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Dr. Schatzki is an expert in energy and environmental economics and policy, and specializes in the application of microeconomics, econometrics, and data analysis to complex business and policy problems. He has worked with clients on corporate strategy, public policy design, and problems arising in regulation and litigation.

Dr. Schatzki has worked extensively on the design of electricity markets, analysis of wholesale electricity markets, economic analysis of energy and environmental regulations, asset valuation, resource planning and procurement, utility ratemaking and retail electricity markets. He has submitted testimony to both state and federal energy commissions. His research has been supported by organizations such as the Electric Power Research Institute, Edison Electric Institute, Federal Energy Regulatory Commission, and National Association of Regulatory Utility Commissioners. His work has appeared in journals such as the *Journal of Environmental Economics and Management*, the *Electricity Journal*, *Public Utilities Fortnightly*, and *AEI-Brooking Joint Center for Regulatory Studies*. He has also provided litigation support in many cases, including several high profile cases involving alleged wholesale electricity price manipulation and the implications of such manipulation for derivative contracts.

Prior to joining Analysis Group, he had research and consulting affiliations with the Harvard Institute for International Development and the International Institute for Applied Systems Analysis (Vienna, Austria), and was an economist at LECG, LLC and National Economic Research Associates.

**EDUCATION**

1998 Ph.D., Public Policy, Harvard University, Cambridge, MA

Specialized Fields: Microeconomics, econometrics, industrial organization, natural resource and environmental economics

- Doctoral Fellow, Harvard University, Cambridge, MA (1993-1995)
- Crump Fellowship, Harvard University, Cambridge, MA (1995-1996)
- Pre-doctoral Fellow, Harvard Environmental Economics Program

1993 M.C.P., Environmental Policy and Planning (Urban Studies and Planning, ), M.I.T., Cambridge, MA

1986 B.A., Physics, Wesleyan University, Middletown, CT

**PROFESSIONAL EXPERIENCE**

2005-present	Analysis Group, Inc
2001-2005	LECG, LLC, <i>Managing Economist</i>
1998-2001	National Economic Research Associates, Inc., <i>Senior Consultant</i>
1997-1998	Harvard Institute for International Development, <i>Consultant</i>
1996-1997	Department of Economics, Harvard University, <i>Teaching Fellow and Research Assistant</i>
1994	International Institute for Applied Systems Analysis (IIASA)
1992	Toxics Reduction Institute, University of Massachusetts
1987-1991	Tellus Institute, <i>Research Associate</i>

**SELECTED CASE WORK****Energy**

- **ISO New England.** Assessment of the economic costs associated with winter 2013/2014 reliability programs, including oil inventory, dual fuel, liquefied natural gas and demand response programs
- **ISO New England.** Assessment of and testimony regarding the economic and reliability impacts of proposed capacity market rules introducing new performance incentives
- **ITC Midwest.** Analysis of and testimony regarding the LMP and production cost impacts of new transmission infrastructure (using PROMOD)
- **Entergy.** Evaluation of economic damages associated with an alleged contract breach
- **Ameren.** Analysis of the impact of the Illinois River Project, a new transmission project, on energy market competition in Illinois (using PROMOD)
- **Dayton Power and Light.** Evaluation of the aggregate benefits created by a proposed rate plan
- **Corporation with distribution companies across multiple jurisdictions.** Regulatory assessment considering current ratemaking models, regulatory environment and alternative ratemaking structures
- **ISO New England.** Assessment of the costs, feasibility and effectiveness of technical options to securing fuel supply for gas-fired generators
- **ISO New England.** Assessment of reliability risks and potential market and regulatory solutions to electric-gas interdependencies
- **Pacific Gas and Electric.** Assessment of ratemaking issues, including cost of capital adjustments, associated with a gas pipeline safety plan
- **Confidential Technology Company.** Analyzed the regional economic impacts of a prototype biofuels production facility at two potential development sites using the IMPLAN model.
- **ISO New England.** Statistical analysis of the performance of resources responding to system contingencies
- **Direct Energy.** Assistance developing regulatory options for promoting retail competition in Pennsylvania, including development of customer service auctions

