Aryeh (Ari) Gold-Parker, Ph.D.

44 Montgomery Street, Suite 1500, San Francisco, CA 94104
aryeh.goldparker@ethree.com

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

Since joining E3 in 2018, Dr. Gold-Parker has supported E3's Climate Pathways and Distributed Energy Resources (DER) practice areas, where he works with policymakers, regulators, utilities, and businesses to understand how our electricity and natural gas systems will transform under deep decarbonization. His work focuses on building and vehicle electrification, utility cost recovery, and energy affordability. He has also enhanced E3's modeling capabilities by developing new tools for understanding the impacts of building electrification on peak electric loads and on natural gas revenue requirements and rates.

Dr. Gold-Parker enjoys managing and contributing to complex projects and appreciates the challenges of communicating technical concepts in an accessible manner. In addition to his project management and technical modeling work, he has helped prepare expert witness testimony for regulatory commissions in California, Georgia, Minnesota, and Alberta. Dr. Gold-Parker's doctoral research, which was published in *Nature Communications* and the *Proceedings of the National Academy of Sciences*, explored next-generation materials for solar cells. He holds a PhD in chemistry from Stanford University and a BA in chemistry and physics from Harvard University.

Notable E3 projects include:

- **California Public Utility Commission, Income-Graduated Fixed Charge Model (2022-ongoing).** Leading an E3 team supporting the California Public Utilities Commission (CPUC) in an active proceeding that may lead to the most significant changes to California's default residential electric rates in recent history. Led a stakeholder workshop on the public Microsoft Excel-based fixed charge design model that E3 developed to assist stakeholders in developing income-graduated fixed charge proposals and to facilitate comparison among party proposals. This model is based on up-to-date utility cost-of-service studies, ensuring that new rate designs developed by stakeholders using the tool are revenue-neutral.
- **California Energy Commission, Role of Hydrogen in California's Electric Sector (2024-present).** Leading an EPIC-funded research project to investigate the role of hydrogen in a decarbonized electric system in California. Leading a team with three subcontractors: an NREL research team, a Stanford research team, and an environmental impacts assessment contractor. This project is utilizing an updated version of the RESOLVE capacity expansion model that, in addition to modeling electricity, can also directly model hydrogen production, transportation, storage, and consumption.
- **California Public Utilities Commission, Integrated Resource Planning Process (2020-present).** Managing an E3 team working on developing revenue requirement forecasts for cost categories that are not directly modeled in capacity expansion, including distribution, transmission, program costs, wildfire-related costs, and others. Leading the development of metrics and materials related to energy costs and affordability. Supported these workstreams since 2020.

- **California Public Utilities Commission, Net Energy Metering Revisit Rulemaking Technical Support (2020-2022).** Led an E3 team supporting the California Public Utilities Commission in the development of the Net Billing Tariff, the successor to the Net Energy Metering 2.0 (NEM) tariff. Led a stakeholder workshop on E3's public model, answering questions from stakeholders about the model and E3's analytical approach. The public model was used to evaluate party proposals for successor tariffs and calculate the impact of these tariff designs on participants and nonparticipants, as well as to model the Commission-proposed tariffs to support both the Commission's December 2021 proposed decision and the November 2022 proposed decision. The 2022 proposed decision was adopted by the Commission as D.22-12-056.
- **California Energy Commission, Strategic Pathways and Analytics for Tactical Gas System Decommissioning (2021-2024).** Leading a team with E3, Gridworks, East Bay Community Energy (EBCE), and project partner PG&E to evaluate opportunities for strategic decommissioning of gas system assets in EBCE and PG&E's service territory. Prior work has hypothesized that the combination of geographically targeted building electrification and gas system decommissioning could be an important tool to reduce gas system costs as building decarbonization progresses. This work will design a site selection framework for strategic gas decommissioning projects, will engage with communities to better understand customer priorities regarding building electrification and gas system decommissioning, and will develop implementation plans for three gas decommissioning pilot projects.
- **Massachusetts Local Gas Distribution Companies (Gas LDCs), The Role of Gas Distribution Companies in Achieving the Commonwealth's Climate Goals (2021-2022).** E3 is supporting the Massachusetts Gas LDCs in the Massachusetts Department of Public Utilities' Docket 20-80, which seeks to "examine the role of Massachusetts gas [LDCs] in helping the Commonwealth to achieve its 2050 climate goals." With extensive stakeholder feedback, E3 developed eight Pathways that achieve building decarbonization through building electrification, decarbonized gas, and/or networked geothermal systems. Dr. Gold-Parker led the development of a gas revenue requirement model that a) estimates the impacts of these pathways on gas LDC revenue requirements and customer bills, and b) enables exploration of novel regulatory approaches to address the customer cost impacts that may arise.
- **California Public Utilities Commission, En Banc on Energy Rates and Costs (2021).** Led E3 modeling of energy rates and costs that was featured in a May 2021 report on Utility Costs and Affordability and then presented at a CPUC En Banc meeting on Energy Rates and Costs in the same month. E3 developed the Residential Energy Cost Calculator (RECC) to complement existing tools used in California's integrated resource planning (IRP) process. The RECC provides a 10-year forecast of energy bills for representative households in California and enables comparison among different customers under a given electric system portfolio, illustrating how variations in rate option, climate zone, building type, electrification status, and other factors may affect residential energy bills. The RECC also enables comparison among different electric sector portfolios developed in IRP, revealing how a change in planning targets or modeling assumptions would affect bills for a given household.
- **Philadelphia Gas Works, Business Diversification Model (2020-2021).** In a project for the City of Philadelphia, E3 considered technology pathways and business diversification options for the municipal gas utility Philadelphia Gas Works (PGW) that are consistent with the city's decarbonization goals. Dr. Gold-Parker developed a revenue requirement model to evaluate impacts on PGW's business model and its customers, also considering revenues from hypothetical future lines of business including heat pump installation and selling heat as a service.

