance and administrative workcenters. Prepared and delivered training lectures to other nuclear operators.

EDUCATION

December 1996

Doctor of Philosophy

Major Professor: Dr. Gerald T. Heydt

Purdue University

West Lafayette, IN 47907

December 1993

Master of Science in Electrical Engineering

Major Professor: Dr. Gerald T. Heydt

Purdue University

West Lafayette, IN 47907

May 1992

Bachelor of Science in Electrical Engineering

Magna Cum Laude

Michigan Technological University

Houghton, MI 49934

THESES

Gotham, D. J. Ph.D. Dissertation. "Flexible AC Transmission Systems in Power Network Analysis and for Power Flow Control," December 1996.

Gotham, D. J. MSEE Thesis. "Automatic Generation Control Response in Power Systems Using Short Term Load Forecasting Information," December 1993.

MEMBERSHIPS

IEEE (1992-present)

Member

Power Engineering Society

Journal Article Reviewer

Indiana Energy Conference Planning Committee (2010-present) Member

Organization of PJM States Independent States' Agencies
Committee (2012-present)

Member

Indiana Biomass Working Group (2008-2013)

Member

Vectren Energy Efficiency Oversight Board (2006-2012)

Member

Indiana Wind Working Group (2005-2011)

Member

Eastern Interconnection States' Planning Council (2009-2015) Delegate

Reference Case Workgroup

Modeling Workgroup - leader

EXPERT TESTIMONY

Indiana General Assembly Regulatory Flexibility Committee and Interim Study Committee on Energy, Utilities, and Telecommunications, annual reporting on the status of renewable energy resources in the state of Indiana and various other SUFG reports, 2005 – 2023.

Indiana General Assembly 21st Century Energy Task Force, September 2019 and October 2019, on SUFG's forecast; August 2021, on impact of electric vehicles.

Indiana General Assembly House Utility, Energy and Telecommunications Committee, March 2019, on SUFG's forecast.

Manitoba Public Utilities Board Needs for and Alternatives To (NFAT) proceedings for Manitoba Hydro's proposed hydroelectric expansion, April 2014, regarding Manitoba Hydro's load forecast and export price projections.

Indiana General Assembly Senate Utilities Committee, February 2013, on natural gas prices.

Indiana General Assembly House Commerce Committee, January 2010, on SUFG's forecast.

Indiana General Assembly House Ways and Means Committee, February 2005, on SUFG's forecast.

IURC Cause No. 42145, July 2002, regarding the need for proposed new capacity from both a statewide and individual utility basis, the appropriateness of the type of proposed new capacity, and the adequacy of the bulk transmission system to transfer the output of the proposed new capacity to the customers.

CLASSROOM TEACHING EXPERIENCE

ECE 432, "Elements of Power System Engineering," Spring semester 2005, Purdue University. Student instructor evaluation score, 3.38 on a 4.0 scale; department average for undergraduate courses, 3.04.

Guest lecturer, IE 590, "Power Systems and Smart Grid," February 2012, Purdue University.

Guest lecturer, V600: Capstone in Public and Environmental Affairs, "Electricity Future," March 2009, School of Public and Environmental Affairs, Indiana University.

Guest lecturer (two weeks), ECE 532, "Computational Methods for Power System Analysis," October 2000, Purdue University.

OTHER TEACHING EXPERIENCE

Instructor, 2006 - 2019, Advanced Regulatory Studies Programs, Institute of Public Utilities, Michigan State University.

Instructor, 2007 - 2011, 2013 - 2018, Camp NARUC, Institute of Public Utilities, Michigan State University.

Instructor, 2010 - 2011, 2013 – 2014, Grid Schools, Institute of Public Utilities, Michigan State University.

Instructor, 2010 - 2012 Forecasting Workshops/Schools, Institute of Public Utilities, Michigan State University.

Short-course instructor, "Tutorial on Electric Power Systems," October 1993.

Training lecturer, U. S. Navy nuclear operators, USS Arkansas, CGN-41, 1987-1989.

SPONSORED RESEARCH

“Independent Load Forecasts for the Midcontinent Independent System Operator (MISO),” Midcontinent Independent System Operator, January 2024 – June 2025, Principal Investigator.

“To Continue the Work of the State Utility Forecasting Group from July 2021 through June 2023,” Indiana Utility Regulatory Commission, July 2021 – June 2023, Co-Principal Investigator, project budget \$4,767,813.

“To Continue the Work of the State Utility Forecasting Group from July 2019 through June 2021,” Indiana Utility Regulatory Commission, July 2019 – June 2021, Co-Principal Investigator, project budget \$1,413,240.

“Annual Independent Load Forecasts for the Midcontinent Independent System Operator (MISO),” Midcontinent Independent System Operator, January 2018 – December 2023, Principal Investigator.

“Assistance and Expert Testimony to the Manitoba Hydro General Rate Application (GRA) Proceeding,” Public Interest Law Centre, July 2017 – January 2018, Principal Investigator, \$12,006.

“To Continue the Work of the State Utility Forecasting Group from July 2017 through June 2019,” Indiana Utility Regulatory Commission, July 2017 – June 2019, Co-Principal Investigator, project budget \$1,139,653.

“Coal-power plants rejuvenated with biomass: An economic, social, and environmental sustainable transition to clean power,” National Institute of Food and Agriculture, April 2017 – March 2021, Co-Principal Investigator, project budget \$492,099.

“To Continue the Work of the State Utility Forecasting Group,” Indiana Utility Regulatory Commission, July 2015 – June 2017, Co-Principal Investigator, project budget \$1,389,653.

“A Proposal to Provide Independent Energy and Peak Demand Forecasts to the Midcontinent System Operator (MISO),” Midcontinent Independent System Operator, January 2014 – December 2017, Principal Investigator.

“Proposal to Provide Assistance and Expert Testimony to the Need For and Alternatives To (NFAT) Proceeding Regarding Manitoba Hydro’s Proposed Keeyask Hydroelectric Facility,” Public Interest Law Centre, September 2013 – May 2014, Principal Investigator, \$34,994.

“Proposal to Provide Transmission Engineering Assistance to the Eastern Interconnection States’ Planning Council (EISPC),” National Association of Regulatory Utility Commissioners, September 2013 – November 2014, Principal Investigator, \$180,671.

“To Continue the Work of the State Utility Forecasting Group,” Indiana Utility Regulatory Commission, July 2013 – June 2015, Co-Principal Investigator, project budget \$1,139,653.

“Assessing the Prospects for Biopower,” U.S. Department of Agriculture Office of the Chief Economist, September 2012 – December 2013, Co-Principal Investigator, project budget \$46,698.

“Proposal to Assist the Eastern Interconnection States’ Planning Council (EISPC) Members with Transmission Planning Services,” National Association of Regulatory Utility Commissioners, February 2011 – August 2013, Principal Investigator, \$152,023.

"To Continue the Work of the State Utility Forecasting Group," Indiana Utility Regulatory Commission, July 2011 – June 2013, Co-Principal Investigator, project budget \$1,139,653.

"A Proposal to Develop a Statewide Database of Energy Efficiency Efforts in Indiana," Indiana Office of the Lieutenant Governor, Office of Energy Development, May 2010 – May 2012, Principal Investigator, project budget, \$97,474.

"To Continue the Work of the State Utility Forecasting Group," Indiana Utility Regulatory Commission, July 2009 - June 2011, Co-Principal Investigator, project budget \$1,298,974.

"Development of a Primer to Aid Rural Utilities in the Evaluation of Renewable Power Opportunities," U.S. Department of Agriculture Office of the Chief Economist, August 2008 - December 2010, Co-Principal Investigator, project budget \$66,196.

"Long-term Electricity Forecast for the State of Mississippi," Mississippi Development Authority, July 2008 - December 2008, Principal Investigator, project budget \$17,906.

"To Continue the Work of the State Utility Forecasting Group," Indiana Utility Regulatory Commission, July 2007 - June 2009, Co-Principal Investigator, project budget \$1,299,166.

"To Continue the Work of the State Utility Forecasting Group," Indiana Utility Regulatory Commission, July 2005 - June 2007, Co-Principal Investigator, project budget \$1,293,617.

"Economics of Criticality in the Restoration of Energy Infrastructures," Sandia National Laboratories, August 2004 - September 2005, Principal Investigator, project budget \$8,758.

"Center for Security of Large Scale Systems/Task 5," P. C. Krause and Associates, Inc./U. S. Army, March 2004 - August 2005, Co-Principal Investigator, personal portion of the task budget \$30,000.

