

Bruce Edward Biewald, Chief Executive Officer

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SUMMARY

- Expert testimony on energy, economic, and environmental issues in more than 100 utility regulatory proceedings in 26 states and two Canadian provinces, in cases before State and Federal Courts, and in proceedings of the Federal Energy Regulatory Committee and the Nuclear Regulatory Commission's Atomic Safety and Licensing Board.
- Co-author of more than 100 reports, including studies for the Electric Power Research Institute, the US Department of Energy, the US Environmental Protection Agency, the Office of Technology Assessment, the New England Governors' Conference, the National Association of Regulatory Utility Commissioners, and the United Nations Framework Convention on Climate Change.
- Papers published in the Electricity Journal, the Energy Journal, Energy Policy, Public Utilities Fortnightly, Nature Climate Change, and numerous conference proceedings.
- Invited to speak by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers; American Society of Mechanical Engineers; Energy Foundation; International Atomic Energy Agency; the Latin American Energy Association (OLADE); National Association of Regulatory Utility Commissioners; National Association of State Utility Consumer Advocates; National Consumer Law Center; the Swedish Environmental Protection Agency (SNV); the US Environmental Protection Agency; the European Federation of Clean Air and Environmental Protection Associations; and others.

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Founder and Chief Executive Officer*, 1996 – present.

Advise clients on issues of energy economics, environmental impacts, and electric industry regulation. Provide litigation support and expert testimony, author reports, and lead a professional staff of about 30 engineers, scientists, policy experts, and economists, conducting more than 100 consulting assignments each year. Areas of expertise include: electric power system planning, air emissions, climate change policy, social cost of carbon, market power, mergers and acquisitions, generation asset valuation and divestiture, nuclear and fossil power plant costs and performance, renewable resources, power supply contracts and performance standards, green marketing of electricity, nuclear plant decommissioning and radioactive waste issues, environmental externalities valuation, environmental compliance planning, energy conservation and demand-side management, electric power system reliability, avoided costs, dispatch modeling, economic analysis of power plants and resource plans, portfolio management, risk analysis, and risk management.

Tellus Institute, Boston, MA. *Senior Scientist and Manager of the Electricity Program*, 1989 – 1996;
Research Associate and Associate Scientist, 1980 – 1988.

Responsible for research and consulting on all aspects of electric system planning, regulation, and restructuring.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Bachelor of Science in Architecture, Building Technology, and Energy Use in Buildings, 1981

Harvard University Extension School, Cambridge, MA

Graduate courses in micro and macroeconomics, 1989 – 1990

REPORTS

Ackerman, F., B. Biewald. 2019. *The Proposed Plant at Big Bend: A Review of Climate Impacts*. Synapse Energy Economics for Sierra Club.

Knight, P., P. Luckow, B. Biewald, A. Horowitz, A. Allison, F. Ackerman. 2017. *New England's Shrinking Need for Natural Gas: An analysis of policy impacts on natural gas use in New England's electric sector*. Synapse Energy Economics for the Connecticut Fund for the Environment, Consumers for Sensible Energy, Mass Energy Consumers Alliance, Pipe Line Awareness Network for the Northeast, Sierra Club Connecticut, and Sierra Club Massachusetts.

Luckow, P., E.A. Stanton, S. Fields, W. Ong, B. Biewald, S. Jackson, J. Fisher. 2016. *Spring 2016 National Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Jackson, S., N. R. Santen, P. Knight, S. Fields, B. Biewald, E. A. Stanton. 2015. *Clean Power Plan Handbook: A Guide to the Final Rule for Consumer Advocates*. Synapse Energy Economics for National Association of State Utility Consumer Advocates.

Knight, P., S. Fields, S. Jackson, W. Ong, N. R. Santen, B. Biewald, E. A. Stanton. 2015. *Multi-State Compliance with the Clean Power Plan in CP3T*. Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Vitolo, T., P. Luckow, S. Fields, P. Knight, B. Biewald, E. A. Stanton. 2015. *Lower Electric Costs in a Low-Emission Future*. Synapse Energy Economics.

Biewald, B., J. Daniel, J. Fisher, P. Luckow, A. Napoleon, N. R. Santen, K. Takahashi. 2015. *Air Emissions Displacement by Energy Efficiency and Renewable Energy*. Synapse Energy Economics.

Jackson, S., N. R. Santen, P. Knight, S. Fields, B. Biewald, E. A. Stanton. 2015. *Clean Power Plan Handbook: A Guide to the Final Rule for Consumer Advocates*. Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Knight, P., S. Fields, S. Jackson, W. Ong, N. R. Santen, B. Biewald, E. A. Stanton. 2015. *Multi-State Compliance with the Clean Power Plan in CP3T*. Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Wilson, R., M. Whited, S. Jackson, B. Biewald, E. A. Stanton. 2015. *Best Practices in Planning for Clean Power Plan Compliance*. Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Luckow, P., E. A. Stanton, S. Fields, B. Biewald, S. Jackson, J. Fisher, R. Wilson. 2015. *2015 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Fields, S., E. A. Stanton, P. Knight, B. Biewald, J. Daniel, S. Jackson, E. Karaca, J. Rosenkranz, K. Takahashi. 2014. *Calculating Alabama's 111(d) Target*. Synapse Energy Economics for the Southern Environmental Law Center.

Fields, S., E. A. Stanton, P. Knight, B. Biewald, J. Daniel, S. Jackson, E. Karaca, J. Rosenkranz, K. Takahashi. 2014. *Calculating Georgia's 111(d) Target*. Synapse Energy Economics for the Southern Environmental Law Center.

Fields, S., E. A. Stanton, P. Knight, B. Biewald, J. Daniel, S. Jackson, E. Karaca, J. Rosenkranz, K. Takahashi. 2014. *Alternate Scenarios for 111(d) Implementation in North Carolina*. Synapse Energy Economics for the Southern Environmental Law Center.

Wilson, R., B. Biewald, D. White. 2014. *Review of BC Hydro's Alternatives Assessment Methodology*. Synapse Energy Economics for BC Hydro.

Stanton, E. A., S. Jackson, B. Biewald, M. Whited. 2014. *Final Report: Implications of EPA's Proposed "Clean Power Plan."* Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

White, D., B. Biewald. 2014. *Findings Regarding the NSPI 2014 Load Forecast*. Synapse Energy Economics for the Nova Scotia Utility and Review Board.

Luckow, P., E. A. Stanton, B. Biewald, S. Fields, S. Jackson, J. Fisher, F. Ackerman. 2014. *CO₂ Price Report, Spring 2014: Includes 2013 CO₂ Price Forecast*. Synapse Energy Economics.

Fisher, J., P. Knight, E. A. Stanton, and B. Biewald. 2014. *Avoided Emissions and Generation Tool (AVERT): User Manual*. Version 1.0. Synapse Energy Economics for the U.S. Environmental Protection Agency.

White, D. E., M. Chang, B. Biewald. 2013. *State Energy Efficiency Embedded in Annual Energy Outlook Forecasts: 2013 Update*. Synapse Energy Economics for the US Environmental Protection Agency.

Luckow, P., E. A. Stanton, B. Biewald, J. Fisher, F. Ackerman, E. Hausman. 2013. *2013 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Knight, P., E. A. Stanton, J. Fisher, B. Biewald. 2013. *Forecasting Coal Unit Competitiveness: Coal Retirement Assessment Using Synapse's Coal Asset Valuation Tool (CAVT)*. Synapse Energy Economics for Energy Foundation.

Knight, P., B. Biewald, J. Daniel. 2013. *Displacing Coal: An Analysis of Natural Gas Potential in the 2012 Electric System Dispatch*. Synapse Energy Economics for Energy Foundation.

Fagan R., J. Fisher, B. Biewald. 2013. *An Expanded Analysis of the Costs and Benefits of Base Case and Carbon Reduction Scenarios in the EIPC Process*. Synapse Energy Economics for The Sustainable FERC Project.

Hornby R., P. Chernick, D. White, J. Rosenkranz, R. Denhardt, E. Stanton, J. Glifford, B. Grace, M. Chang, P. Luckow, T. Vitolo, P. Knight, B. Griffiths, B. Biewald. 2013. *Avoided Energy Supply Costs in New England: 2013 Report*. Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Wilson R., B. Biewald. 2013. *Best Practices in Electric Utility Integrated Resource Planning: Examples of State Regulations and Recent Utility Plans*. Synapse Energy Economics for Regulatory Assistance Project.

Wilson R., P. Luckow, B. Biewald, F. Ackerman, E. Hausman. 2012. *2012 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Biewald B., T. Vitolo, P. Luckow. 2012. *Comments Regarding KCP&L's 2012 IRP Filing*. Sierra Club, Synapse Energy Economics.

Fisher J., S. Jackson, B. Biewald. 2012. *The Carbon Footprint of Electricity from Biomass: A Review of the Current State of Science and Policy*. Synapse Energy Economics.

Chang M., D. White, P. Knight, B. Biewald. 2012. *Energy Benefits Resulting from the Investment of 2010 RGGI Auction Revenues in Energy Efficiency*. Synapse Energy Economics for Regulatory Assistance Project.

Fisher, J., C. James, N. Hughes, D. White, R. Wilson, B. Biewald. 2011. *Emissions Reductions from Renewable Energy and Energy Efficiency in California Air Quality Management Districts*. Synapse Energy Economics for California Energy Commission.

Keith G., B. Biewald, E. Hausman, K. Takahashi, T. Vitolo, T. Comings, P. Knight. 2011. *Toward a Sustainable Future for the US Power Sector: Beyond Business as Usual 2011*. Synapse Energy Economics for Civil Society Institute.

Chang M., D. White, E. Hausman, N. Hughes, B. Biewald. 2011. *Big Risks, Better Alternatives: An Examination of Two Nuclear Energy Projects in the US*. Synapse Energy Economics for Union of Concerned Scientists.

Hornby R., P. Chernick, C. Swanson, D. White, J. Gifford, M. Chang, N. Hughes, M. Wittenstein, R. Wilson, B. Biewald. 2011. *Avoided Energy Supply Costs in New England: 2011 Report*. Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Woolf T., V. Sabodash, B. Biewald. 2011. *Equipment Price Forecasting in Energy Conservation Standards Analysis Comments*. Synapse Energy Economics for the US Department of Energy on behalf of the Natural Resources Defense Council and the Appliance Standards Awareness Project.

Johnston L., E. Hausman., B. Biewald, R. Wilson, D. White. 2011. *2011 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Fisher J., R. Wilson, N. Hughes, M. Wittenstein, B. Biewald. 2011. *Benefits of Beyond BAU: Human, Social, and Environmental Damages Avoided Through the Retirement of the US Coal Fleet*. Synapse Energy Economics for Civil Society Institute.

Chang M., D. White, L. Johnston, B. Biewald. 2010. *Electricity Energy Efficiency Benefits of RGGI Proceeds: An Initial Analysis*. Synapse Energy Economics for Regulatory Assistance Project.

Keith, G., B. Biewald, K. Takahashi, A. Napoleon, N. Hughes, L. Mancinelli, E. Brandt. 2010. *Beyond Business as Usual: Investigating a Future without Coal and Nuclear Power in the US*. Synapse Energy Economics for Regulatory Assistance Project.

Hornby R., P. Chernick, C. Swanson, D. White, I. Goodman, B. Grace, B. Biewald, C. James, B. Warfield, J. Gifford, M. Chang. 2009. *Avoided Energy Supply Costs in New England: 2009 Report*. Synapse Energy Economics for Avoided-Energy-Supply-Component (AESC) Study Group.

Hausman, E., J. Fisher, L.A. Mancinelli, B. Biewald. 2009. *Productive and Unproductive Costs of CO₂ Cap-and-Trade: Impacts on Electricity Consumers and Producers*. Synapse Energy Economics for the National Association of Regulatory Utility Commissioners, The National Association of State Utility Consumer Advocates (NASUCA), The National Rural Electric Cooperative Association (NRECA), The American Public Power Association (APPA).

Biewald B, D. White, J. Fisher, M. Chang, and L. Johnston. 2009. *Incorporating Carbon Dioxide Emissions Reductions in Benefit Calculations for Energy Efficiency: Comments on the Department of Energy's Methodology for Analysis of the Proposed Lighting Standard*. Synapse Energy Economics for New York State Attorney General.

Hurley D., K. Takahashi, B. Biewald, J. Kallay, and R. Maslowski. 2008. *Cost and Benefits of Electric Utility Energy Efficiency in Massachusetts*. Synapse Energy Economics for Northeast Energy Efficiency Council.

Hausman, E., J. Fisher, and B. Biewald. 2008 *Analysis of Indirect Emissions Benefits of Wind, Landfill Gas, and Municipal Solid Waste Generation*. Synapse Energy Economics for US Environmental Protection Agency.