- **ISO New England.** Assistance developing design enhancements for the region’s Forward Reserve Markets
- **Confidential Client.** Analysis of energy and capacity market implications of a potential asset agreement (using GE’s Multi-Area Production Simulation Software)
- **Confidential Client.** Analysis of fleet turnover decisions and outcomes (using GE’s Multi-Area Production Simulation Software)
- **Confidential Regulated Utility.** Development of a white paper on transmission planning and policy needed to support legislative and regulatory goals for renewable development
- **Commonwealth Edison.** Analysis of appropriate ratemaking tools (cost of equity adjustment) in light of energy efficiency program requirements
- **New England Power Generators Association.** Analysis of impacts of proposed electric power company merger
- **Confidential Technology Company.** Development of a quantitative model of energy savings associated with end-use technological modifications..
- **Confidential Regulated Utility.** Development of a white paper assessing the potential for alternative ratemaking tools to mitigate multiple utility capital, load and service challenges
- **EDF Group.** Analysis of financial and credit implications of the sale of a portion of power generation assets
- **New England States Committee on Electricity.** Technical support and analysis related to design of regulations and wholesale electricity markets to achieve resource adequacy
- **National Grid Utilities.** Assistance developing ratemaking plans including revenue decoupling and associated revenue adjustments
- **NARUC and FERC.** Analysis of “best practices” in state policies for competitive procurement of retail electricity supply
- **New York ISO.** Analysis of single-clearing-price versus pay-as-bid market designs
- **Confidential System Operator.** Analysis of metrics for characterizing the economic value provided by regional transmission organizations
- **TransCanada.** Assessment of regulatory and finance issues involved in fuel adjustment clauses within long-term standard offer service contracts
- **New York ISO.** Analysis of market implications of fuel diversity issues
- **Confidential.** Analysis of alleged exercise and extension of market power in a wholesale electricity market, including statistical analysis of spot and real-time electricity markets and statistical modeling of outages using hazard model methods to examine potential physical withholding
- **Confidential.** Financial and strategic analysis of gas supply contracting alternatives
- **Confidential.** Analysis of value of generating assets using real options analysis
- **Confidential.** Statistical analysis of prices in the spot and forward markets using time-series methods for an energy trading firm in a federal proceeding related to the reasonableness of the terms of certain forward market contracts
- **Confidential.** Financial and strategic analysis of renewable generation technologies

## Environment

- **Chevron.** Development of a white paper on post-2020 climate policy for California.
- **American Petroleum Institute.** Assessment of issues related to the impact of changes to National Ambient Air Quality Standard Requirements on oil and gas exploration and production
- **Greater Boston Real Estate Board.** Development of a white paper on mandatory building energy labeling/benchmarking policies
- **Little Hoover Commission.** Analysis of the economic and environmental consequences of a local climate policy plan implemented in the context of a state-wide cap-and-trade system
- **Exelon.** Analysis of the economic and market consequences of EPA's Clean Air Transport Rule
- **Chevron.** Assessment of lessons learned from Federal requirements for regulatory review for the potential development of state requirements
- **Western States Petroleum Association and Chevron.** Regulatory support and analysis related to climate policy in California, including submission of various comments and reports to the Air Resources Board
- **Honeywell.** Analysis of proposed limits on HFC consumption under domestic climate policy
- **Electric Power Research Institute.** Analysis of three 2006 studies on the economic impact of meeting the California carbon emissions reduction targets (in the California Global Warming Solutions Act of 2006)
- **Confidential.** Assessment of various policy issues in the design of national climate change policies, including market-based policies, approaches to cost containment, offset projects, and non-CO<sub>2</sub> GHGs
- **Confidential.** Quantitative analysis of the impacts for technology, consumers and asset owners of a market-based domestic climate policy
- **Toyota.** Analysis of the economic value of emissions for a major auto manufacturer associated with alleged non-compliance with emissions control requirements
- **Barajas Airport.** Evaluated the regional economic impacts of runway expansions at the Barajas airport in Spain.