"Enhancing the Operation of Highly Varying Industrial Loads to Increase Electric Reliability, Quality, and Economics," DOE research program with NIPSCO and Colorado School of Mines, 2000 - 2002, Principal Investigator, Purdue University portion of the project budget \$441,572.

"Costs and Proper Charges for Serving Widely Varying Loads," Electric Power Research Institute, July 1997 - June 1998, Co-Principal Investigator, total project budget \$61,500.

THESIS COMMITTEES

Veronica Bosquez Foti, Ph.D., Industrial Engineering, "Distributed Optimization Algorithms for Interregional Coordination of Electricity Markets," 2021.

Travis Atkinson, Ph.D., Agricultural Economics, "Long-Term Infrastructure Investment Planning and Policy Analysis for the Electricity Sector in Small Island Developing States: Case for Jamaica," 2020.

Jeffrey Opgrand, Ph.D., Agricultural Economics, "The Role of Auction Revenue Rights in Markets for Financial Transmission Rights," 2019.

Marco Velastegui, Ph.D., Agricultural Economics, "The Integration of Solar Generation on a Power System: Operational and Economic Evaluation," 2018.

Hyungkwan (James) Kim, Ph.D., Agricultural Economics, "Welfare Impacts of Optimal Virtual Bidding in a Multi-Settlement Electricity Market with Transmission Line Congestion," 2018.

Sayanti Mukhopadhyay, Ph.D., Civil Engineering, "Towards a Resilient Grid: A Risk-Based Decision Analysis Incorporating the Impacts of Severe Weather-Induced Power Outages," 2017.

Juan Giraldo, Ph.D., Agricultural Economics, "Welfare Impacts of Virtual Trading on Wholesale Electricity Markets," 2017.

Liwei Lu, Ph.D., Agricultural Economics, "An Assessment of the Efficacy and Cost of Alternative Carbon Mitigation Policies for the State of Indiana," 2015.

Juan Giraldo, M.S., Agricultural Economics, "An Economic Analysis of the Electricity Generation Potential from Biogas Resources in the State of Indiana," 2013.

Clay Davis, Ph.D., Agricultural Economics, "Three Essays on the Effect of Wind Generation on Power System Planning and Operations," 2013.

Benjamin Allen, M.S., Agricultural Economics, "An Economic and Emissions Analysis of Electricity Generation Using Biomass Feedstock in Co-fired and Direct Fired Facilities," 2011.

Samuel Brown, M.S., Agricultural Economics, "Rural Electric Cooperatives' Adoption of Renewable Energy Technologies, 2010.

Devendra Canchi, Ph.D., Agricultural Economics, "Financial Transmission Rights Valuation and Auction Structure," 2010.

Monique Fahie, M.S., Agricultural Economics, "Cap-and-trade Policy: The Influence on Investments in CO2 Reducing Technologies in Indiana," 2010.

Suriya Ruangpattana, Ph.D., Industrial Engineering, "Analysis of Load Factor for Fuel Diversification," 2010.

Liwei Lu, M.S., Agricultural Economics, "Assessment of the Reliability of Indiana's Electricity Generation System," 2009.

Veeradech Siriariyaporn, Ph.D., Industrial Engineering, "Reducing the Cost of Serving Uncertain Loads Via the Portfolio of Supply Contracts," 2005.

Ramu Naidoo, Ph.D., Industrial Engineering, "Planning Models for Electricity Transmission Network Expansion," 2004.

BOOK CHAPTERS

Gotham, D. J.; Angel, J. R.; Pryor, S. C., "Vulnerability of the Electricity and Water Sectors to Climate Change in the Midwest," in the book *Climate change impacts, risks, vulnerability and adaptation in the Midwestern United States*, 2012, Indiana University Press.

REFEREED JOURNAL PUBLICATIONS

Atkinson, T.; Preckel, P.; Gotham, D., "Costs and Trade-offs Associated with Renewable Energy Policies for Small Island Developing States: Case Study for Jamaica," *Socio-Economic Planning Sciences*, v. 84, December 2022.

Opgrand, J.; Preckel, P.; Gotham, D.; Liu, A., "Price Formation in Auctions for Financial Transmission Rights, *The Energy Journal*, v. 43, No. 3, May 2022.

Carvalho, J.; Bieler, S.; Collins, M.; Mueller, J.; Gehbauer, C.; Gotham, D.; Larsen, P., "A Framework to Measure the Technical, Economic, and Rate Impacts of Distributed Solar, Electric Vehicles, and Storage," *Applied Energy*, v. 297, September 2021.

Atkinson, T.; Preckel, P.; Gotham, D., "A Mathematical Formulation for Long-Term Infrastructure in Small Island Developing States," *MethodsX*, v. 8, September 2021.

Atkinson, T.; Preckel, P.; Gotham, D., "Long-Term Investment Planning for the Electricity Sector in Small Island Developing States: Case Study for Jamaica," *Energy*, v. 228, August 2021.

Raymond, L.; Gotham, D.; McClain, W.; Mukherjee, S.; Nateghi, R.; Preckel, P.; Schubert, P.; Singh, S.; Wachs, E., "Projected Climate Change Impacts on Indiana's Energy Demand and Supply," *Climatic Change*, Special Issue on "The Indiana Climate Change Impacts Assessment," pp. 1-15, January 2019.

Lu, L.; Preckel, P.; Gotham, D.; Liu, A., "An Assessment of the Efficacy and Cost of Alternative Carbon Mitigation Policies: Case Study for the State of Indiana," *Energy Policy*, v. 96, pp. 661-672, September 2016.

Davis, C. D.; Gotham, D. J.; Preckel, P. V.; Liu, A., "Determining the Impact of Wind on System Costs via the Temporal Patterns of Load and Wind Generation," *Energy Policy*, v. 60, pp. 122-131, September 2013.

Ruangpattana, S.; Preckel, P.; Gotham, D.; Muthuraman, K.; Velastegui, M.; Morin, T.; Uhan, N., "Diversification of Fuel Costs Accounting for Load Variation," *Energy Policy*, v. 42, pp. 400-408, March 2012.

Sparrow, F. T.; Preckel, P. V.; Bowen, B. H.; Yu, Z.; Gotham, D. J., "Regional Electricity Markets and the Cost of Natural Flow Dam Operation," *Energy Systems*, v. 2, No. 3-4, pp.325-357, November 2011.

Gotham, D.; Muthuraman, K.; Preckel, P.; Rardin, R.; Ruangpattana, S., "A Load Factor Based Mean-Variance Analysis for Fuel Diversification," *Energy Economics*, v. 31, No. 2, pp. 249-256, March 2009.

Gotham, D. J.; Holland, F. D.; Nderitu D. G. "The Projected Impacts of NO_x Emissions Reductions on Electricity Prices: A Case Study for the State of Indiana." *Utilities Policy*, v. 9, No. 2, June 2000.

Gotham, D. J. and Heydt G. T. "Power Flow Control in Systems with FACTS Devices." *Journal of Electric Machines and Power Systems*, v. 26, No. 9, pp. 951-962, November 1998.

Gotham, D. J. and Heydt G. T. "Steady State Power Flow Control and Power Flow Studies for Systems with FACTS Devices." *IEEE Transactions on Power Systems*, v. 13, No. 1, pp. 60-65, February 1998.

CONFERENCE PROCEEDINGS

Atkinson, T.; Preckel, P.; Gotham, D., "Long-Term Investment Planning for the Electricity Sector in Small Island Developing States: Case Study for Jamaica," 37th United States Association for Energy Economics/International Association for Energy Economics (USAEE/IAEE) Conference, Denver, CO, November 2019.

Opgrand, J.; Preckel, P.; Gotham, D.; Liu, A., "Conflicts of Interest in Auctions for Financial Transmission Rights," 36th United States Association for Energy Economics/International

Association for Energy Economics (USAEE/IAEE) Conference, Washington, DC, September 23-26, 2018.

Kim, H.; Preckel, P.; Gotham, D.; Liu, A., "Welfare Impacts of Optimal Virtual Bidding in a Multi-Settlement Electricity Market with Transmission Line Congestion," Agricultural and Applied Economics Association 2018 Annual Meeting, Washington, DC, August 5-7, 2018.

Kim, H.; Preckel, P.; Gotham, D.; Eales, J., "Impact Assessment of Time-of-Use Pricing: Evidence from a Natural Experiment in Ontario," Agricultural and Applied Economics Association 2015 Annual Meeting, San Francisco, CA, July 26-28, 2015.

Canchi, D.; Preckel, P. V.; Gotham, D. J.; Sparrow, F. T., "Easy Money in FTR Auctions," Agricultural and Applied Economics Association 2010 Annual Meeting, Denver, CO, July 25-27, 2010.