Schlissel, D., L. Johnston, B. Biewald, D. White, E. Hausman, C. James, and J. Fisher 2008. *Synapse 2008 CO₂ Price Forecasts*. Synapse Energy Economics.

Schlissel D., L. Johnston, J. Kallay, C. James, A. Sommer, B. Biewald, E. Hausman, A. Smith. 2008. *Don't Get Burned: The Risks of Investing in New Coal-Fired Generating Facilities*. Synapse Energy Economics for Interfaith Center on Corporate Responsibility.

Biewald, B., B. Powers, and B. Warfield. 2007. *Tufts Cove Waste Heat Recovery Project*. Synapse Energy Economics for the Nova Scotia Utility and Review Board. Revised August 4, 2008.

Hornby, R., C. Swanson, D. White, P. Chernick, B. Biewald, J. Kallay. 2007. *Avoided Energy Supply Costs: 2007 Final Report*. Prepared for AESC / Massachusetts Avoided Energy Supply Components Study Group.

Hausman, E., B. Biewald, K. Takahashi. 2006. *The Deerfield Wind Project – Assessment of the Need for Power and the Economic and Environmental Attributes of the Project*. Synapse Energy Economics for PPM Energy.

Steinhurst, W., D. White, R. Hornby, A. Napoleon, A. Roschelle, B. Biewald. 2006. *Portfolio Management: Tools and Practices for Regulators*. Synapse Energy Economics for the National Association of Regulatory Utility Commissioners by.

Peterson P., D. Hurley, T. Woolf, B. Biewald. 2006. *Incorporating Energy Efficiency into the ISO New England Forward Capacity Market: Ensuring the Capacity Market Properly Values Energy Efficiency Resources*. Synapse Energy Economics for Conservation Services Group.

The Delaware Cabinet Committee on Energy with technical assistance from Synapse Energy Economics. 2006. *Ensuring Delaware's Energy Future: A Response to Executive Order Number 82*. Prepared for the Delaware Public Service Commission Staff.

E. Hausman, Bruce Biewald, K. Takahashi, D. Schlissel. 2007. *The Proposed Broadwater LNG Import Terminal Response to Draft Environmental Impact Statement and Update of Synapse Analysis*. Synapse Energy Economics for the Connecticut Fund for the Environment and Save The Sound by.

Biewald, B., E. Hausman, P. Peterson, D. White. 2006. *RPM 2006: Windfall Profits for Existing Base Load Units in PJM*. Synapse Energy Economics for the Pennsylvania Office of Consumer Advocate.

E. Hausman, P. Peterson, D. White, B. Biewald. 2005. *A RPM Case Study: Higher Costs for Consumers, Windfall Profits for Exelon*. Synapse Energy Economics for Illinois Citizens Utility Board.

Johnston, L., A. Roschelle, E. Hausman, A. Sommer, B. Biewald. 2005. *Considering Climate Change in Electric Resource Planning: Zero is the Wrong Value*. Synapse Energy Economics for Citizens Action Coalition of Indiana and Hoosier Environmental Council.

Synapse Energy Economics. 2005. *Using Electric System Operating Margins and Build Margins in Quantification of Carbon Emission Reductions Attributable to Grid Connected CDM Projects*. Prepared for the United Nations Framework Convention on Climate Change.

Biewald, B., G. Keith. 2005. *Methods for Estimating Emissions Avoided by Renewable Energy and Energy Efficiency*. Synapse Energy Economics for the US Environmental Protection Agency.

Steinhurst, W., R. McIntyre, B. Biewald, C. Chen, K. Takahashi. 2005. *Economic Impacts and Avoided Air Emissions from Renewable Generation and Efficiency Programs in New England*. Synapse Energy Economics for Regulatory Assistance Project.

White, D., B. Biewald. 2005. *Electric Price Forecasts for St. Lawrence Hydroelectric Generation*. Synapse Energy Economics for the International Joint Commission (IJC).

Biewald, B., D. White, G. Keith, T. Woolf. 2004. *A Responsible Electricity Future: An Efficient, Cleaner and Balanced Scenario for the US Electricity System*. Synapse Energy Economics for the National Association of State PIRGs.

Biewald B., W. Steinhurst, D. White, A. Roschelle. 2004. *Electricity Prices in PJM: Comparison of Wholesale Power Costs in the PJM Market to Indexed Generation Service Costs*. Synapse Energy Economics for PJM Interconnection, L.L.C.

Biewald, B., T. Woolf, A. Roschelle, W. Steinhurst. 2003. *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*. Synapse Energy Economics for Regulatory Assistance Project and Energy Foundation.

Keith, G., B. Biewald, D. White, F. Zalcman. 2003. *A Clean Electricity Strategy for the Hudson River Valley*. Synapse Energy Economics and Pace Law School Energy Project for the Hudson River Foundation.

Keith, G., B. Biewald, A. Sommer, P. Henn, and M. Breceda. 2003. *Estimating the Environmental Benefits of Renewable Energy and Energy Efficiency in North America: Experience and Methods*. Synapse Energy Economics and Energy Matters for the Commission for Environmental Cooperation.

Biewald, B., C. Chen, A. Sommer, W. Steinhurst, and D. E. White. 2003. *Comments on the RPS Cost Analyses of the Joint Utilities and the DPS Staff*. Synapse Energy Economics for the Renewable Energy Technology and Environment Coalition.

Keith, G., B. Biewald, D. White, and M. Drusic. 2003. *Modeling Demand Response and Air Emissions in New England*. Synapse Energy Economics for the US Environmental Protection Agency.

Keith, G., B. Biewald, D. White, A. Sommer and C. Chen. 2003. *Cleaner Air, Fuel Diversity and High-Quality Jobs: Reviewing Selected Potential Benefits of an RPS in New York State*. Synapse Energy Economics for the Renewable Energy Technology and Environment Coalition.

Peterson, P., D. White, B. Biewald, and C. Chen. 2003. *The New England Experiment: An Evaluation of the Wholesale Electricity Markets*. Synapse Energy Economics for the Connecticut Office of Consumer Counsel, Maine Office of the Public Advocate, and New Hampshire Office of Consumer Advocate.

Schlissel, D., P. Peterson, and B. Biewald. 2002. *Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-Tiered Holding Companies to Own Nuclear Power Plants*. Synapse Energy Economics for the STAR Foundation and Riverkeeper, Inc.

Keith, G., and B. Biewald. 2002. *Predicting Avoided Emissions from Policies that Encourage Energy Efficiency and Clean Power*. Synapse Energy Economics for the Ozone Transport Commission.

Johnston, L., G. Keith, T. Woolf, B. Biewald, and E. Gonin. 2002. *Survey of Clean Power and Energy Efficiency Programs*. Synapse Energy Economics for the Ozone Transport Commission.

Chernick, P., S. Geller, B. Biewald, and D. White. 2001. *Updated Avoided Energy-Supply Costs for Demand-Side Management Screening in Massachusetts*. Resource Insight and Synapse Energy Economics for the AESC Study Group.

Peterson, P., B. Biewald, L. Johnston, E. Gonin, and J. Wallach. 2001. *Best Practices in Market Monitoring: A Survey of Current ISO Activities and Recommendations for Effective Market Monitoring and Mitigation in Wholesale Electricity Markets*. Synapse Energy Economics for the Maryland Office of People's Counsel, the Pennsylvania Office of Consumer Advocate, the Delaware Division of the Public Advocate, the New Jersey Division of the Ratepayer Advocate, and the Office of the People's Counsel of the District of Columbia.

Biewald, B., D. White, and M. Ramiro. 2001. *Electricity Market Analysis of Coal Waste Regulations: An Illustrative Midwest Case Study*. Synapse Energy Economics for US Environmental Protection Agency.

Biewald, B., L. Johnston, J. A. Ramey, P. Peterson, D. White. 2001. *The Other Side of Competitive Markets: Developing Effective Load Response in New England's Electricity Market*. Synapse Energy Economics for the Maine Department of Attorney General and the Maine Office of the Public Advocate.

Biewald, B., D. Allen, D. White, N. Talbot, P. Kirshen, L. K. Martin, P. Chernick, R. Brailove. 2001. *Valuation of the Bellows Falls Hydroelectric Generating Station as of April 2001*. Synapse Energy Economics, Martin Appraisal Service, and Resource Insight for the Vermont Department of Taxes.

Biewald, B., L. Johnston, and D. Schlissel. 2001. *Room to Breathe: Why the Massachusetts Department of Environmental Protection's Proposed Air Regulations Are Compatible With Electric System Reliability*. Synapse Energy Economics for MASSPIRG and Clean Water Fund.

Synapse Energy Economics. 2001. *Repowering the Midwest: A Plan for Cleaning Up the Electricity Industry in America's Heartland*. Prepared for the Environmental Law and Policy Center and a coalition of Midwest environmental organizations.

Allen, D., B. Biewald, and D. Schlissel. 2001. *Generator Outage Increases: A Preliminary Analysis of Outage Trends in the New England Electricity Market*. Synapse Energy Economics for the Union of Concerned Scientists.

Woolf, T., B. Biewald, and D. Allen. 2000. *Marginal Price Assumptions for Estimating Customer Benefits of Air Conditioner Efficiency Standards: Comments on the Department of Energy's Proposed Rules for Central Air Conditioners and Heat Pump Energy Conservation Standards*. Synapse Energy Economics for the Appliance Standards Awareness Project.

Gibbs, B., and B. Biewald. 2000. *Transmitting Windpower from the Dakotas to Chicago: A Preliminary Analysis of a Hydrogen Transmission Scenario*. Synapse Energy Economics for the Environmental Law and Policy Center, with funding from the Leighty Foundation.

Biewald, B., D. Allen, D. White, N. Talbot, P. Kirshen, L. K. Martin, P. Chernick, R. Brailove. 2000. *Valuation of Hydroelectric Generating Facilities on the Connecticut and Deerfield Rivers in Vermont*.

Synapse Energy Economics, Martin Appraisal Service, and Resource Insight for the Vermont Department of Taxes.

Biewald, B., J. Cavicchi, T. Woolf, D. Allen. 2000. *Use of Selective Catalytic Reduction For Control of NOx Emissions From Power Plants in the US*. Synapse Energy Economics for the OntAIRio Campaign.

Woolf, T., B. Biewald, and D. White. 1999. *Electricity Market Distortions Associated With Inconsistent Air Quality Regulations*. Synapse Energy Economics for the Project for Sustainable FERC Energy Policy.

Brailove, R., P. Chernick, S. Geller, B. Biewald, and D. White. 1999. *Avoided Energy-Supply Costs for Demand-Side Management Screening in Massachusetts*. Resource Insight and Synapse Energy Economics for the AESC Study Group.

Comments on the Scope of Issues for FERC Staff's Environmental Assessment of the Proposed Rule on RTOs by the Project for Sustainable FERC Energy Policy on behalf of Multiple Parties, prepared by Terry Black and Bruce Biewald, June 14, 1999.

Biewald B., and D. White. 1999. *Stranded Nuclear Waste: Implications of Electric Industry Deregulation for Nuclear Plant Retirements and Funding for Decommissioning and Spent Fuel*. Synapse Energy Economics for Citizens Action Coalition of Indiana.

Synapse Energy Economics, Environmental Futures, Inc., and Tellus Institute. 1998. *New England Tracking System*. Prepared for the New England Governors' Conference, Inc., funded by a grant from the US Environmental Protection Agency.

Woolf, T., D. White, B. Biewald, and W. Moomaw. 1998. *The Role of Ozone Transport In Reaching Attainment in the Northeast: Opportunities, Equity and Economics*. Synapse Energy Economics for the Northeast States for Coordinated Air Use Management.

Woolf, T., B. Biewald, and D. Glover. 1998. *Competition and Market Power in Northern Maine Electricity Market*. Synapse Energy Economics for the Maine Public Utilities Commission.

Biewald, B., D. White, T. Woolf, F. Ackerman, and W. Moomaw. 1998. *Grandfathering and Environmental Comparability: An Economic Analysis of Air Emission Regulations and Electricity Market Distortions*. Synapse Energy Economics for the National Association of Regulatory Utility Commissioners.

Biewald, B., and D. White. 1998. *Analysis of Market Power in the APS and Duquesne Service Territories*. Synapse Energy Economics for the Maryland Office of People's Counsel.

Biewald, B., T. Woolf, P. Bradford, P. Chernick, S. Geller, and J. Oppenheim. 1997. *Performance-Based Regulation in a Restructured Electric Industry*. Synapse Energy Economics for the National Association of Regulatory Utility Commissioners.

