

Dr. Andrew W. Thompson

ENERGY ASSOCIATE

Boston/Madrid

Mobile +34.66.663.91.97

Office +34.91.048.71.00

andrew.thompson@brattle.com

Dr. Thompson is an energy economist with a background in electrical engineering and expertise in wholesale electricity market design, regulatory economics, and policy analysis of network industries, particularly in the energy sector.

His work focuses on:

- Capacity market/auction design
- Wholesale electricity market design and reform
- Integration of emerging energy technologies
- Energy market regulation
- The hydrogen economy
- Energy finance and cost of capital estimation
- Economic damages assessments for renewable and battery storage assets

Dr. Thompson has supported clients and diverse stakeholder groups – including electricity system operators, energy regulators, governments, clean energy advocacy groups, market participants, institutional investors, and utilities – in several international jurisdictions. This includes PJM, CAISO, ERCOT, NYISO, ISO-NE, the Non-ISO/RTO United States, Ontario, Alberta, the United Kingdom, Spain, Colombia, Saudi Arabia, Australia, and New Zealand.

He has published thought leadership on the evolving hydrogen economy; the regulation of the energy sector; energy policy to integrate emerging resources (renewables, battery storage, long-duration energy storage, distributed energy resources, and flexible load); and the economic implications of lithium-ion battery degradation for energy storage and electric vehicle technologies.

AREAS OF EXPERTISE

- Electricity Wholesale Markets & Planning
- Regulatory Economics, Finance & Rates

EDUCATION

- **Université Paris-Saclay (Paris, France)**
PhD in Economics
- **Universidad Pontificia Comillas (Madrid, Spain)**
MS in Energy Economics
- **Delft University of Technology (Delft, The Netherlands)**
MSc in Engineering and Policy Analysis
- **Rowan University (New Jersey, USA)**
BSc in Electrical and Computer Engineering

PROFESSIONAL EXPERIENCE

- **The Brattle Group (2020–Present)**
Energy Associate
- **University of California Berkeley/Lawrence Berkeley National Laboratory (2017–2019)**
Visiting Researcher
- **US Department of Energy: ARPE-E (2018)**
Technology-to-Market Scholar
- **Institut Vedecom (2016–2018)**
Electric Vehicle and Battery Storage Researcher
- **Iberian Energy Market Operator (OMIE) (2014–2015)**
Energy Analyst

SELECTED CONSULTING EXPERIENCE

CAPACITY MARKET/AUCTION DESIGN

- **[PJM Review of Capacity Market Design and Demand Curve Parameters](#)**: For PJM, conducted periodic reviews of PJM’s Reliability Pricing Model. Analyzed market functioning for resource adequacy, including uncertainty and volatility of prices, net cost of new entry (CONE) parameters, impacts of administrative parameters and regulatory uncertainties, locational mechanisms, demand curve shape, incremental auction procedures, and other market mechanisms. Developed a probabilistic simulation model evaluating the price volatility and reliability implications of alternative demand curve shapes and recommended a revised demand curve shape. Assisted expert support to stakeholder proceedings and testimony submitted before the Federal Energy Regulatory Commission.

- **PJM Development of Gross Avoidable Cost Rates**: For PJM, developed Avoidable Cost Rates (ACRs) for existing resource types for use in the Minimum Offer Price Rule (MOPR) and in Market Seller Offer Cap (MSOC). Contributed to submitted testimonies before FERC.
- **IESO Capacity Auction Design**: Provided expert support to IESO staff in support of a new capacity auction design and enhancements. Delivered detailed reports describing options, tradeoffs, and lessons learned on every aspect of capacity auction design. Developed analysis and design proposals for the capacity market demand curve, capacity accreditation methodologies, and penalty mechanism design. Supported IESO stakeholder engagement efforts and presented analyses of design alternatives in public forums.
- **AESO Market Pathways Initiative**: For the Alberta Electric System Operator (AESO) and the Executive Working Group (EWG), provided support for various inquiries into energy market enhancements as part of the Market Pathways initiative that aims to inform the future evolution of Alberta’s electricity market design.
- **Capacity Market Overview Study**: For a major renewable investment company, presented an overview of US and international capacity markets and resource adequacy mechanisms.
- **Capacity Accreditation Approaches for Hybrid Resources**: For a major renewable investment company, presented an assessment of current approaches to capacity accreditation using Effective Load Carrying Capability (ELCC) methods for evaluating hybrid resources.