Lu, L.; Preckel, P.; Gotham, D., "Assessment of the Reliability of Indiana's Electricity Generation System," *Proceedings of the 41st Annual North American Power Symposium*, Mississippi State University, Starkville, MS, October 4-6, 2009.

Preckel, P. V.; Sparrow, F. T.; Bowen, B. H.; Yu, Z.; Gotham, D. J., "Preserving Low Cost Electricity While Improving the Riverine Environment: Part Two – Model Results," 2009 IEEE Power Engineering Society General Meeting, July 26-30, 2009.

Preckel, P. V.; Sparrow, F. T.; Bowen, B. H.; Yu, Z.; Gotham, D. J.; Yang, Z., "Preserving Low Cost Electricity While Improving the Riverine Environment: A Case Study of Ghana's Akosomobo Dam Complex," 2008 IEEE Power Engineering Society General Meeting, July 20-24, 2008.

Ruangpattana, S.; Gotham, D.; Muthuraman, K.; Preckel, P.; Rardin, R., "Applying Load Factors to the Mean-Variance Analysis for Fuel Diversification," *The 10th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS 2008)*, May 25-29, 2008, Rincon, PR.

Gotham, D.; Muthuraman, K.; Rardin, R.; Ruangpattana, S., "A Load Factor Based Mean-Variance Analysis for Fuel Diversification," Third Annual Carnegie Mellon Electricity Conference, March 13-14, 2007, Pittsburgh, PA.

Siriariyaporn, V.; Sparrow, F. T.; Gotham, D. J., "A Two-Stage Stochastic Unit Commitment with Electricity Derivatives," *The Proceedings of the 38th Annual North American Power Symposium*, September 17-19, 2006, Carbondale, IL.

Siriariyaporn, V.; Sparrow, F. T.; Gotham, D. J., "Modeling Power Portfolio with Supply Contracts for Mitigating Risks of Serving Uncertain Demand," *The 9th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS 2006)*, June 11-15, 2006, Stockholm, Sweden.

Siriariyaporn, V.; Gotham, D.; Sparrow, F. T., "Determining the Cost of Uncertainty to Electric Utilities in Serving Highly Varying Loads," *The Proceedings of the 2nd IEEE Conference on Electric Utility Deregulation, Restructuring, and Power Technologies*, v. 2, pp. 580-585, April 5-8, 2004, Hong Kong.

Rardin R. L.; Naidoo, R.; Ong, C. M.; Sparrow, F. T.; Gotham, D.; Yu, Z., "Multi-Period Electric Transmission Expansion Using AC Power Flow Equations," *Institute for Operations Research and the Management Sciences Annual Meeting (INFORMS)*, October 24-27, 2004, Denver, CO.

Siriariyaporn, V.; Gotham, D. J.; Kramer, R. A.; Sparrow, F. T., "Measuring the Cost of Providing the Regulation Ancillary Service with Highly Varying Loads," *The Proceedings of the 34th Annual North American Power Symposium*, October 14-15, 2002, Tempe, AZ.

Nderitu, D. G.; Yu, Z.; Gotham, D. J.; Sparrow, F. T., "Quantifying the Benefits of Distributed Generation in Imperfectly Competitive Electricity Markets," *Proceedings of the Power System 2002 Conference: Impact of Distributed Generation*, March 13-15, 2002, Clemson, SC.

Yu, Z.; Sparrow, F. T.; Gotham, D. J.; Holland, F. D.; Nderitu, D. G.; Morin, T. L., "The Impact of Transmission on Imperfect Electricity Competition," *Proceedings of the IEEE Power Engineering Society Winter Meeting*, January 27-31, 2002, New York, NY.

Yu, Z.; Sparrow, F. T.; Gotham, D. J.; Holland, F. D.; Nderitu, D. G.; Morin, T. L., "A Large Oligopoly Competition Model with an Application to the Midwest Electricity Markets," *Proceedings of the IEEE Power Engineering Society Summer Meeting*, July 15-19, 2001, Vancouver, BC.

Yu, Z.; Sparrow, F. T.; Gotham, D. J., "Evaluating the Effect of Mergers on Deregulated Electricity Markets," *Proceedings of the Conference on Large Engineering Systems - Power Engineering, 2001*, July 2001, Halifax, NS.

Yu, Z.; Nderitu, D. G.; Sparrow, F. T.; Gotham, D. J., "Optimal and Reliable Dispatch of Supply and Demand Bids for Competitive Electricity Markets," *Proceedings of the IEEE Power Engineering Society Summer Meeting*, July 16-20, 2000, Seattle, WA.

Sparrow, F. T.; Yu, Z.; Gotham, D. J.; Bowen, B. H.; Nderitu, G.; Wang, J.; Smardo, F. J.; Stamber, K., "A Multi-Regional Electricity Trade Study for the Southern African Power Pool," *Proceedings of the American Power Conference, 60th Annual Meeting, April 14-16, 1998*, Chicago, IL, Vol. 60, pp. 715-720.

Yu, Z.; Sparrow, F. T.; Gotham, D. J.; Gupta, R., "A Linear Mixed Integer Formulation of Multi-Area Energy Production Simulation with Unconditional Constraints," *Proceedings of the American Power Conference, 59th Annual Meeting, April 1-3, 1997*, Chicago, IL, Vol. 59-I, pp. 365-370.

Gotham, D. J. and Heydt G. T., "FACTS Device Models for Power Flow Studies," *The Proceedings of the 27th Annual North American Power Symposium, October 2-3, 1995*, Montana State University, Bozeman, MT, pp. 514-519.

Gotham, D. J. and Heydt G. T., "The Response of Systems under AGC Using Load Forecasting Information," *The Proceedings of the 26th Annual North American Power Symposium, September 26-27, 1994*, Kansas State University, Manhattan, KS, pp. 508-516.

TECHNICAL & STAFF REPORTS

Phillips, T.; Velastegui, M.; Gotham, D.; Kain, A.; Lu, L.; Nderitu, D.; and Fate, C., "Indiana Electricity Projections: The 2023 Forecast," prepared for the Indiana Utility Regulatory Commission, December 2023.

Nderitu, D.; Gotham, D.; Fate, C. T.; Kain, A.; Lu, L.; Phillips, T.; and Velastegui, M., "2023 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, September 2023.

Lu, L.; Kain, A.; Gotham, D.; Nderitu, D.; Phillips, T.; and Velastegui, M., “2022 MISO Energy and Peak Demand Forecasting for System Planning,” prepared for the Midcontinent Independent System Operator, November 2022.

Nderitu, D.; Gotham, D.; Fate, C. T.; Kain, A.; Lu, L.; Phillips, T.; and Velastegui, M., “2022 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, October 2022.

Phillips, T.; Velastegui, M.; Gotham, D.; Kain, A.; Lu, L.; Nderitu, D.; and Fate, C., “Indiana Electricity Projections: The 2021 Forecast,” prepared for the Indiana Utility Regulatory Commission, December 2021.

Lu, L.; Kain, A.; Gotham, D.; Nderitu, D.; Phillips, T.; and Velastegui, M., “2021 MISO Energy and Peak Demand Forecasting for System Planning,” prepared for the Midcontinent Independent System Operator, November 2021.

Nderitu, D.; Gotham, D.; Kain, A.; Lu, L.; Mize, D.; Phillips, T.; and Velastegui, M., “2021 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, October 2021.

Lu, L.; Wu, F.; Gotham, D.; Nderitu, D.; Phillips, T.; Preckel, P.; and Velastegui, M. A., “2020 MISO Energy and Peak Demand Forecasting for System Planning,” prepared for the Midcontinent Independent System Operator, November 2020.

Nderitu, D.; Gotham, D.; Lu, L.; Mize, D.; Phillips, T.; Preckel, P.; and Velastegui, M., “2020 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, October 2020.

Indiana Utility Regulatory Commission; Midcontinent Independent System Operator; Indianapolis Power & Light; State Utility Forecasting Group; and Lawrence Berkeley National Lab, “Solar Distributed Energy Resources (DER) Report,” September 2020.

State Utility Forecasting Group, “Scenario Analyses for IURC Report to the 21st Century Energy Policy Task Force,” prepared for the Indiana Utility Regulatory Commission, May 2020.

Phillips, T.; Velastegui, M.; Gotham, D.; Lu, L.; Wu, F.; Nderitu, D.; Preckel, P.; and Mize, D., “Indiana Electricity Projections: The 2019 Forecast,” prepared for the Indiana Utility Regulatory Commission, November 2019.