## Finance and Commercial Damages

- Analysis of financial and credit implications of the sale of a portion of power generation assets
- Analysis of bond pricing, transactions and holdings related to default of sovereign bonds
- Analysis of transfers between financial institutions within credit card networks
- Analysis of the impact of product taxes on firm market shares related to determination of payments under a settlement agreement
- Analysis of damages related to breached contract and appropriation of trade secrets in the development of a pharmaceutical product
- Analysis of damages from breach of commodity swap contract (petroleum)
- Analysis of allegations regarding mutual fund day trading, including analysis of trading patterns and calculation of dilution

## Antitrust

- Estimation of damages associated with an alleged monopolization and foreclosure resulting from a distribution agreement (retail consumer products)
- In a price-fixing case across multiple markets in the pharmaceutical industry, estimated overcharges and cartel periods based on a time-series analysis of price data
- Analysis of multiple antitrust claims (including foreclosure, monopolization, and vertical restraints) related to an alleged collusive distribution arrangement (retail consumer product)
- Analysis of alleged tying of aftermarket products and the provision of service, including evaluation of the alleged tie, competitive effects, and damages (office systems)
- Analysis of liability, timing, geographic scope, and damages issues for a petrochemical company facing potential price-fixing charges by DOJ and private parties
- Analysis of tying, monopolization, and patent abuse claims involving a patent licensing scheme for process and instrument patents (scientific equipment)
- Analysis of foreclosure, attempted monopolization of innovation markets, and damages claims arising from the termination of an investment/licensing agreement (medical devices)
- Estimation of damages related to alleged invalid patents and tying of products to patent rights associated with a process patent (scientific equipment)

## ARTICLES AND PAPERS

*Three Lingering Design Issues Affecting Market Performance in California's GHG Cap-and-Trade Program* (with Robert N. Stavins), *Regulatory Policy Program, Mossavar-Rahmani Center for Business and Government, Harvard Kennedy School*, January 2013.

*Using the Value of Allowances from California's GHG Cap-and-Trade System* (with Robert N. Stavins), *Regulatory Policy Program, Mossavar-Rahmani Center for Business and Government, Harvard Kennedy School*, August 27, 2012.

*Implications of Policy Interactions for California's Climate Policy* (with Robert N. Stavins), *Regulatory Policy Program, Mossavar-Rahmani Center for Business and Government, Harvard Kennedy School*, August 27, 2012.

"The Interdependence of Electricity and Natural Gas: Current Factors and Future Prospects," (with Paul Hibbard), *The Electricity Journal*, May 2012.

"California's Cap-and-Trade Decisions," *Forbes.com*, August 19, 2010.

"Competitive Procurement of Retail Electricity Supply: Recent Trends in State Policies and Utility Practices," (with Susan F. Tierney), *The Electricity Journal*, March 2009.

"Pay-as-Bid vs. Uniform Pricing: Discriminatory Auctions Promote Strategic Bidding and Market Manipulation" (with Susan F. Tierney and Rana Mukerji), *Public Utilities Fortnightly*, March 2008.

"Free Greenhouse Gas Cuts: Too Good to Be True?" (with Judson Jaffe and Robert Stavins) *VoxEU.org*, January 3, 2008.

"Too Good to Be True? An Examination of Three Economic Assessments of California Climate Change Policy" (with Robert N. Stavins and Judson Jaffe), *AEI-Brookings Joint Center for Regulatory Studies, Related Publication 07-01*. Jan 2007.

"Options, Uncertainty and Sunk Costs: An Empirical Analysis of Land Use," *Journal of Environmental Economics and Management*, Vol. 46, p. 86-105, 2003.

“The database on the economics and management of endangered species (DEMES),” (with David Cash, Andrew Metrick, and Martin Weitzman) in *Protecting Endangered Species in the United States: Biological Needs, Political Realities, Economic Choices*. Cambridge University Press, 2001

“The Issue of Climate,” *Fundamentals of the Global Power Industry, Petroleum Economist*, 2000.