WHOLESALE ELECTRICITY MARKET DESIGN AND REFORM

- **South Carolina Wholesale Energy Market Reforms Study**: For the South Carolina State Legislature, conducted a comprehensive assessment of potential benefits and risks from competitive reforms to the state’s electricity sector and regulatory model. Examined potential reforms to join or integrate with a regional transmission organization, introduce competition into resource planning, and pursue partial or full retail choice.
- **US Bulk System Reliability for Tomorrow’s Grid**: For the Center for Applied Environmental Law and Policy (CAELP), co-authored a report submitted to the US EPA as public comments of the New Source Performance Standards for greenhouse gas emissions. The report outlines current and emerging reliability impacts on the bulk power system due to recent and projected changes in the energy sector and explains the suite of solutions grid operators have at their disposal to ensure reliability is maintained throughout the ongoing energy transition.
- **Costs of Decarbonizing the US Electricity Sector**: For the American Council on Renewable Energy (ACORE), a renewable energy advocacy group, evaluated costs to decarbonize the US electricity sector under alternative proposals to extend and expand renewable energy tax credits in 2021. Simulated investment, costs, prices, and emissions nationally to 2050 using gridSIM, Brattle’s capacity expansion model. Informed client’s policy position.
- **IESO Wholesale Market Participation Model Design for DERs**: Provided expert support to IESO staff for proposed changes to wholesale market participation models and rules to better enable DER and hybrid resource integration.

INTEGRATION OF EMERGING ENERGY TECHNOLOGIES

- **IESO Long-term Contract Design for Renewable, Storage, and Hybrid Resources:** Provided expert support to IESO staff for long/mid-term RFP contract design to procure energy, capacity, and environmental attributes from emerging resources.
- **NEOM Saudi Arabia Load Flexibility Integration Study:** Developed supporting analysis and a load flexibility roadmap to assist the public utility (ENOWA) in developing their load flexibility integration plan for various sources of large-scale electricity demand within NEOM.

ENERGY MARKET REGULATION

- **Recent Developments in International Rate of Return Methods:** For Energy Networks Australia (ENA), developed an updated overview of international rate of return methods for regulators in the US, Great Britain, New Zealand, Italy, and The Netherlands. This paper also provided a review of the Australian Energy Regulator's draft 2022 Rate of Return Instrument and recommend improvements as well as a comparison on a like-for-like basis of recent rate of return decision from each regulator.
- **International Approaches to Regulated Rates of Return:** For the Australian Energy Regulator (AER), researched international approaches to rate of return and WACC estimations across six countries: Australia, Italy, the Netherlands, New Zealand, the US, and the UK. This report reviewed and summarized international regulators' approaches to utility regulation and compared the rate of return approach of each regulator to that of the AER as part of the 2022 Rate of Return Instrument.

THE HYDROGEN ECONOMY

- **Future of Hydrogen in the Power Sector:** For the Environmental Defense Fund (EDF), developed an assessment of the potential role of hydrogen in a decarbonized power sector. Explained the nature of reliability needs in renewable power systems and assessed hydrogen technologies' ability to address system reliability, resiliency, and resource adequacy challenges.

ENERGY FINANCE AND COST OF CAPITAL ESTIMATION

- **Alberta Utilities Commission Generic Cost of Capital (GCOC) Estimation:** Supported Dr. Bente Villadsen's expert testimony on the cost of equity and appropriate capital structure presented before the Alberta Utilities Commission (AUC).
- **Cost of Capital Estimation for North American regulated gas utility:** For a major North American regulated gas utility, performed economic research and analyses to support expert testimony estimating allowed Return on Equity to inform an upcoming rate case hearing.
- **Cost of Capital Estimation for North American regulated electric utility:** For a major North American regulated gas utility, performed economic research and analyses to support expert testimony estimating allowed Return on Equity to inform an upcoming rate case hearing.