Gotham, D. J.; Lu, L.; Wu, F.; Nderitu, D.; Phillips, T. A.; Preckel, P. V.; and Velastegui, M. A., “2019 MISO Energy and Peak Demand Forecasting for System Planning,” prepared for the Midcontinent Independent System Operator, November 2019.

Nderitu, D.; Gotham, D.; Lu, L.; Mize, D.; Phillips, T.; Preckel, P.; Velastegui, M.; and Wu, F., “2019 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, September 2019.

Raymond, L.; Gotham, D.; McClain, W.; Mukhopadhyay, S.; Nateghi, R.; Preckel, P.; Schubert, P.; Singh, S.; Wachs, L.; Widhalm, M.; and Dukes, J., “Climate Change and Indiana’s Energy

Sector: A Report from the Indiana Climate Change Impacts Assessment,” Energy Reports, February 2019.

Gotham, D. J.; Lu, L.; Wu, F.; Nderitu, D.; Phillips, T. A.; Preckel, P. V.; and Velastegui, M. A., “MISO Energy and Peak Demand Forecasting for System Planning,” prepared for the Midcontinent Independent System Operator, November 2018.

State Utility Forecasting Group, “Indiana Electricity Projections: The 2018 Forecast Update,” prepared for the Indiana Utility Regulatory Commission, October 2018.

Nderitu, D.; Gotham, D.; Lu, L.; Mize, D.; Phillips, T.; Preckel, P.; Velastegui, M.; and Wu, F., “2018 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, October 2018.

Phillips, T.; Velastegui, M.; Gotham, D.; Lu, L.; Wu, F.; Nderitu, D.; Preckel, P.; and Mize, D., “Indiana Electricity Projections: The 2017 Forecast,” prepared for the Indiana Utility Regulatory Commission, December 2017.

Gotham, D. J.; Lu, L.; Wu, F.; Phillips, T. A.; Preckel, P. V.; and Velastegui, M. A., “MISO Independent Load Forecast Update,” prepared for the Midcontinent Independent System Operator, November 2017.

Nderitu, D.; Gotham, D.; Lu, L.; Mize, D.; Phillips, T.; Preckel, P.; Velastegui, M.; and Wu, F., “2017 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, October 2017.

State Utility Forecasting Group, “Natural Gas Price Report Update,” March 2017.

Gotham, D. J.; Lu, L.; Wu, F.; Phillips, T. A.; Preckel, P. V.; and Velastegui, M. A., “2016 MISO Independent Load Forecast,” prepared for the Midcontinent Independent System Operator, November 2016.

Nderitu, D.; Song, J.; Gotham, D.; Lu, L.; Mize, D.; Phillips, T.; Preckel, P.; Velastegui, M.; and Wu, F., “2016 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, September 2016.

Phillips, T.; Velastegui, M.; Gotham, D.; Lu, L.; Nderitu, D.; Preckel, P.; Wu, F.; and Mize, D., “Indiana Electricity Projections: The 2015 Forecast,” prepared for the Indiana Utility Regulatory Commission, November 2015.

Gotham, D. J.; Lu, L.; Wu, F.; Phillips, T. A.; Preckel, P. V.; and Velastegui, M. A., “2015 MISO Independent Load Forecast,” prepared for the Midcontinent Independent System Operator, November 2015.

Nderitu, D.; Gotham, D.; Mize, D.; Phillips, T.; Preckel, P.; Velastegui, M.; Wu, F.; and Lu, L., “2015 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Interim Study Committee on Energy, Utilities, and Telecommunication of the Indiana General Assembly, September 2015.

State Utility Forecasting Group, “Electricity and Natural Gas Price Forecast Methodology 2015,” prepared for the Mid-Continent Independent System Operator, July 2015.

State Utility Forecasting Group, "Forecast Band Methodology," prepared for the Mid-Continent Independent System Operator, July 2015.

Hadley, S. W.; Gotham, D. J.; and Luciani, R. L., "Additional EIPC Study Analysis: Final Report," Oak Ridge National Laboratory report ORNL/TM-2014/480, December 2014.

Gotham, D. J.; Phillips, T. A.; Velastegui, M. A.; Wu, F.; Giraldo, J. S.; and Preckel, P. V., "2014 MISO Independent Load Forecast," prepared for the Midcontinent Independent System Operator, November 2014.

Nderitu, D.; Gotham, D.; Mize, D.; Phillips, T.; Preckel, P.; Velastegui, M.; Wu, F.; and Young, J., "2014 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2014.

State Utility Forecasting Group, "Independent Load Forecast Results," prepared for the Mid-Continent Independent System Operator, September 2014.

State Utility Forecasting Group, "Growth Rates for State Level Forecast Drivers," prepared for the Mid-Continent Independent System Operator, July 2014.

State Utility Forecasting Group, "State Electricity Price Forecasting Model Summary," prepared for the Mid-Continent Independent System Operator, July 2014.

State Utility Forecasting Group, "MISO Allocation Factors: State Level and MISO Local Resource Zone," prepared for the Mid-Continent Independent System Operator, July 2014.

State Utility Forecasting Group, "MISO LRZ Annual Energy to Summer/Winter Peak Demand Conversion Factors," prepared for the Midcontinent Independent System Operator, July 2014.

Nderitu, D. G.; Preckel, P. V.; Gotham, D. J.; and Dobis, E. A., "Assessment of the National Prospects for Electricity Generation from Biomass," prepared for the US Department of Agriculture, April 2014.

Hadley, S. W.; and Gotham, D. J., "Additional EIPC Study Analysis: Interim Report on Medium Priority Topics," Oak Ridge National Laboratory report ORNL/TM-2013/561, March 2014.

Phillips, T.; Velastegui, M.; Gotham, D.; Nderitu, D.; Preckel, P.; and Mize, D., "Indiana Electricity Projections: The 2013 Forecast," prepared for the Indiana Utility Regulatory Commission, December 2013.

Gotham, D.; Nderitu, D.; Giraldo, J.; and Preckel, P., "Natural Gas Market Study," prepared for the Indiana General Assembly and the Indiana Utility Regulatory Commission, November 2013.

Nderitu, D.; Carnegie, R.; Gotham, D.; Preckel, P.; Mize, D.; Velastegui, M.; and Phillips, T., "2013 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2013.

Davis, C.; Gotham, D.; and Preckel, P., "Valuation of Energy Storage with Wind Generation," August 2013.

Giraldo, J.; Preckel, P.; and Gotham, D., "An Assessment of the Potential for Electricity Generation in Indiana from Biogas Resources," June 2013.

Carnegie, R.; Gotham, D.; Nderitu, D.; and Preckel, P., "Utility Scale Energy Storage Systems: Benefits, Applications, and Technologies," June 2013.

Davis, C.; Gotham, D.; and Preckel, P., "The Impact of Wind on Electricity Generation Costs in Indiana," June 2013.

Giraldo, J.; Gotham, D.; Nderitu, D.; Preckel, P.; and Mize, D., "Fundamentals of Nuclear Power," prepared for the Indiana Utility Regulatory Commission, December 2012.

Nderitu, D.; Ozkaya, E.; Gotham, D.; Preckel, P.; Mize, D.; Velastegui, M.; and Phillips, T., "2012 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2012.

State Utility Forecasting Group, "Statewide Database of Energy Efficiency Efforts in Indiana: 2011," prepared for the Indiana Office of Energy Development, June 2012.

Velastegui, M.; Gotham, D.; Phillips, T.; Preckel, P.; and Nderitu, D., "The Impacts of Federal Environmental Regulations on Indiana Electricity Prices," prepared for the Indiana Utility Regulatory Commission, January 2012.

State Utility Forecasting Group, "Statewide Database of Energy Efficiency Efforts in Indiana: 2010," prepared for the Indiana Office of Energy Development, January 2012.

Holland, F.; Velastegui, M.; Gotham, D.; Nderitu, D.; Preckel, P.; Phillips, T.; and Mize, D., "Indiana Electricity Projections: The 2011 Forecast," prepared for the Indiana Utility Regulatory Commission, September 2011.

Nderitu, D.; Ji, T.; Allen, B.; Gotham, D.; Preckel, P.; Mize, D.; Holland, F.; Velastegui, M.; and Phillips, T., "2011 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2011.

Brown, S.; Nderitu, D.; Preckel, P.; Gotham, D.; and Allen, B., "Renewable Power Opportunities for Rural Communities," prepared for the US Department of Agriculture, April 2011.

Velastegui, M.; Gotham, D.; Preckel, P.; Nderitu, D.; and Holland, F., "Wind Generation's Contribution to the Management of Average Cost and Cost Volatility for Indiana," March 2011.