Review of “Sustainable Cities: Urbanization and the Environment in International Perspective,” *Environmental Impact Assessment Review*, (Vol. 12, No. 4), 1993.

“Bottle Bills and Municipal Recycling,” *Resource Recycling*, June 1991.

## **WORKING PAPERS**

“Can Cost Containment Raise Costs? Allowance Reserves in Practice,” March 2012.

Schatzki, Todd, Paul Hibbard, Pavel Darling and Bentley Clinton, Generation Fleet Turnover in New England: Modeling Energy Market Impacts, June, 2011.

"A Hazard Rate Analysis of Mirant's Generating Plant Outages in California," with William Hogan and Scott Harvey. Presented at the IDEI Conference on Competition and Coordination in the Electricity Sector, Toulouse, France, January 16-17, 2004.

“Estimating Structural Change in Industries with Application to Cartels,” June 2003.

“The Pollution Control and Management Response of Thai Firms to Formal and Informal Regulation,” (with Theodore Panayotou) draft, 1999.

“Differential Industry Response to Formal and Informal Environmental Regulations in Newly Industrializing Economies: The Case of Thailand,” (with Theodore Panayotou and Qwanruedee Limvorapitak), Harvard Institute for International Development 1997 Asia Environmental Economics Policy Seminar, Bangkok, Thailand, February 1997.

“The Effects of Uncertainty on Landowner Conversion Decisions,” John F. Kennedy School of Government, Center for Science and International Affairs, Environment and Natural Resources Program, Discussion Paper 95-14, December 1995.

## **SELECTED PRESENTATIONS**

“Quality and Quantity: Alternatives for Addressing Reliability Concerns from Shifting Resource Mixes,” Center for Research In Regulated Industries 27<sup>th</sup> Annual Western Conference June 26, 2014.

“Climate Policy Choices – RPS, Cap-and-Trade & the Implications for Actions (and Exits) that Affect Emissions,” Electric Utilities Environmental Conference, February 4, 2014.

“Multiple Dimensions of Gas-Electric Coordination Concerns,” Electric Utilities Environmental Conference, February 3, 2014.

“The Economics of Cap-and-Trade in the California Power Markets,” EUCI Conference, California Carbon Policy Impacts on Western Power Markets, January 27, 2014.

“Market-Based Policies to Address Climate Change,” Sustainable Middlesex, May 4, 2013.

“Market Forces and Prospects/Economic Ripple Effects, 5-10 Years Ahead,” Air & Waste Management Association, New England Section, October 12, 2012.

“Gas and Electric Coordination: Is It Needed? If So, To What End?” Harvard Electric Policy Group, Cambridge, MA, October 11, 2012.

“Reliability and Resource Performance,” Center for Research In Regulated Industries 31st Annual Eastern Conference May 16, 2012.