ENERGY ASSET EVALUATION AND ECONOMIC DAMAGES ASSESSMENTS

- **PJM Battery Storage Asset Valuation and Damages:** For a major renewable energy developer, provided litigation support and developed economic damages estimation due to an alleged breach in contractual performance warranties of a battery storage asset in PJM Interconnection LLC.
- **Report on Spanish Wind Asset Regulatory Impacts:** For a major renewable energy developer, contributed to expert report on the financial impact on wind assets of a mid-stream switch in the regulatory regime for Spanish renewables.
- **Spanish Solar PV Asset Valuation and Damages:** For a major renewable energy developer, contributed to litigation support and damages estimation of an international arbitration concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The damages estimate considers the valuation of both the reduction in remuneration and financial instruments related to the project financing.
- **Spanish Wind Asset Valuation and Damages:** For a major renewable energy developer, contributed to litigation support and damages estimation of an international arbitration concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The damages estimate considers the valuation of both the reduction in remuneration and financial instruments related to the project financing.
- **Spanish Concentrated Solar Power (CSP) Asset Valuation and Damages:** For a major renewable energy developer, contributed to litigation support and damages estimation of an international arbitration concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The damages estimate considers the valuation of both the reduction in remuneration and financial instruments related to the project financing.
- **Colombia Energy Investors Dispute:** For a group of investors in electricity companies, contributed to analysis for expert testimony regarding a dispute over dividend payments before the Bogotá Chamber of Commerce Arbitration Centre.

ARTICLES & PUBLICATIONS

- “Assessment of Potential Market Reforms for South Carolina’s Electricity Sector,” with John H. Tsoukalis, Kathleen Spees, Johannes P. Pfeifenberger, Andrew Levitt, and Oleksandr Kuzura, prepared for the South Carolina General Assembly Electricity Market Reform Measures Committee (April 2023)
- “Gross Avoidable Costs for Existing Generation,” with Samuel Newell, prepared for PJM Interconnection, L.L.C. (January 2023)
- “International Rate of Return Methods – Recent Developments,” with Bente Villadsen and Toby Brown, prepared for Energy Networks Australia (September 2022)
- “Fifth Review of PJM’s Variable Resource Requirement Curve,” with Kathleen Spees and Samuel Newell, prepared for PJM Interconnection (April 2022)

- “Vehicle-to-Everything (V2X) Energy Services, Values Streams, and Regulatory Policy Implications,” with Yannick Perez, *Energy Policy*, 137, Article 111136 (2020)
 - “Economic implications of lithium-ion battery degradation for Vehicle-to-Grid (V2X) services,” *The Journal of Power Sources*, 396, pp. 691–709 (2018)
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PRESENTATIONS & SPEAKING ENGAGEMENTS

- “Resource Adequacy Trends of the Energy Transition: Experience from North America,” NTNU Energy Transition Week: Power Markets (March 2024)
 - “Role of Hydrogen in a Decarbonized Future,” with Josh Figueroa and Metin Celebi, Bank of America Global Research US Alternative Energy Hydrogen Conference (December 2023)
 - “Discussion on Demand Curve Review,” IESO Technical Session (October 2022)
 - “Market Implementation Committee Special Session: Quadrennial Review,” with Kathleen Spees and Samuel Newell, PJM Interconnection (December 2021)
 - “Economic Feasibility of Wind Energy Participation in Secondary Reserves Markets,” *Proceedings of the 1st Italian Association of Energy Economists (IAEE) Energy Symposium*, Milan, Italy (2016)
 - “PV by-pass diode performance in landscape and portrait modalities,” with Carlos Barreiro, Peter M. Jansson, and John L. Schmalzel, *37th IEEE Photovoltaic Specialists Conference* (2011)
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PROFESSIONAL ASSOCIATIONS & MEMBERSHIPS

2015–Present International Association for Energy Economics (IAEE)

LANGUAGES

- Spanish (fluent)
- French (conversational)