Davis, C.; Gotham, D.; and Preckel, P., "Determining the Impact of Wind on System Costs via the Temporal Patterns of Load and Wind Generation," March 2011.

Nderitu, D.; Allen, B.; Gotham, D.; Holland, F.; Velastegui, M.; and Preckel, P., "2010 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2010.

Holland, F.; Velastegui, M.; Gotham, D.; Nderitu, D.; and Preckel, P., "Indiana Electricity Projections: The 2009 Forecast," prepared for the Indiana Utility Regulatory Commission, December 2009.

Nderitu, D.; Gall, E.; Gotham, D.; Holland, F.; Velastegui, M.; and Preckel, P., "2009 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2009.

Holland, F.; Agarwal, V.; Gotham, D.; and Preckel P., "Electricity Sales Projections for the State of Mississippi," research report, State Utility Forecasting Group, Purdue University, West Lafayette, Indiana, October 2008.

Nderitu, D.; Agrawal, M.; Gotham, D.; Holland, F.; and Preckel, P., "2008 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2008.

Gotham, D.; Holland, F.; Nderitu, D.; Preckel, P.; Raymond, L.; Shively, G.; and Yu, Z., "The Projected Impacts of Carbon Dioxide Emissions Reduction Legislation on Electricity Prices in Indiana," February 2008.

Gotham, D.; Holland, F.; Nderitu, D.; Preckel, P.; and Yu, Z., "Indiana Electricity Projections: The 2007 Forecast," prepared for the Indiana Utility Regulatory Commission, December 2007.

Gotham, D.; Holland, F.; Madore, W.; Nderitu, D.; Preckel, P.; and Yu, Z., "2007 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana General Assembly, September 2007.

State Utility Forecasting Group, "Energy Trends Report," prepared for the Indiana Utility Regulatory Commission, July 2007.

State Utility Forecasting Group, "Clean Coal Technologies," prepared for the Indiana Utility Regulatory Commission, June 2007.

Gotham, D.; Nderitu, D.; Facetti, G.; Holland, F.; Rardin, R.; and Yu, Z., "2006 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana Legislature, September 2006.

State Utility Forecasting Group, "The Projected Impacts of Mercury Emissions Reductions on Electricity Prices in Indiana," prepared for the Indiana Utility Regulatory Commission and the Indiana Department of Environmental Management, September 2006.

State Utility Forecasting Group, "The Projected Impacts of the Clean Air Interstate Rule on Electricity Prices in Indiana," prepared for the Indiana Utility Regulatory Commission and the Indiana Department of Environmental Management, March 2006.

Rardin, R. L.; Gotham, D. J.; Holland, F. D.; Yu, Z.; Nderitu, D. G.; and Thomas, A. D., "Indiana Electricity Projections: The 2005 Forecast," prepared for the Indiana Utility Regulatory Commission, December 2005.

Rardin, R. L.; Gotham, D. J.; Holland, F. D.; Yu, Z.; Nderitu, D. G.; and Thomas, A. D., "Indiana Electricity Projections: The 2005 Forecast Summary," prepared for the Indiana Utility Regulatory Commission, December 2005.

State Utility Forecasting Group, "2005 Indiana Renewable Energy Resources Study," prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana Legislature, September 2005.

State Utility Forecasting Group, "Natural Gas Purchase Incentive Regulation and Benchmarking," prepared for the Indiana Utility Regulatory Commission, July 2005.

Stamber, K. L.; Boyd, G. A.; Flaim, S. J.; Folga, S. M.; Gotham, D. J.; McLamore, M. R.; Novak, M. H.; Roop, J. M.; Rossmann, C. G.; Shamsuddin, S. A.; and Zeichner, L. M., "Economics in

Criticality and Restoration of Energy Infrastructures,” Sandia National Laboratory Report SAND 2005-1926, March 2005.

State Utility Forecasting Group, “2004 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana Legislature, September 2004.

Bowen, B. H.; Holland, F. D.; Sparrow, F. T.; Rardin, R. L.; Gotham, D. J.; Yu, Z.; and Black, A. F., “Expanding the Utilization of Indiana Coals,” prepared for the Center for Coal Technology Research, August 2004; revised August 2008.

State Utility Forecasting Group, “Comparison of Distributed Generation Interconnection Rules in California, Delaware, Michigan, New York, Ohio, Texas and Wisconsin,” prepared for the Indiana Utility Regulatory Commission, July 2004.

Sparrow, F. T.; Gotham, D. J.; Nderitu, D. G.; and Siriariyaporn, V., “The Economic Impact of Integrating Multiple Distributed Generators into Modern Distribution Systems,” Final report prepared for the National Renewable Energy Laboratory and Nisource Energy Technologies, December 2003.

Sparrow, F. T.; Gotham, D. J.; Holland, F. D.; Yu, Z.; Nderitu, D. G.; Bridwell, P. M.; and Green, R. J., “Indiana Electricity Projections: The 2003 Forecast,” prepared for the Indiana Utility Regulatory Commission, September 2003.

Sparrow, F. T.; Gotham, D. J.; Holland, F. D.; Yu, Z.; Nderitu, D. G.; Bridwell, P. M.; and Green, R. J., “Indiana Electricity Projections: The 2003 Forecast Summary,” prepared for the Indiana Utility Regulatory Commission, September 2003.

Rardin, R.; Naidoo, R.; Gotham, D.; Holland, F.; Yu, Z.; Nderitu, D. G.; and Bridwell, P. M., “2003 Indiana Renewable Energy Resources Study,” prepared for the Indiana Utility Regulatory Commission and the Regulatory Flexibility Committee of the Indiana Legislature, September 2003.

State Utility Forecasting Group, “Indiana Natural Gas Modeling System: A Technical Report,” prepared for the Indiana Utility Regulatory Commission, June 2003.

State Utility Forecasting Group, “Indiana Electricity Projections: The 2002 Forecast Update,” prepared for the Indiana Utility Regulatory Commission, July 2002.

Gotham, D. J.; Sparrow, F. T.; Siriariyaporn, V.; and Nderitu, D. G., Status Report for Year 2 of the Project “Enhancing the Operation of Highly Varying Loads to Increase Electric Reliability, Quality, and Economics,” prepared for the U.S. Department of Energy and Northern Indiana Public Service Company, January 2002.

State Utility Forecasting Group, “Sufficiency of Indiana Generating Capacity in NO_x Retrofit Outage Periods,” prepared for the Indiana Utility Regulatory Commission, November 2001.

Sparrow, F. T.; Holland, F. D.; Gotham, D. J.; Yu, Z.; and Bridwell, P. M., “Indiana Electricity Projections: The 2001 Forecast,” prepared for the Indiana Utility Regulatory Commission, November 2001.

Sparrow, F. T.; Holland, F. D.; Gotham, D. J.; Yu, Z.; and Bridwell, P. M., “Indiana Electricity Projections: The 2001 Forecast Summary,” prepared for the Indiana Utility Regulatory Commission, November 2001.

Sparrow, F. T.; Gotham, D. J.; Holland, F. D.; Yu, Z.; Nderitu, D. G.; and Bridwell, P. M., "Factors Affecting Indiana Electricity Prices in Competitive Markets," prepared for the Indiana Utility Regulatory Commission, November 2001.

Gotham, D. J.; Sparrow, F. T.; and Siriariyaporn, V., Status Report for Year 1 of the Project "Enhancing the Operation of Highly Varying Loads to Increase Electric Reliability, Quality, and Economics," prepared for the U.S. Department of Energy and Northern Indiana Public Service Company, January 2001.

State Utility Forecasting Group, "The Projected Impacts of NO_x Emissions Reductions on Electricity Prices in Indiana," prepared for the Indiana Utility Regulatory Commission and the Indiana Department of Environmental Management, June 2000.

Sparrow, F. T.; Holland, F. D.; Gotham, D. J.; Yu, Z.; and Bridwell, P. M., "Indiana Electricity Projections: The 1999 Forecast," prepared for the Indiana Utility Regulatory Commission, October 1999.

Sparrow, F. T.; Holland, F. D.; Gotham, D. J.; Yu, Z.; and Bridwell, P. M., "Indiana Electricity Projections: The 1999 Forecast Summary," prepared for the Indiana Utility Regulatory Commission, October 1999.

Sparrow, F. T.; Holland, F. D.; Gotham, D. J.; Yu, Z.; and Sanders, P. M., "The Projected Impact of Restructuring on Indiana Electricity Prices: An Interim Report," prepared for the Indiana Utility Regulatory Commission, May 1998.

