Joe Hooker

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC. San Francisco, CA
Director

Mr. Hooker joined E3 in 2018. He has provided support to utilities, project developers, transmission developers, large customers, and automakers in assessing the challenges and opportunities in transitioning to a decarbonized electricity system. He has helped clients navigate complex electricity industry dynamics and achieve goals related to reliability, affordability, decarbonization, and value creation. His areas of expertise include resource planning and asset valuation. He has provided resource planning support to Arizona Public Service, the State of South Carolina, NV Energy, Nova Scotia Power, and El Paso Electric. He has provided asset valuation support to several confidential clients.

Prior to joining E3, Mr. Hooker worked for four years at another energy consulting firm. There, he helped build a new "Utility of the Future" practice that helped transmission and distribution utilities develop new strategies for distribution planning, rate design, integration of distributed energy resources, and product and service offerings. Mr. Hooker earned an M.S. in Energy Engineering from Ecole Polytechnique and a B.S. in Industrial Engineering from Northwestern University.

Select E3 projects include:

- **Analytical Support for Integrated Resource Plan, El Paso Electric, 2020.** Leading a team to perform several analyses for El Paso Electric's 2021 Integrated Resource Plan. Determining the required planning reserve margin (PRM) for maintaining an adequate level of reliability. Calculating the effective load carrying capability (ELCC) for renewable and energy storage resources to ensure appropriate capacity accreditation towards the PRM. Performing long-term capacity expansion modeling to meet New Mexico's requirement for 100 percent zero-carbon energy by 2045, considering the capabilities of both supply-side and demand-side resources. Conducting detailed production cost modeling to investigate the costs and requirements of operating a high-renewable system.
- **Integrated Resource Plan Support – Zero Carbon Analysis, NV Energy, 2020.** Led a team to quantify the value of diverse renewable resources in helping NV Energy meet the state of Nevada's goal of 100 percent zero-carbon energy by 2050, for use in NV Energy's Fourth Amendment to the 2018 Joint IRP. Coordinated and contributed to an E3 report and E3-sponsored testimony that NV Energy included in its application. Provided responses to data requests throughout the proceeding.
- **Integrated Resource Plan Support – ELCC Analysis, NV Energy, 2020.** Led a team to calculate the effective load carrying capability (ELCC) of renewable and energy storage resources at various penetration levels, for use in NV Energy's Fourth Amendment to the 2018 Joint IRP. Coordinated and contributed to an E3 report and E3-sponsored testimony that NV Energy included in its application. Provided responses to data requests throughout the proceeding.
- **Wyoming Wind and Transmission Benefit-Cost Analysis, Confidential Transmission Developers, 2020.** Supported a group of transmission developers assess several transmission projects that

would increase the capability of delivering wind from Wyoming to major load centers in the West, including to California and the Desert Southwest. Coordinated with developers to characterize the costs and capabilities of the transmission lines across several scenarios. Led a team to perform capacity expansion and production cost modeling to identify the savings of adding Wyoming wind to resource portfolios in California and the Desert Southwest. Delivered a report summarizing the cost-effectiveness of the transmission projects across all scenarios.

- **Support in Evaluating the Sale of Santee Cooper, South Carolina Department of Administration, 2019-20.** Advised the State of South Carolina on three options: sale of all or a portion of Santee Cooper's assets; management of Santee Cooper by a third party; and a restructuring plan proposed by Santee Cooper itself. Led a team to develop a model that assesses the cost of long-term resource plans proposed for Santee Cooper. Using this model, evaluated the cost-competitiveness and risks of resource plans, which factored into the rate projections and recommendations included in the report to the State of South Carolina.
- **Market Assessment for the Desert Southwest, Confidential Solar Developer, 2019.** For a concentrated solar power (CSP) developer, assessed the economics of deploying their technology in the Desert Southwest. Led a team to forecast the annual revenue of a 100 MW project and determine the after-tax equity return, taking into account the investment tax credit, financing costs, and all costs to develop, build, and operate the project. Performed capacity expansion modeling in California to estimate the market size for the technology over time.
- **Integrated Resource Plan Support – Stakeholder Engagement Support, Arizona Public Service, 2018-19.** Designed, implemented, and ran a custom-built resource planning model to evaluate resource portfolios to meet prospective state-level clean energy targets at the lowest overall cost across a wide range of scenarios. Translated findings into digestible information so stakeholders could clearly understand carbon benefits, incremental costs, and trade-offs between different policy and resource options.
- **Economic Evaluation of Electric Vehicles as a Grid Resource, Confidential OEM Automaker, 2018-19.** Advised an automaker on opportunities and business models to increase revenues from electric vehicles (EVs) in parallel with growing interactions between the electricity and transportation sectors. Quantified the revenue potential and market size for grid services from EVs and energy storage. Outlines how the client could sell flexibility services to utilities and/or wholesale energy markets.
- **Economic Analysis of Strategic Options for Achieving a Highly Renewable Electricity Supply, Confidential Large Energy User, 2018-19.** For the largest utility customer on a small island, analyzed the costs associated with shifting the island's electricity mix from mostly diesel to 90-100 percent renewable and advised the client on strategic options to achieve that goal, including purchasing the utility's assets outright.

ÉLECTRICITÉ DE FRANCE (EDF) Paris, France

Energy Researcher April 2018 – August 2018

- Developed a model to determine the economic implications of moving to an electricity system in France with a very high penetration of renewable generation (from 10% up to 100%)
- Optimized renewable energy, energy storage, thermal power plant, and transmission investment decisions, as well as real-time grid operations, to obtain a desired penetration of renewable energy at least cost in 2030

- Performed separate optimizations for France's twelve mainland regions, as well as the country as a whole, to determine how locally-optimized investment decisions could influence the cost and energy mix of a national system with high levels of renewable energy

THE NORTHBRIDGE GROUP Concord, MA
Energy Consultant September 2013 – June 2017

- Consulted for 13 different clients in the U.S. electricity industry, including utilities, power producers, a non-profit, and battery developers
- Supported partners at NorthBridge by performing research, synthesizing information, conducting rigorous quantitative modeling, and communicating insights to clients
- Helped build a new "Utility of the Future" practice that helps transmission and distribution utilities develop new strategies and approaches for rate design, distribution planning, product and service offerings, and integration of distributed energy resources
- Modeled the optimal operations of 52 utility-scale battery projects, totaling 334 megawatts. Maximized revenues across energy, capacity, and ancillary services markets while still allowing operations of the battery to defer a "traditional" distribution grid investment
- Built a model to value the components of a microgrid, including a solar project, a battery storage system, a fuel cell, and a gas microturbine
- Presented in-person to two utility executive boards on utility-scale batteries and challenges to the current utility business model. Together, these utilities serve more than 5 million customers
- For several utilities across the U.S., catalogued national developments regarding departures from net metering and provided guidance on how to appropriately value and compensate distributed solar
- For a potential entrant to California's Energy Imbalance Market (EIM), assessed the prevalence of negatively-priced hours and quantified the benefits of joining the EIM and shifting load to these hours
- For a foreign battery manufacturer, developed an overview of the energy storage market in the U.S. and provided an outlook for batteries participating and earning revenues in the PJM frequency regulation market

Education

École Polytechnique Palaiseau, France
M.S., Energy Engineering 2017 – 2018

Northwestern University Evanston, IL
B.S., Industrial Engineering 2009 – 2013
Minor in Economics
Kellogg School of Management Undergraduate Certificate in Managerial Analytics