- “Can Cost Containment Raise Costs? Allowance Reserves in Practice,” International Industrial Organization Conference, Boston, MA, April 9, 2011.
- “Ratemaking Mechanisms/Tools as Carrots for Achieving Desirable Regulatory Outcomes,” Conference on Electric Utility Rate Cases, Law Seminars International, Boston, Massachusetts, November 9, 2010.
- “Evolving Issues in Revenue Decoupling: Designs for an Era of Rising Costs,” Center for Research In Regulated Industries 29th Annual Eastern Conference May 19, 2010.
- “Aligning Interest with Duty: Revenue Decoupling as a Key Element of Accomplishing Energy Efficiency Goals,” National Conference of State Legislatures, Fall Forum, December 8, 2009.
- “Federal Proposals to Limit Carbon Emissions and How They Would Affect Market Structures – Regional Trading Programs’ Futures in Light of New Federal Interest in Reducing GHG Emissions,” Energy in California, Law Seminars International, San Francisco, California, September 15, 2009.
- “Current Market, Technology and Regulatory Risks: Impact on Investment and Implications for Policy”, Utility Rate Case, Issues and Strategy 2009, Law Seminars International, Las Vegas, Nevada, February 9, 2009.
- “An Economic Perspective on the Benefits of Going Green,” Harvard Electricity Policy Group, Atlanta, Georgia, December 11-12, 2008.
- “Implications of Current Regulatory, Technology and Market Risks,” Energy in California, Law Seminars International, San Francisco, California, September 22-23, 2008.
- “Competitive Procurement of Retail Electricity Supply: Recent Trends in State Policies and Utility Practices,” National Association of Regulatory Utility Commissioners Summer Committee Meetings, Portland, Oregon, July 20, 2008.
- “Too Good to Be True? An Examination of Three Economic Assessments of California Climate Change Policy, Key Findings and Lessons Learned,” POWER Research Conference on Electricity Markets and Regulation, University of California at Berkeley, March 21, 2008.
- “Preliminary Findings: Study of Model State and Utility Practices for Competitive Procurement of Retail Electric Supply,” National Association of Regulatory Utility Commissioners Annual Meeting, Washington, D.C., February 17, 2008.
- “The ABC’s of California’s AB 32: Issues and Analysis, Cost Analyses and Policy Design” Environmental Market Association Webinar, April 12, 2007.

## **SELECTED CONSULTING REPORTS**

- Beyond AB 32: Post-2020 Climate Policy for California* (with Robert N. Stavins), January 2014.
- Assessment of the Impact of ISO-NE’s Proposed Forward Capacity Market Performance Incentives* (with Paul Hibbard), prepared for ISO New England, September 2013.
- “LMP Impacts of Proposed Minnesota-Iowa 345 kV Transmission Project: Supplemental Analysis,” with Rodney Frame and Pavel Darling, Appendix M, ITC Midwest LLC, Application to the Minnesota Public Utilities Commission for a Certificate of Need, Docket No. ET6675/CN-12-1053, April 9, 2013.
- “LMP Impacts of Proposed Minnesota-Iowa 345 kV Transmission Project,” with Rodney Frame and Pavel Darling, Appendix M, ITC Midwest LLC, Application to the Minnesota Public Utilities Commission for a Certificate of Need, Docket No. ET6675/CN-12-1053, March 22, 2013.
- “Analysis of Reserve Resources: Activation Response following Contingency Events,” prepared for ISO New England, May 29, 2012.

*Economic and Environmental Implications of Allowance Benchmark Choices* (with Robert N. Stavins), prepared for the Western States Petroleum Association, October 2011.

*Next Steps for California Climate Policy II: Moving Ahead under Uncertain Circumstances* (with Robert N. Stavins), prepared for the Western States Petroleum Association, April 2010.

*Options for Addressing Leakage in California's Climate Policy* (with Jonathan Borck and Robert N. Stavins), prepared for the Western States Petroleum Association, February 2010.

*Addressing Environmental Justice Concerns in the Design of California's Climate Policy* (with Robert N. Stavins), prepared for the Western States Petroleum Association and the AB 32 Implementation Group, November 2009.

*Next Steps for California with Federal Cap-and-Trade Policy On the Horizon* (with Robert N. Stavins and Jonathan Borck), prepared for the Western States Petroleum Association, July 2009.

*Evolving GHG Trading Systems Outside Its Borders: How Should California Respond?* (with Robert N. Stavins and Jonathan Borck), prepared for the Western States Petroleum Association, July 2009.

*Competitive Procurement of Retail Electricity Supply: Recent Trends in State Policies and Utility Practices*, (with Susan Tierney) prepared for the National Association of Regulatory Utility Commissioners in collaboration with the Federal Energy Regulatory Commission, July 2008.

*Uniform Pricing versus Pay-as-bid: Does it Make a Difference?*, (with Susan Tierney and Rana Mukerji) prepared for the New York Independent System Operator, March 2008.

*Prospects for the U.S. Nuclear Industry*, (co-author), prepared for a major Japanese electric power company, January 2001.