Robinson, P. B.; Sparrow, F. T.; and Gotham, D. J., "Wheeling Charges and Loose Power Pools: North American Experience and its Relevance for the Southern Africa Power Pool," prepared for the Sixth Joint Plenary Session of the Southern Africa Power Pool Meetings, May 13, 1997, Harare, Zimbabwe.

Sparrow, F. T.; Gunel, I.; Holland, F. D.; Gotham, D. J.; Yu, Z.; Sanders, P. M.; Stamber, K. L.; and McKinzie, L. D., "The 1996 Indiana Electricity Projections," prepared for the Indiana Utility Regulatory Commission, October 1996.

Sparrow, F. T.; Gunel, I.; Holland, F. D.; Gotham, D. J.; Yu, Z.; Sanders, P. M.; Stamber, K. L.; and McKinzie, L. D., "The 1996 Indiana Electricity Projections: An Executive Summary," prepared for the Indiana Utility Regulatory Commission, October 1996.

Sparrow, F. T.; Cearley, R. W.; Holland, F. D.; McKinzie, L. D.; Gotham, D. J.; Lee, J. S.; and Frye, E., "The 1994 Indiana Electricity Projections," prepared for the Indiana Utility Regulatory Commission, May 1995.

Sparrow, F. T.; Cearley, R. W.; Holland, F. D.; McKinzie, L. D.; Gotham, D. J.; Lee, J. S.; and Frye, E., "The 1994 Indiana Electricity Projections: Executive Summary," prepared for the Indiana Utility Regulatory Commission, May 1995.

Alyasin, S.; Chung, L.; Gotham, D.; Hu, D.; Kwon, B.; Lee, J.; Mok, A.; Risal, A.; and Sasaki, R., "Selected Topics on Demand-Side Management," TR-EE 94-14. Published by the School of Electrical Engineering, Purdue University, West Lafayette, IN, May 1994.

Sparrow, F. T.; Cearley, R. W.; Holland, F. D.; McKinzie, L. D.; Gotham, D. J.; and Lee, J. S., "Indiana Electricity Demand: The 1993 Forecast," prepared for the Indiana Utility Regulatory Commission, June 1993.

Sparrow, F. T.; Cearley, R. W.; Holland, F. D.; McKinzie, L. D.; Gotham, D. J.; and Lee, J. S., "Indiana Electricity Demand: Technical Appendix," prepared for the Indiana Utility Regulatory Commission, June 1993.

Sparrow, F. T.; Cearley, R. W.; Holland, F. D.; McKinzie, L. D.; Gotham, D. J.; and Lee, J. S., "Indiana Electricity Demand: An Executive Summary," prepared for the Indiana Utility Regulatory Commission, June 1993.

Benedict, E.; Collins, T.; Gotham, D.; Hoffman, S.; Karapides, D.; Pekarek, S.; and Ramabhadran, R., "Losses in Electric Power Systems," TR-EE 92-54. Published by the School of Electrical Engineering, Purdue University, West Lafayette, IN, December 1992.

CONFERENCE POSTER SESSIONS

Opgrand, J.; Liu, A.; Preckel, P.; Gotham, D., "Assessing Alternative Market Design Proposals for Financial Transmission Rights," 36th United States Association for Energy Economics/International Association for Energy Economics (USAEE/IAEE) Conference, Washington, DC, September 2018.

Kim, H.; Liu, A.; Preckel, P.; Gotham, D., "Welfare Impacts of Optimal Virtual Bidding in a Multi-Settlement Electricity Market with Transmission Line Congestion," 2018 Agricultural & Applied Economics Association Annual Meeting, Washington, DC, August 2018.

Kim, H.; Liu, A.; Preckel, P.; Gotham, D., "Welfare Impacts of Optimal Virtual Bidding in a Multi-Settlement Electricity Market with Transmission Line Congestion," 35th United States Association for Energy Economics/International Association for Energy Economics (USAEE/IAEE) Conference, Houston, TX, November 2017, Winner of the Houston Student Poster Session Competition; also presented at the Heartland Environmental & Resource Economics Workshop at Illinois, Urbana-Champaign, IL, September 2017.

REGULATORY AND CONFERENCE PRESENTATIONS

"Methods for Forecasting Electricity Demand," Indiana Society of Professional Engineers Annual Conference, Carmel, IN, June 2022.

"SUGF Indiana Forecasting Modeling System," IURC State Impacts Assessment Stakeholder Meeting, Indianapolis, IN, August 2019.

"Impacts of PEVs on Utility Planning," Sustainable Electrified Transportation Center 3rd Annual Meeting & Technology Showcase, West Lafayette, IN, October 2018.

"The Ever Shifting Generation Mix," 2018 Indiana Energy Conference, Indianapolis, IN, October 2018.

"Is the Recent Trend of Little to No Load Growth an Indication of the Next 20 Years?" 2018 IRP Contemporary Issues Technical Conference, Indianapolis, IN, April 2018.

"Policy Cents: How and Why State Energy Plans Affect Your Bottom Line and Resource Planning," 2017 Indiana Conference on Energy Management, panel discussion, Indianapolis, IN, August 2017.

"Constructing Complex Scenario Analysis by Integrating Probabilistic Analysis," IRP Contemporary Issues Technical Conference, panel discussion, Indianapolis, IN, April 2017.

"Natural Gas Price Trends," 2017 IRP Contemporary Issues Technical Conference, Indianapolis, IN, April 2017.

"Risk vs. Uncertainty," 2017 IRP Contemporary Issues Technical Conference, Indianapolis, IN, April 2017.

"Constructing Complex Planning Analysis," IRP Contemporary Issues Technical Conference, panel discussion, Indianapolis, IN, March 2016.

"Indiana Electricity Projections: The 2015 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, December 2015.

"Load Forecasting Considerations," IRP Contemporary Issues Technical Conference, Indianapolis, IN, October 2014.

"Indiana Electricity Projections: The 2013 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, December 2013.

"The Evolution of Indiana's Supply and Demand for Energy," Indiana Conference on Energy Management, Indianapolis, IN, August 2013.

"Indiana Electricity Projections and Renewable Energy," 2012 Energy & Water Education Conference, Indianapolis, IN, May 2012.

"Indiana Energy Status: A View from 30,000 Feet," Indiana Conference on Energy Management, Indianapolis, IN, June 2010.

"Regional Electricity Forecasting," Michigan Forum on Economic Regulatory Policy, East Lansing, MI, January 2010.

"Indiana Electricity Projections: The 2009 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, December 2009.

"Powering the Future: A Forecast of Indiana's Electricity Consumption, Prices and Resource Requirements," Program on Law and State Government Fellowship Symposium, IUPUI Law School, Indianapolis, IN, October 2009.

"History and Functions of the State Utility Forecasting Group," Institute of Public Utilities, 6th Commission Executive Management Forum, East Lansing, MI, October 2008.

"Indiana Energy Status," Indiana Conference on Energy Management, Indianapolis, IN, June 2008.

"Impacts of CO2 Restrictions on Indiana Electricity Prices," Indiana Utility Regulatory Commission/Indiana Office of the Consumer Counselor, Indianapolis, IN, April 2008.

"Indiana Electricity Projections: The 2007 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, December 2007.

"Indiana Energy Status: A View from 30,000 Feet," Indiana Conference on Energy Management, Indianapolis, IN, July 2007.

"Indiana Energy Status: A View from 30,000 Feet," Indiana Conference on Energy Management, Indianapolis, IN, October 2006.

"Indiana Electricity Projections: The 2005 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, January 2006.

"Electricity and Natural Gas Linkages: A Forecasting Perspective," 36th Annual Regulatory Policy Conference, Institute of Public Utilities, Charleston, SC, December 2004.

"Indiana Electricity Projections: The 2003 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, September 2003.

"Indiana Natural Gas Modeling System: A Technical Report," the Indiana Utility Regulatory Commission Gas Price Forum, Indianapolis, IN, July 2003.

"Retirements, Repowering and New Construction: The Expected Impact on Coal and Natural Gas Demand," Indiana Coal Mining Institute Annual Conference, Evansville, IN, May 2002.

"Deregulation of the Electric Utilities: California Comparisons," Indiana Society of Mining and Reclamation 2001 Technology Transfer Seminar, Jasper, IN, December 2001.

"Indiana's Current and Future Energy Reserves," Indiana Energy Summit, Logansport, IN, June 2001.

"The Midwest Electricity Supply Situation," Wabash Valley Power Authority C & I Symposium, Kendallville, IN, May 2001.

"Midwest Market Power Monitoring," National Regulatory Research Institute Market Power Conference, Columbus, OH, April 2001.

"SUGF 2000 Studies on Electricity Restructuring," Indiana Utility Regulatory Commission, Indianapolis, IN, February 2001.