Biewald, B., T. Woolf, and M. Breslow. 1997. *Massachusetts Electric Utility Stranded Costs*. Synapse Energy Economics for MASSPIRG, Union of Concerned Scientists, Clean Water Action, Massachusetts Citizens for Safe Energy, and Public Citizen.

Biewald, B., D. E. White, and W. Steinhurst. 1997. *Horizontal Market Power in New England Electricity Markets: Simulation Results and a Review of NEPOOL's Analysis*. Synapse Energy Economics for the New England Conference of Public Utility Commissioners. Draft published as Vermont DPS Technical Report No. 39.

Biewald, B., T. Woolf, B. Dougherty, and D. Singh. 1997. *Zero Carbon Electricity: The Essential Role of Efficiency and Renewables in New England's Electricity Mix*. Tellus Institute for the Boston Edison Company Settlement Board.

Moskovitz, D., T. Austin, C. Harrington, B. Biewald, D. E. White, and R. Bigelow. 1997. *Full Environmental Disclosure for Electricity: Tracking and Reporting Key Information*. Regulatory Assistance Project report funded by the Pew Charitable Trusts, the Joyce-Mertz Gilmore Foundation, the US Environmental Protection Agency, and the US Department of Energy.

Chernick, P., J. Wallach, S. Geller, J. Plunkett, R. Colton, P. Bradford, B. Biewald, and D. Wise. 1997. *Restructuring the Electric Utilities of Maryland: Protecting and Advancing Consumer Interests*. Prepared for the Maryland People's Counsel.

Biewald, B., M. Duckworth, G. McClain, D. Nichols, R. Rosen, and S. Ferrey. 1997. *Sustainable Electricity for New England: Developing Regulatory and Other Governmental Tools to Promote and Support Environmentally-Sustainable Technologies in the Context of Electric Industry Restructuring*. Tellus Institute for the New England Governors' Conference. Tellus No. 95-310.

Biewald, B., P. Chernick, J. Wallach, and P. Bradford. 1996. *Restructuring New Hampshire's Electric Power Industry: Stranded Costs and Market Power*. Synapse Energy Economics for the New Hampshire Office of Consumer Advocate. Synapse Report No. 96-05.

Biewald, B., P. Chernick, J. Wallach, and P. Bradford. 1996. *Comments of the New Hampshire Office of Consumer Advocate on Restructuring New Hampshire's Electric Utility Industry*. Synapse Report No. 96-04.

Stutz, J., B. Biewald, D. Singh, T. Woolf, G. Edgar, and W. DeForrest. 1996. *Can We Get There From Here?: The Challenge of Restructuring the Electricity Industry so that We Can All Benefit*. Prepared for CalNeva, Consumer Action, Consumer Federation of California, Consumers First, Greenlining Coalition, Latino Issues Forum, Towards Utility Rate Normalization, and Utility Consumers' Action Network.

Bernow, S., B. Biewald, W. Dougherty, M. Duckworth, and D. Singh. 1996. *A Study of the Impacts of EPA Phase II SO₂ and NO_x Emissions Standards on Electrical Facilities in the ECAR Region*. Tellus Institute for the Advisory Committee on Competition in Ontario's Electricity System, Ministry of Environment and Energy. Tellus No. 96-069.

Duckworth, M., and B. Biewald. 1996. *A Projection of Future Market-Based Prices for Air Emissions: Consequences for Renewable and Demand-Side Management Resources*. Tellus Institute for the Massachusetts Division of Energy Resources.

Tellus Institute. 1995. *Promoting Environmental Quality in a Restructured Electric Industry*. Prepared for the National Association of Regulatory Utility Commissioners. Tellus No. 95-056.

Tellus Institute. 1995. *Systems Benefits Funding Options*. Prepared for Wisconsin Environmental Decade. Tellus No. 95-248.

Tellus Institute. 1995. *Costing Energy Resource Options: An Avoided Cost Handbook for Electric Utilities*. Prepared for the US Environmental Protection Agency. Tellus No. 93-251.

Tellus Institute. 1995. *Electric Resource Planning for Sustainability*. Prepared for the Texas Sustainable Energy Development Council. Tellus No. 94-114.

Tellus Institute. 1994. *New York State Environmental Externalities Cost Study Report; Report 3a: EXMOD User manual; Report 3b: EXMOD Reference manual; Report 4: Case Studies*. Prepared for the Empire State Electric Energy Research Corporation and New York State Energy Research and Development Authority. ESEERCO Project EP91-50.

Tellus Institute. 1994. *Comments on the DOE's Proposed Rulemaking Regarding Energy Conservation Standards for Three types of Consumer Products: Including Fuel Cycle Environmental Impacts and Resource Depletion in a Societal Cost-Benefit Framework*.

Tellus Institute. 1994. *Comments on the Northwest Power Planning Council's Issue Paper #94-50: "Accounting for Environmental Externalities in the Power Plan"*. Tellus No. 94-284.

Tellus Institute. 1994. *Comments on Incentive Regulation in Massachusetts, DPU 94-158*.

Tellus Institute. 1994. *Valuation of Environmental and Human Health Risks Associated with Electric Power Generation: A Discussion of Methods and a Review of Greenhouse Gas Studies*. Prepared for the Izaak Walton League of America, Minnesotans for an Energy Efficient Economy, American Wind Energy Association, Clean Water Action, American Lung Association, Minnesota Center for Environmental Advocacy, and Institute for Local Self Reliance. Tellus No. 94-202.

Tellus Institute. 1994. *Resource and Compliance Planning: A Utility Case Study of Combined SO₂/CO₂ Reduction*. Prepared for the US Environmental Protection Agency Acid Rain Division. Tellus No. 92-185.

Tellus Institute. 1994. *Modeling Renewable Electric Resources: A Case Study of Wind*. Prepared for the US Department of Energy. Tellus No. 91-187.

Tellus Institute. 1994. *A Review of Methods and Models for Estimating the System Risk Reduction Value of DSM*. Prepared for the Boston Edison Settlement Board. Tellus No. 93-174B.

Tellus Institute. 1994. *Life Extension and Repowering for Fossil Plants: Guidelines for Evaluating Projects*. Prepared for Energy Foundation. Tellus No. 92-147A.

Tellus Institute. 1994. *License Renewal for Nuclear Power Plants: Guidelines for Evaluating Continued Operation*. Prepared for Energy Foundation. Tellus No. 92-147B.

Tellus Institute. 1994. *Greenhouse Gas Emissions: Targets and Control Costs*. Prepared for the British Columbia Energy Coalition. Tellus No. 94-195.

Tellus Institute. 1994. *Non-Price Benefits of BECo Demand-Side Management Programs*. Prepared for the Boston Edison Settlement Board. Tellus No. 93-174A.

Tellus Institute. 1994. *Development of Externality Values for Energy Resource Planning in Ontario: Air Pollutants*. Prepared for the Ontario Externalities Collaborative. Tellus No. 94-016/2.

Tellus Institute. 1994. *Development of Externality Values for Energy Resource Planning in Ontario: Air Toxics - Heavy Metals*. Prepared for the Ontario Externalities Collaborative. Tellus No. 94-016/3.

Tellus Institute. 1994. *Development of Externality Values for Energy Resource Planning in Ontario: Greenhouse Gases*. Prepared for the Ontario Externalities Collaborative. Tellus No. 94-016/4.

Tellus Institute. 1994. *Development of Externality Values for Energy Resource Planning in Ontario: Land and Water Impacts*. Prepared for the Ontario Externalities Collaborative. Tellus No. 94-016/5.

Tellus Institute. 1994. *Development of Externality Values for Energy Resource Planning in Ontario: Nuclear Fuel Cycle Externalities: Uranium Mining, Reactor Operations, Accidents, and Waste Disposal*. Prepared for the Ontario Externalities Collaborative. Tellus No. 94-016/6.

Tellus Institute. 1994. *Comments on the State of Wisconsin Draft Environmental Impact Statement - Point Beach Nuclear Power Plant Projects Proposed by Wisconsin Electric Power Company*. Prepared for the Wisconsin Citizens' Utility Board. Tellus No. 92-058.

Tellus Institute. 1994. *Incorporating Environmental Externalities in Energy Decisions: A Guide for Energy Planners*. Prepared for the Swedish International Development Agency. Tellus No. 91-157.

Tellus Institute. 1994. *Development of Externality Values for Energy Resource Planning in Ontario: Introductory Report*. Prepared for the Ontario Externalities Collaborative. Tellus No. 94-016/1.

Tellus Institute. 1993. *Cooling Towers for Hudson River Power Plants, Economic and Environmental Considerations*. Prepared for Scenic Hudson, Inc. Tellus No. 92-022.

Tellus Institute. 1993. *Energy Efficiency for Massachusetts: A Strategy for Energy, Environment and the Economy*. Prepared for the Massachusetts Division of Energy Resources. Tellus No. 92-236D.

Tellus Institute. 1993. *Renewable Energy for Massachusetts: A Strategy for Energy, Environment and the Economy*. Prepared for the Massachusetts Division of Energy Resources. Tellus No. 92-236H.

Tellus Institute. 1992. *The Environmental Impacts of Demand-Side Management Measures*. Prepared for the Electric Power Research Institute. EPRI No. TR-101573, Research Project 3121-05. Tellus No. 92-089.

Tellus Institute. 1992. *Incorporating Environmental Externalities in Electric System Planning*. Prepared for the Colorado Office of Energy Conservation. Tellus No. 91-203/SB.

Tellus Institute. 1992. *Evaluation of the Application of Aquidneck Power Limited Partnership to Construct an Energy Facility in Portsmouth, Rhode Island*. Prepared for the Rhode Island Division of Public Utilities

and Carriers, The Governor's Office of Housing, Energy and Intergovernmental Relations, and The Department of Administration/Division of Planning. Tellus No. 91-255.

Tellus Institute. 1992. *Need for and Alternatives to Nuclear Plant License Renewal*. Sponsored by the Vermont Department of Public Service. Tellus No. 91-248.

Tellus Institute. 1992. *Preliminary Study on Integrated Resource Planning for the Consumers' Gas Company, Ltd.* Prepared for Consumers Gas Company, Ltd. Tellus No. 91-001.

Tellus Institute. 1991. *America's Energy Choices: Investing in a Strong Economy and a Clean Environment*. In collaboration with the Union of Concerned Scientists, the American Council for an Energy Efficient Economy, the Natural Resources Defense Council, and the Alliance to Save Energy. Tellus No. 90-067.

Tellus Institute. 1991. *Valuation of Environmental Externalities: Sulfur Dioxide and Greenhouse Gases*. Prepared for the Massachusetts Division of Energy Resources. Tellus No. 91-085.

Tellus Institute. 1991. *CASM: Coordinated Abatement Strategy Model*, Stockholm Environment Institute, Stockholm, Sweden. November 1991.

Tellus Institute. 1991. *Valuation of Environmental Externalities for Electric Utility Resource Planning in Wisconsin*. Prepared for Citizens for a Better Environment, Milwaukee, WI. Tellus No. 91-104.

Tellus Institute. 1991. *The Environmental Costs and Benefits of DSM: A Framework for Analysis*. Prepared for the Electric Power Research Institute. Tellus No. 90-177.

Tellus Institute. 1991. *The Potential Impact of Environmental Externalities on New Resource Selection and Electric Rates*. Prepared for and with the Massachusetts Division of Energy Resources. Tellus No. 90-165.

Tellus Institute. 1990. *Environmental Impacts of Long Island's Energy Choices: The Environmental Benefits of Demand-Side Management*. Prepared for Long Island Power Authority. Tellus No. 90-028A.

Tellus Institute. 1990. *Review of Southern Connecticut Gas Company's Conservation Impact Model*. Prepared for the Conservation Collaborative Group (Southern Connecticut Gas Company, Connecticut Department of Public Utility Control (DPUC), Prosecutorial Division, DPUC, Office of Policy and Management/Energy Division, and Office of Consumer Counsel). Tellus No. 90-084.

Tellus Institute. 1990. *Disposal Costs at Existing and Proposed Low-Level Radioactive Waste Disposal Facilities and the Implications for Vermont*. Prepared for the Vermont Department of Public Service. Tellus No. 89-168.

Energy Systems Research Group. 1990. *Affidavit on Seabrook Decommissioning*. Prepared for the Massachusetts Attorney General. ESRG No. 89-246.

Energy Systems Research Group. 1989. *The Economics of the Palisades Nuclear Plant: An Analysis of the Proposed Sale and Power Purchase Agreement*. Prepared for the Michigan Attorney General. ESRG No. 88-100C.

Energy Systems Research Group. 1988. *An Analysis of Physical Excess and Uneconomic Capacity Resulting from the Addition of Beaver Valley 2 and Perry 1 to the Centerior Generating System*. Prepared for the Ohio Office of Consumers' Counsel. ESRG No. 88-38B.