*Economic Evaluation of EPA's Proposed Rules for Cooling Water Intake Structures for New Facilities*, (with David Harrison) prepared for the Utility Water Act Group, November 2000.

*The Impacts of Revised Salem Refueling Schedules on the Wholesale and Retail Electric Market*, (with David Harrison and Gene Meehan) prepared for Public Service Enterprise Group as a filing to New Jersey Department of Environmental Protection, September 2000.

*Setting Baselines for Greenhouse Gas Credit Trading Programs: Lessons from Experience with Environmental and Non-Environmental Program*, (with David Harrison) Electric Power Research Institute Report #1000147, December 2000.

*Fueling Electricity Growth for a Growing Economy, Background Paper*, (with David Harrison) prepared for the Edison Electric Institute, July 2000.

*Energy-Environment Policy Integration and Coordination Study (E-EPIC) Phase 2 Executive Report* (Contributor), Electric Power Research Institute, Technical Report 1000097, December 2000.

*Economic Evaluation of Alternative Revised Refueling Outage Schedules for Salem Power Plant*, (with D. Harrison and J. Murphy), prepared for Public Service Electric and Gas Company as a filing to New Jersey Department of Environmental Protection, July 2000.

*Critical Review of "Economic Impacts of On Board Diagnostic Regulations,"* (with D. Harrison and S. Chamberlain) prepared for Alliance of Automobile Manufactures, January 2000.

*Costs and Benefits of Fish Protection Alternatives at the Salem Facility*, (with D. Harrison and J. Murphy) prepared for Public Service Electric and Gas Company as a filing to New Jersey Department of Environmental Protection, March 1999.

*Energy-Environment Policy Integration and Coordination Study (E-EPIC) Phase 1 Executive Report*, (Contributor) Electric Power Research Institute, February 1999.

*Economic Benefits of Barajas Airport to the Madrid Region and the Neighboring Communities*, (with D. Harrison, J. Garcia-Cobos, and D. Rowland) prepared on behalf of the Spanish Government, January 1999.

*Disposal Cost Fee Study*, (with Frank Ackerman, Gretchen McClain, Irene Peters, and John Schall) prepared for the California Integrated Waste Management Board, 1991.

*The Marginal Cost of Handling Packaging Materials in the New Jersey Solid Waste System*, (with John Schall) prepared for The Council of State Governments and the New Jersey Department of Environmental Protection, 1990.

*Energy Implications of Alternative Solid Waste Management Systems*, (with Monica Becker and Allen White), prepared for the Northeast Regional Biomass Program, Coalition of Northeastern Governors Policy Research Center, 1990.

### **TESTIMONY AND OTHER FILINGS**

Rebuttal Testimony on behalf of ITC Midwest LLC, Minnesota Public Utilities Commission, Docket No. CN-12-1053, April 25, 2014.

Direct Testimony on behalf of ITC Midwest LLC, Minnesota Public Utilities Commission, Docket No. CN-12-1053, February 24, 2014.

Testimony on behalf of the ISO New England, FERC Docket No. ER14-1050-001, February 12, 2014.

Affidavit on behalf of the ISO New England, Performance Incentives Market Rule Changes, FERC Docket No. ER14-1050-001, January 14, 2014.

Comments submitted to the California Air Resources Board Regarding on the Proposed Regulation to Implement the AB 32 Cap-and-Trade Program, August 2011 (with Robert N. Stavins).

Comments submitted to the Little Hoover Commission's Study of Regulatory Reform in California, January 2011 (with Robert N. Stavins).

Comments submitted to the California Air Resources Board Regarding on the Proposed Regulation to Implement the AB 32 Cap-and-Trade Program, December 2010.

Comments submitted to the California Air Resources Board Regarding Cost Containment Provisions of Preliminary Draft Cap-and-Trade Regulation, July 2010.

Comments submitted to the Economics and Allocation Advisory Committee, California Air Resources Board regarding draft report "Allocating Emissions Allowances Under California's Cap-and-Trade System," December 1, 2009 (with Robert N. Stavins).