"State Utility Forecasting Group Forecasting Models and Data Requirements," Indiana Utility Regulatory Commission Reliability Proceeding (Session 5), Indianapolis, IN, October 2000.

"Summer 1999 Forecast," Indiana Industrial Energy Consumers 1999 Energy Workshop, Indianapolis, IN, May 1999.

"FACTS Device Models for Power Flow Studies," 27th Annual North American Power Symposium, Bozeman, MT, October 1995.

"The Response of Systems under AGC Using Load Forecasting Information," 26th Annual North American Power Symposium, Manhattan, KS, September 1994.

OTHER PRESENTATIONS AND SEMINARS

"Indiana Electricity Projections: The 2023 Forecast," Indiana Utility Regulatory Commission, Indianapolis, IN, December 2023.

"The Solar Industry: What Drives the Need for Renewable Energy? What Should Indiana Expect Over the Next 3-5 Years," Utility-Scale Solar Workshops for Community Leaders and Public Officials, Greencastle, IN and Franklin, IN, June 2023.

"U.S. Case Studies," Technical Workshop on Evaluating Demand Forecasts and Least-Cost Expansion Plans," Technical Workshop on Evaluating Demand Forecasts and Least-Cost Expansion Plans, Lusaka, Zambia, January 2023.

"Scenario Examples," Technical Workshop on Evaluating Demand Forecasts and Least-Cost Expansion Plans," Technical Workshop on Evaluating Demand Forecasts and Least-Cost Expansion Plans, Lusaka, Zambia, January 2023.

“The Value Proposition of Market Integration,” Southeast Europe Electricity Market Coupling (SEE-MC) Initiative, Athens, Greece, June 2022.

“Scenario Analyses for IURC Report to the 21st Century Energy Policy Task Force,” Indiana Society of Professional Engineers, (via teleconference), April 2021 and Michigan State University Institute of Public Utilities Office Hours (via teleconference), July 2021.

“Multi-regional Electricity Market Modeling,” Europe and Eurasia Initiative on Enhancing Market Performance Technical Workshop, Vienna, Austria, February 2020.

“Multi-regional Market Planning in the US,” Europe and Eurasia Initiative on Enhancing Market Performance Technical Workshop, Vienna, Austria, February 2020.

“Indiana’s Changing Generation Mix: Where We Were, Where We Are, and Where We Are Going,” Indiana Bar Association Utility Law Section Fall Seminar, Bloomington, IN, September 2019.

“System Forecasting for Energy Planning at MISO,” ACES 2019 MISO Summit, Indianapolis, IN, August 2019.

“Merging Load Forecasts,” MISO stakeholder teleconference, April 2019.

“Introduction to Electricity Markets,” National Conference of State Legislatures Electricity Markets and State Challenges Workshop, Indianapolis, IN, June 2018.

“Modeling Distributed Solar Adoption,” Indiana Bar Association Utility Law Section Fall Seminar, Bloomington, IN, October 2017.

“State Trends, Opportunities, and SUFG Modeling Methodology,” Lugar Center for Renewable Energy Annual Retreat, Indianapolis, IN, January 2017.

“Independent Load Forecast Update,” MISO Planning Advisory Committee Meeting (via teleconference), Metairie, LA, October 2016.

“Independent Load Forecast Workshop,” MISO ILF Stakeholder Workshop #4, Carmel, IN, September 2016.

“Independent Load Forecast Workshop,” MISO ILF Stakeholder Workshop #3, Eagan, MN, July 2016.

“2016 Independent Load Forecast Workshop #2,” MISO ILF Stakeholder Workshop #2, Carmel, IN, April 2016.

“2016 Independent Load Forecast Workshop #1,” MISO ILF Stakeholder Workshop #1, via teleconference, January 2016.

“Independent Load Forecast Update,” MISO Planning Advisory Committee Meeting, Metairie, LA, November 2015.

“What Can the “Water People” Learn from the Electricity Forecasters?” Indiana Water Forum, West Lafayette, IN, November 2015.

“Independent Load Forecast,” MISO Planning Advisory Committee Meeting (via teleconference), Little Rock, AR, October 2015.

“Independent Load Forecast Workshop,” MISO ILF Stakeholder Workshop #4, Carmel, IN, September 2015.

"Indiana's Electricity Sector," Indiana Farm Bureau Energy Policy Advisory Group, Indianapolis, IN, July 2015.

"MISO Independent Load Forecast Stakeholder Workshop," MISO ILF Stakeholder Workshop #3, Eagan, MN, July 2015.

"Effects of Climate Change on the Midwest Electricity Sector, Purdue Climate Change Research Center Lit Club, West Lafayette, In, May 2015.

"Multiple Weather Station Analysis," MISO ILF Stakeholder Workshop #2, Carmel, IN, April 2015.

"State Econometric Models," MISO ILF Stakeholder Workshop #2, Carmel, IN, April 2015.

"2015 Independent Load Forecast – Workshop #1," MISO ILF Stakeholder Workshop #1, Carmel, IN, January 2015.

"Indiana Forecast & Resource Needs," Indiana Electric Cooperatives Annual Meeting, Indianapolis, IN, December 2014.

"Independent Load Forecast Report," MISO Planning Advisory Committee Meeting, Carmel, IN, November 2014.

"Indiana Utility Demand & Rates Forecast," Solar Energy Applications for Agriculture Workshop, Rochester, IN, October 2014.

"Data Mining CO2 Analysis," with S. Hadley and R. Luciani, Eastern Interconnection States' Planning Council Meeting, Washington, DC, October 2014.

"Independent Load Forecast Workshop," MISO ILF Stakeholder Workshop #3, Carmel, IN, September 2014.

"Independent Load Forecast Workshop," MISO ILF Stakeholder Workshop #2, Carmel, IN, July 2014.

"Econometric Forecasting Overview," MISO ILF Stakeholder Workshop #1, Carmel, IN, April 2014.

"State Forecasting Models," MISO ILF Stakeholder Workshop #1, Carmel, IN, April 2014.

"The State Utility Forecasting Group Independent Load Forecasts," MISO Planning Advisory Committee, Carmel, IN, February 2014; and MISO Supply Adequacy Working Group, Carmel, IN, April 2014.

"Eastern Interconnection Transmission Study: Medium-Priority Topics," with S. W. Hadley, to the Eastern Interconnection States' Planning Council Meeting, Naples, FL, March 2014.

"The State Utility Forecasting Group Independent Load Forecasts," MISO Planning Advisory Committee Meeting, Carmel, IN, February 2014.

"Utility Scale Energy Storage Systems," University at Buffalo Department of Electrical Engineering and IEEE Buffalo Section, Buffalo, NY, November 2013.

"Indiana Electricity Price Projections," Indiana Chapter of the International Association of Electrical Inspectors, Lafayette, IN, February 2013.

"Indiana Electricity Projections and Environmental Regulations Study," Hoosier Energy Board of Directors, French Lick, IN, August 2012.

"SUG Forecasting Model," Integrated Modeling Workshop, Indianapolis, IN, November 2011.

"Indiana Electricity Projections: The 2011 Forecast," Indiana Industrial Energy Consumers, Inc., Indianapolis, IN, November 2011; Center for Coal Technology Research Advisory Panel Meeting, South Bend, IN, August 2011.

"Indiana Electricity Industry: Future Needs and Issues," Indiana University Public Policy Institute Energy and Environment Committee, Indianapolis, IN, December 2010.

"Vulnerability of the Electricity Sector to Climate Change in the Midwest," Workshop on: Climate change impacts, vulnerability and adaptation in the Midwest, Bloomington, IN, October 2010.

"The Economic Downturn – Lessons on the Correlation between Economic Growth and Energy Demand," Indiana Bar Association Utility Law Spring Seminar, Indianapolis, IN, April 2010.

"Indiana Electricity Projections: The 2009 Forecast," Center for Coal Technology Research Quarterly Meeting, Indianapolis, IN, March 2010.

"Natural Gas Prices: Past Trends and Future Projections," Vectren Energy Delivery Trade Ally Meeting, Lafayette, IN, September 2009.

"Impacts of CO₂ Restrictions on Indiana Electricity Prices," Richmond Power & Light and the Economic Development Corporation of Wayne County, Richmond, IN, May 2009.

"Economics of Clean Coal," Kazakhstan Visiting Team to Purdue Energy Center, West Lafayette, IN, May 2009.

"Load Forecasting," Midwest Independent Transmission System Operator Advisory Board, Carmel, IN, March 2009.