Energy Systems Research Group. 1988. *The Economics of Diablo Canyon: Analyses of the Proposed Settlement Agreement and the Continued Operation of the Plant*. Prepared for the Redwood Alliance. ESRG No. 88-050R.

Energy Systems Research Group. 1987. *The Fort St. Vrain Nuclear Plant: Economics and Related Issues*. Prepared for the Colorado Office of Consumer Council. ESRG No. 86-004.

Energy Systems Research Group. 1987. *Towards an Energy Transition on Long Island: Issues and Directions for Planning*. Prepared for Nassau and Suffolk Counties, New York. ESRG No. 87-05.

Energy Systems Research Group. 1986. *The Economics of Completing and Operating the Vogtle Nuclear Generating Facility*. Prepared for the Georgia Office of Consumers' Utility Counsel. ESRG No. 85-098.

Energy Systems Research Group. 1986. *Audit-Related Issues in the WHIP Program*. Prepared Technical Development Corporation. ESRG No. 85-41.

Energy Systems Research Group. 1985. *Two Issues in Georgia Power Company's Planning: The Economics of the Vogtle Plant - The Company's Load Forecasting*. ESRG No. 85-51A.

Energy Systems Research Group. 1984. *Cost-Benefit Analysis of the Cancellation of Commonwealth Edison's Braidwood Nuclear Generating Station*. ESRG No. 83-87.

Energy Systems Research Group. 1984. *The Economics of Seabrook 1 from the Perspective of the Three Maine Co-owners*. Prepared for the Maine Public Utilities Commission. ESRG No. 84-38.

Energy Systems Research Group. 1984. *Evaluation of the Massachusetts Energy Conservation Service*. ESRG No. 84-07.

Energy Systems Research Group. 1984. *Electric Rate Consequences of Cancellation of the Midland Nuclear Power Plant*. ESRG No. 83-81/1.

Energy Systems Research Group. 1984. *Power Planning in Kentucky: Assessing Issues and Choices, Technical Report III: Conservation as a Planning Option*. ESRG No. 83-51/TRIII.

Energy Systems Research Group. 1984. *Electric Rate Consequences of Retiring the Robinson 2 Nuclear Power Plant*. ESRG No. 83-10.

Energy Systems Research Group. 1983. *Power Planning in Kentucky: Assessing Issues and Choices, Technical Report I: Long Range Forecasts of Electricity Requirements for Kentucky and its Six Major Utilities*. ESRG No. 83-51/TRI.

Energy Systems Research Group. 1983. *Power Planning in Kentucky: Assessing Issues and Choices*. Prepared the project summary for the Public Service Commission. ESRG No. 83-51.

Energy Systems Research Group. 1983. *Electricity and Gas Savings from Expanded Public Service Electric and Gas Company Conservation Programs*. Prepared the New Jersey Division of Rate Counsel. ESRG No. 82-43/2.

Energy Systems Research Group. 1983. *Long Island Without the Shoreham Power Plant: Electricity Cost and System Planning Consequences*. ESRG No. 83-14/S.

Energy Systems Research Group. 1983. *A Technical Report to the Staff of the District of Columbia Public Service Commission on the Benefits to Ratepayers of the Electric Power Research Institute and Gas Research Institute Programs.*, ESRG No. 83-11.

Energy Systems Research Group. 1982. *Customer Programs to Moderate Demand Growth on the Arizona Public Service Company System: Identifying Additional Cost-Effective Program Options*. ESRG No. 82-14.

Energy Systems Research Group. 1982. *The Economics of Alternative Space and Water Heating Systems in New Construction in the New Jersey Power and Light Service Area*. Prepared for the Public Advocate. ESRG No. 82-31.

Energy Systems Research Group. 1982. *Report on Electricity Conservation in the State of Vermont: Assessing the Potential and Developing Program Strategies*. Prepared for the Department of Public Service. ESRG No. 82-23.

Energy Systems Research Group. 1982. *Long-Range Forecast of Electric Loads in the State of Vermont*. ESRG No. 82-16.

Energy Systems Research Group. 1982. *The Economics of Closing the Indian Point Nuclear Power Plants*. ESRG No. 82-40.

Energy Systems Research Group. 1982. *Priority Residential Customer Programs to Conserve Electricity and Gas in the Public Service Electric and Gas Company Area*. Prepared the Division of Rate Counsel for New Jersey Board of Public Utilities. ESRG No. 82-43.

Energy Systems Research Group. 1982. *The Impacts of Early Retirement of Nuclear Power Plant: The Case of Maine Yankee*. ESRG No. 82-91.

Energy Systems Research Group. 1982. *Long Range Forecast of Atlantic City Electric Company Electric Energy and Peak Demand*. Prepared for the New Jersey Board of Public Utilities. ESRG No. 82-17/1.

Energy Systems Research Group. 1982. *A Power Supply and Financial Analysis of the Seabrook Nuclear Station as a Generation Option for the Maine Public Service Company*. Prepared for the Staff of the Maine Public Utilities Commission.

Energy Systems Research Group. 1982. *Long Range Forecast of Detroit Edison Company Electric Energy Requirements and Peak Demands*. Prepared for the Michigan Public Service Commission. ESRG No. 81-60/2.

Energy Systems Research Group. 1982. *Long Range Forecast of Consumer's Power Company Electric Energy Requirements and Peak Demands*. Prepared for the Michigan Public Service Commission. ESRG No. 81-60.

Energy Systems Research Group. 1982. *A Conservation Case Forecast of Electric Energy Consumption and Peak Demand in the Sierra Power Company Service Area*. ESRG No. 81-42/2.

Energy Systems Research Group. 1981. *Maine Public Service Company's Electric Energy Requirements and Peak Demands*. Prepared for the Maine Public Utilities Commission. ESRG No. 81-61.

Energy Systems Research Group. *A Conservation Investment Scenario for the Northeast Utilities Connecticut Service Area*. ESRG No. 81-12/1.

Energy Systems Research Group. 1981. *The Conservation Investment Alternative for New York State*. ESRG No. 80-42.

Energy Systems Research Group. 1981. *A Conservation Investment Program for Alabama Power Company*. Prepared for the Alabama Public Service Commission. ESRG No. 80-62/2.

Energy Systems Research Group. 1981. *A Conservation Investment Strategy for Utah Power and Light Company: Cost- Benefit Analysis*. Prepared for the Public Service Commission of Utah (Case No. 80-035-17). ESRG No. 81-06.

Energy Systems Research Group. 1980. *The Conservation Alternative to the Power Plant at Shoreham, Long Island*. ESRG No. 80-31.

PAPERS

Ackerman, F., P. Knight, B. Biewald. 2016. "Estimating the Cost of Saved Energy: The EIA 861 Database." Synapse Energy Economics.

Knight, P., S. Fields, P. Luckow, T. Vitolo, B. Biewald, E. A. Stanton. 2015. "How Clean Power Will Save Us Money in the Long Run." Brief prepared by Synapse Energy Economics.

Knight, P., P. Luckow, S. Fields, T. Vitolo, B. Biewald, E. A. Stanton. 2015. "Clean Power Means Lower Bills for Consumers." Brief prepared by Synapse Energy Economics.

Vitolo, T., P. Luckow, S. Fields, P. Knight, B. Biewald, E. A. Stanton. 2015. "Lower Electric Costs in a Low-Emission Future." Brief prepared by Synapse Energy Economics.

Knight, P., S. Fields, P. Luckow, T. Vitolo, S. Jackson, B. Biewald, E. A. Stanton. 2015. *Bill Savings in a Clean Energy Future, Part 2. Clean Power Plan Rule Update*. Synapse Energy Economics.

-
- Knight, P., P. Luckow, S. Fields, T. Vitolo, S. Jackson, B. Biewald, E. A. Stanton. 2015. *Bill Savings in a Clean Energy Future: Clean Power Means Lower Bills for States*. Synapse Energy Economics.
- Schlissel, D. and B. Biewald. 2008. *Nuclear Power Plant Construction Costs*. Synapse Energy Economics.
- Hornby, R., W. Steinhurst, and B. Biewald. 2007. *Whitepaper on Least Cost Electricity Procurement in Rhode Island*. Synapse Energy Economics.
- Johnston, L., E. Hausman, A. Sommer, B. Biewald, T. Woolf, D. Schlissel, A. Rochelle, and D. White. 2007. *Climate Change and Power: Carbon Dioxide Emissions Costs and Electricity Resource Planning*. Synapse Energy Economics.
- Peterson, P., D. White, A. Roschelle, and B. Biewald. 2004. *Capacity for the Future: Kinky Curves and Other Reliability Options*. Synapse Energy Economics.
- Biewald, B., and G. Keith. 2004. "Estimating Emission Reductions from Energy Efficiency in the Northeast." Paper presentation at ACEEE 2004 Summer Study in Pacific Grove, CA, August 22 – 27, 2004.
- Biewald, B. and D. White. 1998. "Implications of Premature Nuclear Plant Closures: Funding Shortfalls for Nuclear Plant Decommissioning and Spent Fuel Transportation and Storage." Paper presentation for the 19th Annual North American Conference of the United States Association for Energy Economics and International Association for Energy Economics in Albuquerque, NM, October 1998.
- Biewald, B., and J.A. Ramey. 1997. "Green Electricity: Tracking Systems for Environmental Disclosure," Proceedings of the American Wind Energy Association's annual conference, *WINDPOWER '97*. Austin, Texas.
- Biewald, B., 1996. "Electric Industry Restructuring and Environmental Sustainability." Proceedings of the United States Association for Energy Economics and International Association for Energy Economics, 17th North American Conference on (De)regulation of Energy in Boston, MA, October 1996.
- Singh, D., and B. Biewald. 1996. "Residential Real-Time Metering Technology for Electricity Restructuring." Paper presentation at the National Training and Information Center conference in Chicago, IL, September 1996.
- Biewald, B. 1996. "Competition and Environmental Impacts in the U.S. Electric Sector: Must Market Forces be Tamed?" Paper presentation at the International Society of Ecological Economics conference in Boston, MA, August 1996.
- Biewald, B. 1996. "Stranded Risk: Nuclear Power Issues in Electricity Restructuring." Paper presentation for Energy Advocates meeting in Austin, TX, May 1996.
- Bernow, S., B. Biewald, W. Dougherty, and D. White. 1995. "Counting the Costs: Scientific Uncertainty and Valuation Perspective in EXMO." Paper presentation at technical meeting of the International Atomic Energy Agency in Vienna, Austria, December 4 – 8, 1995.

Bernow, S., B. Biewald, and P. Raskin. 1994. "From Social Costing to Sustainable Development: Beyond the Economic Paradigm." Proceedings of an International Conference, September 8 –11, 1992, *Social Costs of Energy: Present Status and Future Trends*, O. Hohmeyer and R. Ottinger, eds. Racine, Wisconsin: Springer-Verlag.

Bernow, S., B. Biewald, D. Singh, and J. Hall. 1994. "Modeling Renewable Electric Resources: A Case Study of Wind." Proceedings of the Ninth NARUC Biennial Regulatory Information Conference in Columbus, OH, September 7 – 9, 1994.

Singh, D., and B. Biewald. 1994. "Alternative Closed Cycle Cooling Systems for Power Plants: A Framework of Evaluation in Integrated Resource Planning." Proceedings of the Ninth NARUC Biennial Regulatory Information Conference in Columbus, OH, September 7 – 9, 1994.

Fulmer, M., and B. Biewald "Misconceptions, Mistakes and Misnomers in DSM Cost-Effectiveness Analysis, Or What Do You Really Mean By T.R.C.?" Paper presentation at ACEEE 1994 Summer Study in Pacific Grove, CA, August 28 – September 2, 1994.

Bernow, S., B. Biewald, and D. Singh. 1994. "Modeling Renewable Electric Resources: A Case Study of Wind Power." Paper presentation at WINDPOWER 1994 conference sponsored by American Wind Energy Association in Minneapolis, MN, May 9 – 13, 1994.

Bernow, S., B. Biewald, M. Fulmer, T. Woolf, K. Wulfsberg, and B. Solomon. 1994. "National Climate Change Policy and Clean Air Act Compliance: A Case Study of Combined CO₂/SO₂ Reduction." Proceedings of NARUC's 5th National Conference on Integrated Resource Planning in Kallispell, MT, May 15-18, 1994.

Bernow, S., B. Biewald, and D. Singh. 1993. "Modeling Renewable Electric Resources: A Case Study of Wind Reliability." Paper presentation at the NARUC-DOE National Regulatory Conference on Renewable Energy in Savannah, GA, October 3 – 6, 1993.

Bernow S., and B. Biewald. 1993. "Environmental Sustainability as a Goal in Resource Planning and Policy." Paper presentation at the Office of Technology Assessment workshop in Washington, DC, April 1993.