- **New Ulm Public Utilities, Coal Contract Extension Evaluation (2020).** Supported the municipal utility in New Ulm, Minnesota in evaluating a proposed contract extension agreement with a coal generator. E3 performed economic and policy risk analysis, leading to a recommendation against the contact extension. Testified at a New Ulm Board Meeting regarding our findings and recommendations. New Ulm ultimately declined the coal contract extension.
- **Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future (2020).** Modeled the impacts of building electrification on peak electric loads under deep decarbonization scenarios in New England. Updated E3's RESHAPE model to consider a mix of technology options including different kinds of heat pump systems with fuel vs. electric resistance backup.
- **Georgia Large-Scale Solar Association, Georgia Power Avoided Cost Testimony (2020).** Prepared expert witness testimony describing concerns with Georgia Power's avoided cost approach, which is used to evaluate large-scale solar generation in their integrated resource planning process. The E3 team identified issues with the treatment of capacity costs, reserve costs, and the solar resource profile used (fixed-tilt vs. tracking). The testimony also described how advanced US utilities model solar and storage resources in resource planning using modern portfolio optimization software.
- **FortisAlberta, Distribution System Inquiry (2020).** Prepared expert witness testimony describing how today's policies and rate structures in Alberta will lead to inefficient DER procurement and dispatch as well as cost shifts. Developed a roadmap for the evolution of Alberta's distribution system, recognizing that the timing of DER adoption will depend on factors including the cost of DERs, power prices, consumer preferences, and government policy.
- **South Carolina Dept. of Administration, Bid Evaluation for Potential Sale of Santee Cooper (2019-2020).** E3 was selected by the South Carolina Dept. of Administration to advise the state on the potential sale of Santee Cooper, one of the largest municipal electric utilities in the US. As part of due diligence of Santee Cooper's rate setting methodology and proposed resource plan, Dr. Gold-Parker developed a dynamic dispatch model for Santee Cooper's electric system, which fed into an economic revenue requirement and rate forecasting model for Santee Cooper's utility business.
- **California Energy Commission, The Challenge of Retail Gas in California's Low-Carbon Future (2018-2019).** Modeled natural gas utility revenue requirements in scenarios consistent with California's greenhouse gas reduction targets. Developed a model that illustrates how, as building electrification becomes more widespread, declines in gas throughput will impact rates and bills for a shrinking gas customer base. Identified gas system transition strategies that can help to mitigate customer bill impacts.
- **Development of E3's RESHAPE model (2018-19).** Supported the initial development of E3's RESHAPE model, which simulates system-level load shapes for building electrification. RESHAPE combines data on buildings, historical weather, and a model of heat pump operation to forecast heating demands and simulate hourly electric loads from space and water heating. RESHAPE has been used by a variety of private- and public-sector clients across the United States and Canada to better understand the electric load impacts of widespread building electrification.

Education

Stanford University Palo Alto, CA

Ph.D., Chemistry 2018
National Science Foundation Graduate Research Fellowship 2014
National Defense Science and Engineering Graduate Fellowship 2014

Harvard University Cambridge, MA
B.A., Chemistry and Physics 2012

Selected Publications

1. Energy and Environmental Economics, *"Benefit-Cost Analysis of Targeted Electrification and Gas Decommissioning in California."* For the California Energy Commission (2023). https://www.ethree.com/wp-content/uploads/2023/12/E3_Benefit-Cost-Analysis-of-Targeted-Electrification-and-Gas-Decommissioning-in-California.pdf
2. Energy and Environmental Economics, *"Rate Design for the Energy Transition: Getting the Most Out of Flexible Loads on a Changing Grid."* For the Energy Systems Integration Group (2023). https://www.ethree.com/wp-content/uploads/2023/04/ESIG-Retail-Pricing-dynamic-rates-E3-wp-2023.pdf
3. Energy and Environmental Economics and Energy Futures Initiative, *"Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future"* (2020). *https://www.ethree.com/wp-content/uploads/2020/11/E3-EFI_Report-New-England-Reliability-Under-Deep-Decarbonization_Full-Report_November_2020.pdf*
4. Energy and Environmental Economics, *"Literature Review of Economy-Wide Deep Decarbonization and Highly Renewable Energy Systems."* For the New York State Energy Research and Development Authority (2020). https://climate.ny.gov/-/media/CLCPA/Files/2020-06-24-NYS-Decarbonization-Pathways-App-B.pdf