"The Transmission Grid: Understanding How It Works to Understand Who Should Pay," Organization of MISO States Cost Allocation and Regional Planning Workshop, St. Paul, MN, January 2009.

"Renewable Resources," Purdue Women's Club, West Lafayette, IN, November 2008.

"Indiana Energy Status and SUG Electricity Projections," Indiana Chamber of Commerce Energy Roundtable, Indianapolis, IN, August 2008.

"Impacts of CO₂ Restrictions on Indiana Electricity Prices," Duke Energy/Hoosier Energy/Indiana Municipal Power Agency/Wabash Valley Power Association, Plainfield, IN, April 2008; Indiana Industrial Energy Consumers, Inc., web conference, April 2008.

"Electricity Price Impacts from CO₂ Restrictions," Indiana Center for Coal Technology Research, Indianapolis, IN, March 2008.

"Energy Forecasting Methods," Indiana Utility Regulatory Commission/Indiana Office of the Utility Consumer Counselor, Indianapolis, IN, November 2007.

"Indiana Electricity Projections: The 2007 Forecast," Citizens Action Coalition, Indianapolis, IN, November 2007; Indiana Utility Regulatory Commission staff, Indianapolis, IN, November 2007; Office of the Utility Consumer Counselor, Indianapolis, IN, November 2007; NiSource, Merrillville, IN, November 2007; Indiana Office of Energy and Defense Development, Indianapolis, IN, November 2007; Hoosier Energy, Bloomington, IN, November 2007;

Indianapolis Power & Light, Indianapolis, IN, November 2007; Wabash Valley Power Association, Indianapolis, IN, November 2007; Duke Energy, Plainfield, IN, November 2007.

“Current and Future Status of Indiana's Electricity and Natural Gas Industries,” Indiana Chamber of Commerce Energy Committee, Indianapolis, IN, August 2007.

“Climate Change Legislation in the 110th Congress: April 23 Energy Forum hosted by Congressman Buyer,” Social, Economic, and Political Aspects of Energy group of the Energy Center at Discovery Park, Purdue University, West Lafayette, IN, April 2007.

“Future of Electricity: Regional/National,” Wabash Valley Power Association Annual Meeting, West Lafayette, IN, April 2007.

“History and Functions of the State Utility Forecasting Group,” Albanian regulatory delegation, Carmel, IN, October 2006.

“Overview of Indiana’s Electricity and Natural Gas Industries,” Indiana Chamber of Commerce Energy Committee, Indianapolis, IN, August 2006.

“Indiana Renewable Resources,” Hoosier Energy Board of Directors, Vevay, IN, August 2006.

“Indiana Electricity Projections: The 2005 Forecast,” Wabash Valley Power Association, Indianapolis, IN, December 2005; Indianapolis Power & Light, Indianapolis, IN, November 2005; NiSource, Merrillville, IN, November 2005; Citizens Action Coalition, Indianapolis, IN, November 2005; Office of the Utility Consumer Counselor, Indianapolis, IN, November 2005; American Electric Power, West Lafayette, IN, November 2005; Vectren, Evansville, IN, November 2005; and Cinergy, Plainfield, IN, October 2005.

“Status of Indiana's Electricity and Natural Gas Industries,” Indiana Chamber of Commerce Energy Committee, Indianapolis, IN, October 2005.

“Indiana Electric Utility Infrastructure,” Indiana Society of Professional Engineers, Indianapolis, IN, May 2005.

“Indiana Electricity Needs,” League of Women Voters of Greater Lafayette, Lafayette, IN, January 2004.

“Indiana Electricity Projections: The 2003 Forecast,” Indiana Coal Council, Indianapolis, IN, December 2003; Hoosier Energy, West Lafayette, IN, August 2003; Northern Indiana Public Service Company, Merrillville, IN, July 2003; Citizens Action Coalition, Indianapolis, IN, July 2003; American Electric Power, West Lafayette, IN, July 2003; Wabash Valley Power Association, Indianapolis, IN, July 2003; Cinergy, Plainfield, IN, July 2003; Indiana Department of Commerce Energy & Recycling Division, Indianapolis, IN, July 2003; Indianapolis Power & Light, Indianapolis, IN, July 2003; and Indiana Industrial Energy Consumers, Inc., Indianapolis, IN, July 2003.

“Status of Indiana’s Electricity and Natural Gas Systems,” Indiana Chamber of Commerce Energy Committee, Indianapolis, IN, June 2003.

“The History and Functions of the State Utility Forecasting Group (SUFG),” presented to the Associate Dean for Research, Schools of Engineering, Purdue University, West Lafayette, IN, December 2002.

“State Utility Forecasting Group Modeling and Current Efforts,” presented to delegates of the Economic Community of West African States, West Lafayette, IN, August 2002.

"Research Update: Economic Optimization," Northern Indiana Public Service Company, Merrillville, IN, March 2002.

"Research Update: Control Allocation," Northern Indiana Public Service Company, Merrillville, IN, August 2001.

"Factors Affecting Indiana Electricity Prices in (not so?) Competitive Wholesale Markets," Indiana Industrial Energy Consumers, Inc., Indianapolis, IN, July 2001.

"Can it Happen Here? The California Electricity Crisis and the Situation in the Midwest," Lafayette Lions Club, West Lafayette, IN, May 2001.

"Can it Happen Here? The California Electricity Crisis and the Situation in the Midwest," Tecumseh Kiwanis Club, West Lafayette, IN, April 2001.

"Performing the Independent Market Monitor Function for the Midwest Independent Transmission System Operator, Inc.," Midwest Independent Transmission System Operator, Inc., Indianapolis, IN, February 2001.

"Costs Associated with the Regulation Ancillary Service," Northern Indiana Public Service Company, Merrillville, IN, February 2001.

"Competitive Electricity Market Prices and Imperfections," Indiana Industrial Energy Consumers, Inc. annual planning retreat, Fishers, IN, December 2000.

"Midwest Market Monitoring," Public Utility Commission of Ohio, Columbus, OH, November 2000.

"Policy Implications of Market Power Modeling," SUFG Market Power Workshop, West Lafayette, IN, January 2000.

"Demand-Side Market Power Modeling," SUFG Market Power Workshop, West Lafayette, IN, January 2000.

"Indiana Electricity Projections: The 1999 Forecast," Citizens Action Coalition, Indianapolis, IN, September 1999; Southern Indiana Gas & Electric Company, Evansville, IN, July 1999; American Electric Power Company, Fort Wayne, IN, July 1999; Wabash Valley Power Authority, Indianapolis, IN, July 1999; Indiana Municipal Power Agency, Carmel, IN, July 1999; Northern Indiana Public Service Company, Merrillville, IN, June 1999; Cinergy Corporation, Plainfield, IN, June 1999; Indianapolis Power & Light Company, Indianapolis, IN, June 1999; and Indiana Utility Regulatory Commission, Indianapolis, IN, April 1999.

"The 1999 State Forecast," Indiana AFL-CIO Executive Board Meeting, Indianapolis, IN, March 1999.

"The Projected Impact of Restructuring on Indiana Power Needs and Prices," Commonwealth Edison Company, Lombard, IL, December 1998.

"Update on Decomposing ACE for Apportioning Regulation and Load Following Costs," Center for the Advanced Control of Energy and Power Systems Industry Advisory Board meeting, Phoenix, AZ, November 1998.

"The Projected Impact of Restructuring on Indiana Power Needs and Prices," Citizens Action Coalition, Indianapolis, IN, November 1998.

"Generation Adequacy and Reliability Measures," Southern African Power Pool training workshop, Capetown, South Africa, July 1998.

"Update on Alleviating Transmission Congestion Using FACTS Devices," ACEPS Industry Advisory Board meeting, Golden, CO, May 1998.

"Alleviating Transmission Congestion Using FACTS Devices," Carnegie Mellon University, Pittsburgh, PA, May 1998.

"Alleviating Transmission Congestion Using FACTS Devices," University of Illinois Urbana-Champaign power systems seminar, Urbana, IL, April 1998.

"Electric Utility Restructuring and its Impact on University Research and Teaching," University of Missouri Rolla, Rolla, MO, March 1998.

"Electric Utility Restructuring and its Impact on University Research and Teaching," University of Minnesota, Minneapolis, MN, March 1998.

"The Projected Impact of Electric Utility Restructuring on Indiana Prices," Midwest Builders Convention, Indianapolis, IN, February 1998.

"Alleviating Transmission Congestion Using FACTS Devices," University of Missouri Rolla power systems seminar, Rolla, MO, February 1998.

"The Projected Impact of Restructuring on Indiana Electricity Prices," Kentucky Public Service Commission, Frankfort, KY, January 1998.