Biewald, B. and S. Bernow. 1992. "Climate Change and the U.S. Electric Sector." Paper presentation at NARUC's 4th National Conference on Integrated Resource Planning in Burlington, VT, September 1992.

Bernow, S., B. Biewald, and K. Wulfsberg. 1992. "Coordinating Clean Air Act Compliance with Integrated Resource Planning: The Role of Externalities." Paper presentation at the Eighth NARUC Biennial Regulatory Information Conference at Ohio State University, Columbus, OH, September 9 – 11, 1992.

Bernow, S., F. Ackerman, B. Biewald, M. Fulmer, K. Shapiro, and K. Wulfsberg. 1992. "Direct Environmental Impacts of Demand-Side Management." Paper presentation at American Council for an Energy Efficient Economy (ACEEE) 1992 Summer Study, September 1992.

Bernow, S. and B. Biewald. 1993. "Modeling Fuel Cycle and Site-Dependent Environmental Impacts in Electric Resource Planning." Invited paper and proceedings at OECD-IEA Expert Workshop on Life-Cycle Analysis of Energy Systems in Paris, France, May 18 –19, 1992. Paris: OECD/IEA.

Bernow, S., B. Biewald, D. Marron. 1991. "Environmental Externalities Measurement: Quantification, Valuation and Monetization" Proceedings of a German-American workshop at Ladenburg, FRG, October 23 – 25, 1991, *External Environmental Costs of Electric Power*, O. Hohmeyer and R Ottinger, eds. Berlin: Springer-Verlag.

Biewald, B. 1991. "Computer Model Use in Energy Conservation Planning." Paper presentation at the Latin American Energy Organization (OLADE) Seminar on Power Systems Computer Modeling in Quito, Ecuador, September 23 – 25, 1991.

Biewald, B. and H. Salgo. 1991. "Some Microcomputer Tools for Least Cost Integrated Energy Planning: ECO, LEAP and EDB." Paper presentation at workshop on Energy Pricing and Planning in Bratislava, Czechoslovakia, May 21 – 22, 1991.

Bernow, S. and B. Biewald. 1991. "Avoided Emissions and Environmental Dispatch." Paper presentation at Demand-Side Management and the Global Environment conference in Arlington, VA, April 22 – 23, 1991.

Biewald, B. and S. Bernow. 1991. "Environmental Benefits of DSM in New York: Long Island Case Study." Paper presentation at Demand-Side Management and the Global Environment conference in Arlington, VA, April 22 – 23, 1991.

Biewald, B., M. Lazarus, and D. Von Hippel. 1990. "EDB: A Flexible Database System for Energy-Environmental Analysis." Paper presentation at the International Atomic Energy Agency (IAEA) Technical Committee Meeting *Development of a Database for Comparative Health and Environmental Impacts of Various Energy Systems* in Vienna, Austria, October 15 – 19, 1990.

Bernow, S., B. Biewald, and D. Marron. 1990. "Full Cost Economic Dispatch: Recognizing Environmental Externalities in Electric Utility System Operation." Paper presentation at NARUC Conference on Externalities in Jackson Hole, WY, October 1990.

Adelaar, M., and B. Biewald. 1990. "An Assessment of Demand-Side Management Models and Their Use and Applicability in Canadian Utilities." Proceedings of the Canadian Electrical Association Demand-Side Management Conference in Halifax, Nova Scotia, September 1990.

Bernow, S., B. Biewald, and D. Marron. 1990. "Environmental Externalities Measurement: Quantification, Valuation, and Monetization." Proceedings of the Seventh NARUC Biennial Regulatory Information Conference, September 1990.

Biewald, B., and Donald Marron. 1989. *Nuclear Power Economics: Construction, Operation and Disposal*.

Bernow, S., and B. Biewald. 1988. "Electric Utility System Reliability Analysis: Determining the Need for Generating Capacity." Proceedings of the Sixth NARUC Biennial Regulatory Information Conference, September 1988.

ARTICLES

Buonocore, J. J., P. Luckow, G. Norris, J. D. Spengler, B. Biewald, J. Fisher, J. I. Levy. 2015. "Health and climate benefits of different energy-efficiency and renewable energy choices." *Nature Climate Change*, August 2015: doi:10.1038/nclimate2771.

Luckow, P., J. Daniel, S. Fields, E. A. Stanton, B. Biewald. 2014. "CO₂ Price Forecast: Planning for Future Environmental Regulations." *EM Magazine*, June 2014, 57-59.

Biewald, Bruce. 2011. "Energy Planning in Response to Climate Change: Accurate Costs are Critical" *The Bulletin of the Atomic Scientists* July 2011.

Biewald, B., L. Johnston, J. Fisher. 2009. "Co-Benefits Experience and Lessons from the U.S. Electric Sector." *Pollution Atmosphérique* April 2009: 113–120.

Roschelle, A., W. Steinhurst, P. Peterson, and B. Biewald. 2004. "Long-Term Power Contracts: The Art of the Deal." *Public Utilities Fortnightly* August 2004.

Keith, G., B. Biewald, and D. E. White. 2004. "Designing Demand Response Programs in New England to Achieve Air Quality Benefits." *The Electricity Journal* 17 (4):79–87.

White, D., A. Roschelle, P. Peterson, D. Schlissel, B. Biewald, and W. Steinhurst. 2003. "The 2003 Blackout: Solutions that Won't Cost a Fortune." *The Electricity Journal* 16 (9):43–53.

Woolf, T., and B. Biewald. 2000. "Electricity Market Distortions Associated with Inconsistent Air Quality Regulations." *The Electricity Journal* 13 (3):42–49.

Ackerman, F., B. Biewald, D. E. White, T. Woolf, and W. Moomaw. 1999. "Grandfathering and coal plant emissions: the cost of cleaning up the Clean Air Act." *Energy Policy* 27 (15): 929–940.

Biewald, B., D. E. White, and T. Woolf. 1999. "Follow the Money: A Method for Tracking Electricity for Environmental Disclosure." *The Electricity Journal* 12 (4):55–60.

Biewald, B. "Book Review of *U.S. Utility Mergers and the Restructuring of the New Global Power Industry*." *Energy* October 1998.

Woolf., T., and B. Biewald. 1998. "Efficiency, Renewables and Gas: Restructuring as if Climate Mattered." *The Electricity Journal* 11 (1):64–72.

Biewald, B. 1997. "Competition and Clean Air: The Operating Economics of Electricity Generation." *The Electricity Journal* 10 (1):41–45.

Gough, C. A., P. D. Bailey, B. Biewald, J. C. Kuylenstierna and M. J. Chadwick. 1994. "Environmentally Targeted Objectives for Reducing Acidification in Europe." *Energy Policy* 22 (12):1055–1066.

Biewald, B., P. Chernick, and W. Steinhurst. 1994. "Environmental Externalities: Highways and Byways." *NRRI Quarterly Bulletin* 15 (4). Presented at NARUC's 5th National Conference on Integrated Resource Planning, May 15-18, 1994.

Biewald, B., and S. Bernow. 1991. "Confronting Uncertainty: Contingency Planning for Decommissioning," in "Nuclear Decommissioning Economics." Special issue, *The Energy Journal of the International Association for Energy Economics* 12: Chapter 18.

Bernow, S., B. Biewald and D. Marron. 1991. "Full Cost Dispatch: Incorporating Environmental Externalities in Electric System Operation." *The Electricity Journal*, March 1991.

Bernow, S., B. Biewald, and D. Marron. 1990. "Avoided Cost Contracts Can Undermine Least Cost Planning." *Energy Policy*, September 1990.

Biewald, B. 1990. "Do We Really Need Nuclear Generating Companies?" *Public Utilities Fortnightly*, June 1990.

Bernow, S., and B. Biewald. 1987. "Nuclear Power Plant Decommissioning: Cost Estimation for Power Planning and Ratemaking." *Public Utilities Fortnightly*, October 1987.

Bernow, S., B. Biewald and T. Woolf. 1987. "Cost and Performance of Boiling Water Reactors." *Public Utilities Fortnightly*, August 1987.

PRESENTATIONS

Biewald, B. 2018. "Resource Planning: How To Do It, How To Do It Right." ELCON Spring Workshop, April 10, 2018.

Biewald, B. 2017. "Making the Best Case for Clean Energy, Not Coal or Gas." Earthjustice Litigation Training Conference, October 2017.

Biewald, B. 2017. "How to Use Utility Performance Incentive Ratemaking to Deploy Trillions of Dollars of Capital Investment Efficiently and Save the Planet." Presentation at MIT, October 2017.

Biewald, B. 2017. "How to Use Utility Performance Incentive Ratemaking to Deploy Trillions of Dollars of Capital Investment Efficiently and Save the Planet." NASEO Annual Meeting, New Orleans, LA, September 2017.

Biewald, B. 2017. "Cooking the Books: Clean Energy Economics and Modeling for Lawyers and Advocates." Presentation at Decarbonizing the Electric Grid, New Orleans, LA, March 28, 2017.

Biewald, B. 2015 "Clean Power Plan: Bad News, Good News." Presentation at Clean Energy States Alliance Meeting, Boston, MA, September 18, 2015.

Bruce, B. 2015. "Electric Systems & Clean Power Plan State Plan Development." Presentation for EPA Regional Air Division Directors, July 16, 2015.

Biewald, B. 2015. "Planning for 111(d) Compliance with CP3T." Presentation to NARUC Staff Subcommittee on Electricity and Electric Reliability, May 7, 2015.

Biewald, B. 2015. "Electric Utility Risks and Risk Management." Presentation at Energy Finance 2015 in New York, NY, March 18, 2015.

Stanton, E. A., B Biewald, D. Hurley, P. Peterson, T. Vitolo. 2015. "Clean Energy Advocates Bootcamp: Understanding Supply and Demand in New England." Presentation in Cambridge, MA, February 12, 2015.

Biewald, B. 2015. "Energy Efficiency and 111(d)." Presentation at the 2015 NASEO Energy Policy Outlook Conference in Washington, DC, February 5, 2015.

Biewald, B. 2014. "Transitions to a 21st Century Generation System." Presentation at EUCI Annual Hawaii Power Summit, December 3, 2014.

Stanton, E. A., B. Biewald. 2014. "Clean Power Plan: A Toolkit for State Compliance." Presentation at the 2014 NASUCA Annual Meeting in San Francisco, CA, November 18, 2014.

Stanton, E. A., B. Biewald. 2014. "Clean Power Plan: Key Issues for Consumers." Presentation at the 2014 NASUCA Annual Meeting in San Francisco, CA, November 16, 2014.

Biewald, B. 2014. "Protecting Consumers from Bad Utility Planning." Presentation to the Electricity Consumers Resource Council in Washington, DC, October 21, 2014.

Stanton, E. A., S. Jackson, B. Biewald. 2014. "Results of New Analysis: EPA's Proposed 111(d) 'Clean Power Plan' Rule." Presentation to NASUCA members in Cambridge, MA, September 30, 2014.

Biewald, B. 2014. "Tools for 111(d) Compliance Planning." Presentation to the Technical Summit on EPA's Carbon Pollution Standards in Atlanta, GA, August 14, 2014.

Biewald, B. 2014. "Understanding the 111(d) Rule." Presentation to the Midwestern Carbon Rule Advocate Technical Meeting in Chicago, Illinois, July 24, 2014.

Biewald, B. 2014. "The Economics of Coal Generation under Various Environmental Regulatory Scenarios." Presentation to the 11th Annual "Energy in the Southwest" Conference in Santa Fe, New Mexico, June 21, 2014.

Biewald, B. 2014. "EPA Training on Electric Utility Planning." Presentation to the U.S. Environmental Protection Agency in Washington, DC, May 22, 2014.

Biewald, B. 2014. "Coal Asset Valuation Tool (CAVT)." Presentation at the Institute for Energy Economics and Financial Analysis' Coal Finance 2014 Conference in New York City, NY, March 19, 2014.

Biewald, B. 2014. "How the Electric Grid Works: Dispatch, Planning, and Regulation." Guest lecture presentation for MIT Course 11.S946 "Electricity, Economics, and the Environment," February 13, 2014.

Biewald, B. 2014. "The Future of Coal: Economics and Planning." Guest lecture presentation for Harvard Graduate School of Arts and Sciences "Energy 101," January 21, 2014.

Biewald, B. 2013. "Legislative Intervention in Electric Utility Matters." Presentation at NASUCA 2013 in Orlando, FL, November 2013.

Biewald, B. 2013. "NARUC Risk Workshop for Regulators." Presentation at the Mid-Atlantic Conference of Regulatory Commissioners, June 2013.

Biewald, B. 2013. "Integrated resource Planning and the Potential for Energy Efficiency and Renewables." Presentation at Coal Finance 2013 in New York City, NY, March 19, 2013.

Biewald, B. 2013. "Addressing Specific IRP Issues." Presentation at the EUCI Conference, Scottsdale, AZ, January 28, 2013.

Biewald, B. 2012. "Saving Consumers Money by Closing Uneconomic Coal Units." Presentation at the 2012 NASUCA Meetings in Charleston, SC. June 2012.

Biewald, B. 2012. "Utility Regulation and Coal." Presentation at The Public Interest Environmental Law Conference in Eugene, OR, March 2012.

Biewald, B. "Review of Resource Planning around North America: Supply and Demand-Side Resource Planning in ISO/RTP Market Regimes." Presentation at EUCI conference, October 2011.

Biewald, B. 2011. "Economics of Existing Coal Generation and Opportunities for Clean Electricity." Presentation for The Energy Foundation, May 18, 2011.

Hornby R., R. Fagan, and B. Biewald. 2009. "Comments Regarding the Department of Energy's Notice of Intent for the Smart Grid Investment Grant Program." Synapse Energy Economics presentation, May 6, 2009.

Biewald, B. 2008. "The U.S. Power System: Economic and Regulatory Challenges to Reducing Greenhouse Gas Emissions from the World's Largest Machine." Presentation at Design Continuum, December 3, 2008.

Biewald, B. 2008. "Economics of Electric Sector CO2 Emissions Reduction: Making Climate Change Policy that People Can Live With." Presentation at the NASUCA 2008 Annual Meeting, November 18, 2008.

Biewald, B. 2008. "Selected Topics from Avoided Energy Supply Costs in New England 2007 Final Report." Presentation at a MA DPU Technical Session, July 29, 2008.

Biewald, B. 2008. "Prudent Planning and New Coal-Fired Generation." Presentation at the CERES 2008 Conference, April 29, 2008.

Biewald, B. 2008. "Climate Change Policies in the Northeast - Carbon Emission Caps and Energy Cost." Presentation at the ASHRAE Winter Meeting, January 19, 2008.

Biewald, B. 2007. "Efficiency and Renewable Energy for Carbon Constrained Electric Systems 2007." Presentation at the NASUCA Annual Meeting in Anaheim, CA, November 12, 2007.

Biewald, B. "Air Emissions Issues Associated DER in the Mid-Atlantic Region." Presentation at the Mid-Atlantic State Energy and Environment Workshop on Distributed Energy Resources, September 27, 2007.

Biewald, B. 2007. "Exploration of Costs for Load Side and Supply Side Carbon Caps for California." Presentation at the Joint En Banc Hearing of PUC and CEC on Point of Regulation in the Electricity Sector (R.06-04-009), August 21, 2007.

Biewald, B. 2006. "Portfolio Management: Tools and Practices for Regulators." Presentation at the NARUC 2006 Summer Meeting in San Francisco, CA and the Annual Convention in Miami, FL, July 2006 and November 2006.

Biewald, B. 2006. "Electricity Price Increases: Causes, Effects, and Solutions." Presentation at the Restructuring Roundtable, May 19, 2006.

Biewald, B. 2006. "Forecasting and Using Carbon Prices in a World of Uncertainty." Presentation to Electric Utilities Environmental Conference in Tucson, AZ, January 22, 2006.

Biewald, B. 2005. "Energy Efficiency in the Northeast." Presentation at ACEEE National Conference on Energy Efficiency as a Resource in Berkeley, CA, September 27, 2005.

Biewald, B. 2004. "The Shape of Things to Come: Incorporating Unproven Reserves of Efficiency Savings into Energy Models." Presentation to the East Coast Energy Group in Washington, DC, November 10, 2004.

Biewald, B. 2004. "Displaced Emissions from Renewables and Efficiency in the Northeast United States." Presentation at a workshop convened by the Commission for Environmental Cooperation, the US Environmental Protection Agency, and the World Resources Institute in Washington DC, November 4, 2004.

Biewald, B. 2004. "Electric Transmission Technical and Policy Issues." Presentation at National Association of State Utility Consumer Advocates conference in Austin, TX, June 14, 2004.

Biewald, B. 2004. "Incorporating Renewable Generation into a Risk Management Strategy." Presentation at the New England Conference of Public Utility Commissioners Symposium in Brewster, MA, May 25, 2004.

Biewald, B. 2004. "Electricity Portfolio Management." Presentation at Beyond 2006 – Illinois State University Institute for Regulatory Policy Studies Conference in Springfield, IL, May 20, 2004.

Biewald, B. 2004. "Electricity Risk Management: Diversified Resource Portfolios." Presentation at Electric Power Supply Association Meeting in Washington, DC, May 6, 2004.

Biewald, B. 2004. "Quantifying Emission Reductions from Local Government Actions." Presentation to Metropolitan Washington Council of Governments Energy and Air Quality Conference in Washington DC, April 5, 2004.

Biewald, B. 2004. "Electricity Portfolio Management." Presentation to National Association of Regulatory Utility Commissioners' Conference in Washington, DC, March 9, 2004.

Biewald, B. 2003. "Portfolio Management for Electricity." Presentation at the Regulatory Assistance Project's portfolio management workshop in Chicago, IL, September 18, 2003.

Biewald, B. 2003. "Issues in Estimating Electric System Displaced Emissions." Presentation at the Commission for Environmental Cooperation Technical Meeting on Approaches to Estimating Environmental Benefits of Renewable Energy and Energy Efficiency in Washington, DC, July 27, 2003.

Biewald, B. 2002. "Best Practices in Market Monitoring and Mitigation." Presentation at the National Association of State Utility Consumer Advocates Mid-Year Meeting in Austin, TX, June 16, 2002.

Biewald, B. 2001. "Regulation of Waste Management at Large Electric Utilities: Modeling Industry Impacts." Presentation for the US Environmental Protection Agency, August 7, 2001.

Biewald, B. 2001. "Quality of Service in Performance-Based Regulation: US Experiences." Presentation at the Seminar on Regulation of Electricity Supply Quality in Milan, Italy, June 8, 2001.

Biewald, B. 2001. "Demand Response in Electricity Markets." Presentation at National Association of State Utility Consumer Advocates Mid-Year Meeting in Santa Fe, NM, June 18, 2001.

Biewald, B. 2001. "Repowering the Midwest: The Clean Energy Development Plan for the Heartland." Presentation at the National Wind Coordinating Committee Upper Midwest Transmission Workshop in Minneapolis, MN, May 1, 2001.

Biewald, B. 2001. "Observations on New England's Electricity Markets." Presentation at the National Regulatory Research Institute Market Power Conference in Columbus, OH, April 10, 2001.

Biewald, B. 2000. "Derailing Coal: The Economics of Coal-Fired Electricity Generation in the US." Presentation at Tax Shift Strategy Meeting in Washington, DC, December 2, 2000.

Biewald, B., and H. Learner. 2000. "Repowering the Midwest: A Clean Energy Development Plan for the Heartland." Presentation at the National Association of Regulatory Utility Commissioners Annual Meeting in San Diego, CA, November 14, 2000.

Biewald, B. 2000. "Electricity in New England: Market Imperfections of Failure?" Presentation at National Association of State Utility Consumer Advocates Annual Meeting in San Diego, CA, November 13, 2000.

Biewald, B. 1999. "How Green is Green? Verifying Energy Advertising Claims." Presentation at the New England Conference of Public Utility Commissioners Symposium in Bretton Woods, NH, May 25, 1999.

Biewald, B. 1999. "Consumer Perspectives on Market Power – Case Studies from New England, New York, PJM, and Mississippi." Presentation at IBC Conference on Market Power in Washington DC, May 24, 1999.

Biewald, B. 1998. "Grandfathering and Environmental Comparability." Presentation at the National Association of Regulatory Utility Commissioners 1998 Summer Committee Meetings in Seattle, WA, July 26, 1998.

Biewald, B. 1998. "Tracking Electricity in the New England Market." Presentation at the National Association of Regulatory Utility Commissioners 1998 Summer Committee Meetings in Seattle, WA, July 26, 1998.

Biewald, B. 1998. "Tracking Electricity in the New England Electricity Market." Presentation at the National Council on Competition and the Electricity Industry National Executive Dialogue on Customers' Right to Know in Chicago, IL, May 13, 1998.

Biewald, B. 1998. "Comparable Environmental Regulations in a Restructured Electricity Industry: The Grandfathering Effect." Presentation at the National Association of Regulatory Utility Commissioners meeting in Washington, DC, March 1, 1998.

Biewald, B. 1998. "Market Power in Electricity Generation." Presentation at the National Consumer Law Center Conference in Washington, DC, February 9, 1998.

Biewald, B. 1997. "Electricity Market Power in New England." Presentation at the Massachusetts Electric Industry Restructuring Roundtable in Boston, MA, December 15, 1997.

Biewald, B. 1997. "Wind Power Development and Air Quality." Presentation at the National Wind Coordinating Committee New England Wind Issues Forum in Boston, MA, November 7, 1997.

Biewald, B. 1997. "Market Power." Invited speaker at the National Association of State Utility Consumer Advocates meeting in Boston, MA, November 12, 1997.

Biewald, B. 1997. "Distortions to Future and Current Competitive Electric Energy Markets Due to Grandfathering Environmental Regulations of Electric Power Plants." Presentation at the National Association of Regulatory Utility Commissioners meeting in Boston, MA, November 9, 1997.

Biewald, B. 1997. "Electric Industry Restructuring as if the Environment Mattered." Presentation for the Boston Area Solar Energy Association, October 9, 1997.

Biewald, B. 1997. "Modeling Market Power in Electricity Generation." Invited speaker at the National Association of Regulatory Utility Commissioners meeting in San Francisco, CA, July 22, 1997.

Biewald, B. 1997. "Performance-Based Regulation in a Restructured Electric Industry." Presentation at National Association of Regulatory Utility Commissioners meeting in San Francisco, CA, July 20, 1997.

Biewald, B. 1997. "State Initiatives and Regional Issues." Presentation at the New England Governors' Conference Workshop on Restructuring and Environmentally Sustainable Technologies in Warwick, RI, March 25, 1997.

Biewald, B. 1996. "Stranded Costs." Invited speaker at the National Association of State Utility Consumer Advocates meeting in San Francisco, CA, November 1996.

Biewald, B. 1996. "Nuclear Power Plant Decommissioning Costs and Electricity Restructuring." Presentation at the Nuclear Decommissioning Trusts Conference in New York City, November 18, 1996.

Biewald, B. 1996. "Stranded Costs." Invited speaker at the Indiana Utilities Regulatory Commission Forum in Indianapolis, IN, November 1, 1996.

Biewald, B. 1996. "Electric Industry Restructuring and the Environment." Presentation at the Indiana Energy Conference in Indianapolis, IN, October 10, 1996.

Biewald, B. 1996. "Small Customers in a Restructured Electricity Industry: Transaction Costs, Advanced Metering Technologies and Aggregation Options." Presentation at the Consumers' Energy Conference in South Portland, ME, July 1996.

Biewald, B. 1996. "Electric Generation Market Power in New England." Presentation at the New England Conference of Public Utility Commissioners in Manchester Village, VT, May 1996.

Biewald, B. 1996. "Advanced Metering for Residential Customers on Electricity Restructuring." Presentation at the National Consumer Law Center's 10th Annual Conference in Washington, DC, February 1996.

Biewald, B. 1996. "Market Power," "Environmental Aspects of Restructuring," and "Market Access for Small Customers." Presentations at Vermont Public Service Board workshops on electricity restructuring, January and February 1996.

Biewald, B. 1995. "Environmental Impacts of Energy: Sustainability and Social Costing." Presentation at the British Columbia Utilities Commission Workshop, Vancouver, BC, March 1995.

Biewald, B. 1995. "Competition and Economic Efficiency." Presentation at the National Council on Competition and the Electric Industry, December 1995.

Biewald, B. 1993. "Compliance Planning Under Regulatory Uncertainty." Presentation at the US Environmental Protection Agency Opportunities Conference: Energy Efficiency and Renewable Energy in Washington, DC, June 1993.

Biewald, B. 1993. "Energy and Sustainability." Presentation at the Hydro-Quebec Conference at Hampshire College in Amherst, MA, April 1993.

Biewald, B. 1992. "Environmental Externalities." Invited speaker at ASME ECO World Conference in Washington, DC, June 1992.

Biewald, B. 1992. Invited speaker before the Association of Energy Engineers in Boston, MA, February 1992.

Biewald, B. 1991. "Acid Rain Abatement Optimization Model." Presentation to the Swedish Environmental Protection Agency in Solna, Sweden, November 1991.

Biewald, B. 1990. "Integrated Resource Planning." Presentation before the Boston Gas Company, July 1990.

Biewald, B. 1990. "Methods for Calculating Electric System Avoided Costs." Training provided to energy planners and policy makers from five Southeast Asian countries sponsored by US Agency for International Development and administered by the Institute of International Education, May 1990.

Biewald, B. 1988. Invited Speaker at the National Association of State Utility Consumer Advocates Mid-Year Meeting in Annapolis, MD, June 1988.

Biewald, B. 1988. Invited Speaker at the Conference on New Developments in Nuclear Decommissioning Costs and Funding Methods sponsored by the Northeast Center for Professional Education in Washington, DC, April 1988.

TESTIMONY

U.S. Subcommittee on Energy and Power: Written Statement of Bruce Biewald, "Benefits of and Challenges to Energy Access in the 21st Century: Electricity." February 27, 2014.

Missouri Public Service Commission (CASE NO.: ER-2012-0174): Surrebuttal Testimony Regarding the Retirement or Retrofit of the LaCygne and Montrose Generating Stations. On behalf of Sierra Club. October 2012.

United States Court of Appeals for the District of Columbia Circuit (Case 11-1375) Southwestern Public Service Company v. U.S. Environmental Protection Agency and Lisa P. Jackson, Administrator, U.S. Environmental Protection Agency: Declaration on the use of probabilistic computer models to properly analyze system reliability, with regard to the Cross-State Air Pollution Rule (CSAPR). On behalf of Sierra Club. October 27, 2011.

United States Court of Appeals for the District of Columbia Circuit (Case 11-1315) United States Environmental Protection Agency v. Luminant Generation Company, LLC: Declaration on the use of probabilistic computer models to properly analyze system reliability, with regard to the Cross-State Air Pollution Rule (CSAPR). On behalf of Sierra Club. October 6, 2011.

Nova Scotia Utility and Review Board: Testimony in the matter of an Application of Nova Scotia Power Incorporated for approval of certain revisions to its Rates, Charges, and Regulations regarding community-based feed-in tariffs for renewable energy. On behalf of The Nova Scotia Utility Review and Board Staff. August 7, 2008.

United States District Court for the Middle District of Louisiana (Civil Action No. 09-CV-100-RET-CN) United States v. Louisiana Generating LLC: Rebuttal report and deposition on the use of computer models for electric system planning and projections of generating unit operations, including PROMOD simulation of power system dispatch. October 2010 and January 2011.

United States District Court for the Eastern District of Michigan (Case 2:10-cv-13101-BAF-RWS) United States v. DTE Energy Company: Declarations on the use of computer models for electric system planning and projections of generating unit operations. June 2010 and November 2010.

United States District Court for the North District of Alabama (Civil Action No. 2:01-CV-00152-VEH)

United States v. Alabama Power Company: Expert report, rebuttal report, and deposition on the use of computer models for electric system planning and projections of generating unit operations. December 2009, June 2010, and May 2010.

United States District Court for the Eastern District of Kentucky, Lexington Division (Case 5:05-cv-0075-KSF) United States v. Kentucky Utilities Company: Expert report on use of computer models for electric system planning, capital investment planning and economic analysis, and projections of generating unit operations. October 2008.

Nova Scotia Utility and Review Board: Review of rate case issues; power plant depreciation and load forecasting. On behalf of The Nova Scotia Utility and Review Board Staff. August 2008.

Nova Scotia Utility and Review Board: Filed evidence reviewing of Nova Scotia Power Inc.'s demand-side management plan. On behalf of The Nova Scotia Utility and Review Board Staff. March 17, 2008.

Indiana Utility Regulatory Commission (Cause Nos. 43114 and 43114S1): Direct and cross testimony regarding the Review of IGCC Plant Proposal by Duke Energy Indiana and Vectren. On behalf of Citizens Action Coalition of Indiana, Save the Valley, Valley Watch, and Sierra Club. May 2007.

California Public Utilities Commission (Docket No. R.06-02-013): Joint testimony with William Steinhurst and Rick Hornby on electric utility long-term planning and procurement, including procurement strategy, treatment of carbon dioxide emissions, credit and collateral policies, customer risk tolerance, and resource needs. March 2007.

New Jersey Board of Public Utilities (Docket No. EM05020106): Joint direct, surrebuttal, and supplemental testimony with Bob Fagan and David Schlissel on the market power implications of the proposed merger between Exelon Corp. and Public Service Enterprise Group. On behalf of New Jersey Division of the Rate Counsel Staff. November 2005, December 2005, and March 2006.

Indiana Utility Regulatory Commission (Cause Nos. 42861): Vectren (SIGECO) environmental compliance planning, including climate change policy and carbon price forecasting, energy efficiency and renewables as compliance options, and cost recovery issues. October 2005.

United States District Court for the Eastern District of Kentucky, Lexington Division (Civil Action No.04-34-KSF) United States v. East Kentucky Power Cooperative: Expert report on state regulation of electric utilities, use of computer models for system planning, capital investment planning and economic analysis, and projections of generating unit operations. September 2005.

United States District Court for the Southern District of Indiana (Civil Action No.IP99-1693 C-M/S)

United States v. Cinergy: Expert report and rebuttal report on state regulation of electric utilities, forecasting sales and resource requirements, use of computer models for system planning, capital investment planning and economic analysis, projections of generating unit operations, and the relationship between generator availability and output. May 2005 and September 2005.

Federal Energy Regulatory Commission (Docket No. EC05-43-000): Joint affidavit with David Schlissel regarding market power analysis of the proposed merger of Exelon Corporation and Public Service Enterprise Group Incorporated. On behalf of New Jersey Division of the Ratepayer Advocate. April 2005.

Nuclear Regulatory Commission Atomic Safety and Licensing Board (Docket No. 52-007-ESP and ASLBP No. 04-821-01-ESP): Affidavit on the environmental impacts and economic costs of a proposed new nuclear power project and alternatives. On behalf of Environmental Law and Policy Center. April 2005.

Indiana Utility Regulatory Commission (Cause Nos. 42622 and 42718): Public Service Company of Indiana environmental compliance planning, including cost estimates for emission control technologies, climate change policy and carbon price forecasting, energy efficiency and renewables as compliance options, power plant retirement economics, and cost recovery issues. March 2005.

National Research Council, Division on Engineering and Physical Sciences, Board on Energy and Environmental Systems (Project No. BEES-J-03-03-A): Alternatives for replacing the generation of the Indian Point Energy Center nuclear facility. March 2005.

Georgia Public Service Commission (Docket No. 18300-U): Georgia Power Company's cost of service study, treatment of electrical distribution equipment, and proposed rates for the Metropolitan Atlanta Rapid Transit Authority. October 2004.

Maine Public Utilities Commission (Docket No. 2004-147): Filed joint expert report *Reply Comments in Docket No. 2004-147: Strategies for Procuring Residential and Small Commercial Standard Offer Supply in Maine* with Amy Rochelle and Paul Peterson. On behalf of the Maine Office of Public Advocate. April 21, 2004.

Texas Public Utility Commission (Docket No. 29526): Testimony and rebuttal testimony regarding issues in CenterPoint Energy Houston Electric LLC's true up filing, including environmental cleanup costs, excess mitigation credits, and construction work in progress. June 2004.

Texas Public Utility Commission (Docket No. 28818): Testimony regarding the Independent Transmission Operator proposal of Energy Gulf States Utilities, Inc. On behalf of The Office of Public Utility Counsel of Texas. April 2004.

Indiana Utility Regulatory Commission (Cause No. 42359): Testimony regarding the Public Service Company of Indiana rate making issues including the impact of trackers on risks to shareholders and customers, costs of environmental compliance, treatment of merchant plant investment and risk, and joint dispatch issues. On behalf The Citizen Action Coalition of Indiana. August 2003.

Nevada Public Utilities Commission (Docket No. 03-1014): Review of Sierra Pacific Power Company's risk management and procurement of electric power in the wholesale markets. April 2003.

Nevada Public Utilities Commission (Docket No. 02-11021): Review of Nevada Power Company's risk management and procurement of electric power in the wholesale markets. March 2003.

United States District Court for the Southern District of Illinois (Civil Action No. 99-833-MJR, United States v. Illinois Power Company and Dynegy Midwest Generation, Inc.): Expert rebuttal report and testimony regarding analysis and opinions on use of computer models for system planning, projections of generating unit operations, and the relationship between generator availability and output. October 2002 and August 2003.

State of Vermont, Windham Superior Court (Appeal of USGen New England, Inc. from 2001 Property Valuation by the Town of Rockingham): Electricity market prices and economic valuation of hydroelectric generating plant. September 2002.

United States District Court for the Middle District of North Carolina (Civil Action No. 1:00 CV 1262, United States v. Duke Energy Corporation): Joint expert report with Phil Hayet on use of computer models for system planning, projections of generating unit operations, and the relationship between generator availability and output. August 2002.

Indiana Utility Regulatory Commission (Cause No. 41746): Reply testimony on a rate case settlement agreement, dealing with issues including NiSource's financial condition, service quality, environmental commitment, and electric rate impacts. July 2002.

Connecticut Department of Public Utility Control (Docket No. 00-12-13RE01): Market power issues and market modeling regarding the proposed sale of Seabrook Nuclear Station to FPL Energy Seabrook, LLC. July 2002.

United States District Court for the Southern District of Indiana (Civil Action No. IP99-1692-C-M/S, United States v. Southern Indiana Gas and Electric Company): Declaration on confidential business information and competitive harm. June 2002.

Nevada Public Utilities Commission (Docket No. 02-2002): Review of Sierra Pacific Power Company's risk management and procurement of electric power in the wholesale markets. April 2002.

Vermont Public Service Board (Docket No. 6596): Used and useful policy issues, electricity market prices, and above market costs of the purchase from Hydro Quebec. March 2002.

Nevada Public Utilities Commission (Docket No. 01-11029): Review of Nevada Power Company's risk management and procurement of electric power in the wholesale markets. February 2002.

Vermont Public Service Board (Docket No. 6545): Economic analysis of the proposed sale of Vermont Yankee nuclear plant and an associated Purchased Power Agreement. January 2002.

New Jersey Board of Public Utilities (Docket No. EM01050308): Joint testimony with David Schlissel and surrebuttal testimony regarding the analysis of the proposed merger between Conectiv and PEPCo. On behalf of The State of New Jersey Division of the Ratepayer Advocate. September 2001 and November 2001.

Indiana Utility Regulatory Commission (Cause No. 41954): System planning and joint operation in a partially deregulated context. On behalf of Citizens Action Coalition of Indiana. June 22, 2001.

State of Vermont, Windham Superior Court (Dockets S 362-9-99 and S372-9-99): Deposition on electricity market prices and economic valuation of hydroelectric generating plant. May 2001.

Federal Energy Regulatory Commission (Docket No. ER01-200-001): Testimony and cross-answering testimony regarding the termination of the Cinergy Operating Agreement, treatment of merger savings, and affiliate relationships. April 2001.

New Jersey Board of Public Utilities (Docket No. EM00110870): Joint testimony with David Schlissel and supplemental testimony regarding the analysis of the proposed merger between FirstEnergy and GPU. On behalf of The State of New Jersey Division of the Ratepayer Advocate. April 2001.

Vermont Public Service Board (Dockets Nos. 6120 and 6460): Testimony and surrebuttal testimony regarding used and useful policy issues, electricity market prices, and above market costs of the purchase from Hydro Quebec. March 2001 and April.

United States District Court for the Northern District of New York (Civil Action No. 00-CV-1738): Affidavit on the issuance and trading of SO₂ emission allowances under the Title IV of the Clean Air Act, in Clean Air Markets Group v. George E. Pataki et al. January 2001.

Department of Energy (Docket No. EE-RM-500): Oral testimony on proposed rules for central air conditioner and heat pump energy conservation standards. December 2000.

Illinois Commerce Commission (Docket No. 00-0361): Review of ComEd's funding for nuclear power plant decommissioning. July 2000.

California Public Utilities Commission (Rulemaking 99-10-025): Direct and rebuttal testimony regarding distributed generation and related rate design issues. On behalf of On Behalf of The Utility Reform Network, Utility Consumers Action Network, and Natural Resources Defense Council (NRDC). July 2000 and August 2000.

Massachusetts Department of Environmental Protection: Comments on reliability implications of proposed emission standards for power plants. July 2000.

Arkansas Public Service Commission (Docket No. 00-048-R): Requirements for electricity market power analyses. June 2000.

United States District Court for the Middle District of North Carolina (1:99CV00033): Expert report on replacement power costs in Carolina Power & Light Company vs. Yuasa Exide, Inc. March 2000.

Illinois Commerce Commission (Docket No. 99-0115): Review of ComEd's nuclear power plant decommissioning cost estimates. September 1999.

West Virginia Public Service Commission (Case No. 98-0452-E-GI): AEP and Allegheny Power restructuring, market power, divestiture of generation, electric system market price modeling, statistical analysis of comparable sales, and responsibility for stranded costs and gains. On behalf of On Behalf of The Consumer Advocate Division. August 1999.

Mississippi Public Service Commission (Docket No. 96-UA-389): Review of Entergy Mississippi, Inc. and Mississippi Power Company stranded cost filings, divestiture of generation, statistical analysis of comparable sales, responsibility for stranded costs and gains. On behalf of Mississippi Attorney General's Office. August 1999.

Connecticut Department of Public Utility Control (Docket No. 99-03-36): Testimony regarding Connecticut Light and Power Company standard offer service, market prices for electricity and the influence of market power, simulation analysis of the New England electricity market. On behalf of Connecticut Office of Consumer Counsel. July 1999.

Connecticut Department of Public Utility Control (Docket No. 99-03-35): Testimony regarding United Illuminating Company standard offer service, market prices for electricity and the influence of market power, simulation analysis of the New England electricity market. On behalf of Connecticut Office of Consumer Counsel. July 1999.

Utah Public Service Commission (Docket No. 98-2035-04): Testimony regarding the cost savings expectations for the proposed merger of PacifiCorp and Scottish Power. On behalf of the Committee of Consumer Services. June 1999.

Washington Utilities and Transportation Commission (Docket No. UE-981627): Direct testimony regarding cost savings expectations for the proposed merger of PacifiCorp and Scottish Power and assessment of whether the merger is in the public interest. On behalf of The Public Counsel Section, Office of the Attorney General. June 1999.

Federal Energy Regulatory Commission (Docket Nos. EC98-40-00, et al.): Horizontal market power and barriers to entry in consideration of the proposed merger of American Electric Power Company and Central and South West Corporation. April 1999.

Connecticut Department of Public Utility Control (Docket No. 99-03-04): Market power, market prices, and simulation modeling as related to the application of United Illuminating Company for recovery of stranded costs. April 1999.

Connecticut Department of Public Utility Control (Docket No. 99-02-05): Market power, market prices, and simulation modeling as related to the application of Connecticut Light & Power Company for recovery of stranded costs. April 1999.

Maryland Public Service Commission (Case No. 8797): Direct testimony regarding the simulation analysis of the ECAR market and projected market prices for electricity for estimation of Potomac Electric Company's stranded generation costs and unbundled rates. On behalf of the Staff of the Public Service Commission of Maryland. January 1999.

Maryland Public Service Commission (Case No. 8795): Direct testimony regarding the simulation analysis of the PJM market and projected market prices for electricity for estimation of Delmarva Power and Light Company's stranded generation costs and unbundled rates. On behalf of the Staff of the Public Service Commission of Maryland. December 1998.

Maryland Public Service Commission (Cases Nos. 8794 and 8804): Direct testimony regarding the simulation analysis of the PJM market and projected market prices for electricity for estimation of Baltimore Gas and Electric Company's stranded generation costs and unbundled rates. On behalf of the Staff of the Public Service Commission of Maryland. December 1998.

Vermont Public Service Board (Docket No. 6107): Prefiled testimony regarding excess capacity, used & useful, and the economics of Green Mountain Power's purchase from Hydro Quebec. On behalf of The Vermont Department of Public Service. September 1998.

Mississippi Public Service Commission (Docket No. 96-UA-389): Direct testimony regarding the analyses of market concentration and market power, behavior of affiliated companies, need for an independent system operator. On behalf of the Mississippi Attorney General's Office. September 1998.

California Public Utilities Commission (Application No. 97-12-020): Testimony and rebuttal testimony regarding nuclear power plant decommissioning and radioactive waste disposal. July 1998 and August 1998.

Federal Energy Regulatory Commission (Docket No. EC97-46-000): Affidavit on market power implications of the proposed merger between Allegheny Power System and Duquesne Light Company. June 1998.

New Jersey Board of Public Utilities (Docket Nos. EX4120585Y, EO97070460, and EO97070463): Joint testimony with Nathanael Greene, Edward Smeloff, and Thomas Bourgeois regarding economic and environmental benefits of energy efficiency, including estimation of marginal air emissions from the PJM System. March 1998.

Vermont Public Service Board (Docket No. 6018): Excess capacity and the economics of Central Vermont Public Service Company's purchase from Hydro Quebec. February 1998.

Public Service Commission of Maryland (Case No. 8774): Market power implications of the APS-DQE merger. February 1998.

Federal Energy Regulatory Commission (Docket Nos. OA97-237-000 and ER97-1079-000): Market power in New England electricity markets. January 1998.

British Columbia Utilities Commission: British Columbia Hydro and Power Authority Wholesale Transmission Services Application. November 1997.

Pennsylvania Public Utility Commission (Docket R-00973981): Environmental disclosure, consumer education, and allocation of default customers in the West Penn Power Company Restructuring Plan. November 1997.

Pennsylvania Public Utility Commission (Docket R-00974104): Direct and surrebuttal testimony regarding environmental disclosure, consumer education, nuclear decommissioning, and allocation of default customers in Duquesne Light Company Restructuring Plan. November 1997 and December 1997.

Mississippi Public Service Commission (Docket No. 97-UA-496): Petition of Mississippi Power Company for a Certificate of Public Convenience and Necessity Authorizing Construction of a Generating Plant in Jackson County. November 1997.

Pennsylvania Public Utility Commission (Docket Nos. R-00973953 and P-00971265): Allocation of default customers in the Application of PECO Energy Company for approval of its restructuring plan and petition on Enron Energy Services Power, Inc. for approval of an electric competition and customer choice plan. November 1997.

Vermont Public Service Board (Docket No. 5983): Direct, rebuttal, and supplemental testimony regarding excess capacity and the economics of Green Mountain Power Company's purchase from Hydro Quebec. October 1997, December 1997, and January 1998.

Pennsylvania Public Utility Commission (Docket No. R-00973953): Testimony regarding environmental disclosure, nuclear decommissioning and spent fuel in the Joint petition for partial settlement of PECO Energy Company's proposed restructuring plan and application for a qualified rate order. September 1997.

Pennsylvania Public Utility Commission (Docket No. R-00974009): Testimony regarding environmental disclosure, customer education, and nuclear issues in Pennsylvania Electric Company's Restructuring Plan. September 1997.

Pennsylvania Public Utility Commission (Docket No. R-00974008): Testimony regarding environmental disclosure, customer education, and nuclear issues in Metropolitan Edison Company's Restructuring Plan. September 1997.

Indiana Legislature, Regulatory Flexibility Committee: Testimony in the matter of Electric Industry Restructuring To Benefit Consumers and the Environment: Stranded Costs, Nuclear Issues, and Air Emissions. September 23, 1997.

Pennsylvania Public Utility Commission (Docket No. R-00973954): Direct and surrebuttal testimony regarding environmental disclosure, customer education, PJM market structure, nuclear decommissioning and spent fuel, rate design for stranded cost recovery in Pennsylvania Power & Light Company's Restructuring Plan. June 1997 and August 1997.

Pennsylvania Public Utility Commission (Docket No. R-00973953): Testimony regarding environmental disclosure, PJM market structure, and nuclear decommissioning and spent fuel in the matter of PECO Energy Company's Restructuring Plan. June 1997.

New York Public Service Commission (Case 96-E-0897): Testimony regarding the analysis of market power in the New York City load pocket in the matter of Consolidated Edison Company's Plans for Electric Rate Restructuring. April 1997.

Pennsylvania Public Utility Commission (Docket No. R-00973877): Testimony regarding the nuclear power plant decommissioning costs, stranded cost recovery, and securitization in the matter of the Application of PECO Energy Company for Issuance of a Qualified Rate Order. February 1997.

New Hampshire Public Utilities Commission (DR 96-150): Electric industry restructuring, including stranded costs, industry structure, market power, and nuclear issues. November 1996.

Massachusetts Department of Public Utilities (96-100): Nuclear plant stranded costs and decommissioning. July 1996.

Vermont Public Service Board (5854): Electric industry restructuring, including stranded costs, industry structure, and environmental protection. July 1996.

Ontario Energy Board (H.R. 23): Filed joint evidence with John Stutz regarding electricity rate options. June 1995.

Pennsylvania Public Utility Commission (R-00943271): Discount rates and system benefits charge. April 1995.

Colorado Public Utilities Commission (94A-516A): Construction of new generating resources. January 1995.

Public Service Commission of Nevada (94-9002): Environmental and health impacts of a proposed power plant. November 1994.

Nuclear Decommissioning Finance Committee of New Hampshire (93-001): Joint testimony with William Dougherty regarding Seabrook decommissioning cost, spent fuel storage, and cost collection methodology. September 1994.

Public Service Commission of Wisconsin (6630-CE-197 and 6630-CE-209): Joint testimony with William Dougherty regarding Point Beach externalities, economics, spent fuel storage, and aging. September 1994.

British Columbia Utilities Commission: Greenhouse gas emissions and environmental externalities policy. August 1994.

Public Service Commission of Wisconsin (05-EI-14): Direct, rebuttal, and surrebuttal testimony regarding the Cost of decommissioning Point Beach and Kewaunee nuclear power plants. February 1994.

Delaware Public Service Commission (91-39): Nuclear and fossil power plant performance targets. September 1992.

Massachusetts Department of Public Utilities (91-131): Internalization of environmental externalities, greenhouse gas valuation and policy. December 1991.

Massachusetts Department of Public Utilities (91-131): Environmental externalities valuation, emissions effects and global warming. October 1991.

Massachusetts Department of Public Utilities (89-141, 90-73, 90-141, 90-194 and 90-270): The incorporation of environmental externalities in specific utility RFPs. December 1990.

Massachusetts Department of Public Utilities (90-55): Costs and benefits of high-efficiency gas heating equipment. June 1990.

Massachusetts Department of Public Utilities (86-36-G and 89-239): Environmental externalities of electric resources. March 1990.

Florida Public Service Commission (890973-E1): Integrated energy planning, power plant emissions, and nuclear plant performance. January 1990.

Pennsylvania Public Utilities Commission (R-891364): Generating capacity requirements of the Philadelphia Electric Company and the Pennsylvania-New Jersey-Maryland Interconnection. October 1989.

Maryland Public Service Commission (8199): Performance standards for coal, oil, and nuclear power plants. October 1989.

Michigan Public Service Commission (U-9172): Testimony regarding economic analysis of ratepayer impacts, incentives, and implications for plant operation and decommissioning in the matter of the Palisades Power Purchase Agreement. April 1989.

Pennsylvania Public Utility Commission (P-870216, P-880283, P-880284, and P-880286): Allegheny Power System planning and avoided costs. March 1989.

Michigan Public Service Commission (U-8880): Detroit Edison Company power supply costs, economics of Fermi “buy-back” purchase, nuclear fuel expense, oil costs, and power transactions. February 1988.

Michigan Public Service Commission (U-8866): Consumers Power Company power supply costs, including projections of oil prices and purchased power costs. December 1987.

Pennsylvania Public Utility Commission (R-850220): Direct and surrebuttal testimony regarding the economic analysis of West Penn Power Company’s participation in the Bath County Pumped Storage Project, and Allegheny Power System capacity reserve requirements. September 1987 and October 1987.

Arizona Corporation Commission (U-1345-85-367): Palo Verde decommissioning cost. February 1987.

Michigan Public Service Commission (U-8545): Consumers Power Company power costs, projected cost of oil and purchased power, economic evaluation of the Big Rock Point nuclear unit. December 1986.

Public Service Commission of Indiana (38045): Northern Indiana Public Service Company system reliability and excess capacity. November 1986.

California Public Utility Commission (84-06-014 and 85-08-025): Diablo Canyon decommissioning cost and collection issues. July 1986.

Michigan Public Service Commission (U-8042R): Review of Consumers Power Company system operations during 1985 and economic evaluation of the Big Rock Point nuclear unit. June 1986.

Michigan Public Service Commission (U-8291): Detroit Edison Company power supply costs, application of a multi-area dispatch model. April 1986.

Michigan Public Service Commission (U-8286): Consumers Power Company power supply costs, application of a multi-area dispatch model. February 1986.

Maine Public Service Commission (85-132): Direct and surrebuttal testimony regarding the standard and long term rates for cogeneration and small power production. January 1986 and February 1986.

Arkansas Public Service Commission (84-249-U): Impact of the Grand Gulf nuclear unit upon Arkansas Power and Light Company and Middle South Utilities electricity production costs. June 1985

Kentucky Public Service Commission (8666): Production costing modeling issues. February 1984.

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