

ENERGY AND ENVIRONMENTAL ECONOMICS, INC.
Managing Consultant

San Francisco, CA

Mr. Garnett joined E3 in 2017 after completing his Master of Economics and Policy of Energy and the Environment at University College London (UCL). He is a member of E3's Distributed Energy Resources (DER) group and focuses on Electric Vehicles (EVs), microgrids, demand response, and behind the meter energy storage. His work has helped clients in load forecasting under high electrification scenarios, cost-benefit analysis, utility program evaluation, rate design, and DER participation in wholesale markets. Mr. Garnett brings with him experience from across the energy industry, from demand response aggregation in the UK, to data acquisition and analytics for a multinational oil field services company, to project management for a biomass start-up in East Africa. He also has extensive modelling experience in Python, R, and MATLAB. Select E3 projects include:

- **Virtual Power Plants in Resource Planning, Sacramento Municipal Utility District, 2021 – present.** Evaluated the role a portfolio of DERs in SMUDs 2030 resource plan. Added new optimization functionality to E3's RESOLVE resource planning tool to accurately reflect the behavioral diversity of DER technologies. Constructed a DER supply curve and developed behavioral datasets in collaboration with Lawrence Berkley National lab and through modelling EV charging in E3's EVGrid model.
- **Vehicle Grid Integration Market Opportunity Analysis, Four multinational Automakers, 2020 – 2021.** Performed a regulatory barrier analysis of vehicle-grid-integration technologies accessing various revenue streams across the US focused on residential EV owners. Calculated revenue potential under V1G and V2G scenarios from different value streams such as wholesale market participation, demand response, and retail rate savings. Supported the client in developing a business plan for a joint venture based on the project analysis.
- **DER Aggregation Tariff Design, Arizona Public Service, 2021 – present.** Supported the development of a unique new program that awards aggregators and customers for various value streams through a single tariff. Surveyed existing programs across the US, presented analysis at stakeholder meetings, provided tariff design input, and evaluated different tariff proposals in E3s RESTORE DER dispatch optimization tool.
- **Microgrid Tariff Analysis, Pacific Gas and Electric, 2019 – 2020.** Evaluated a range of microgrid designs and tariff configurations to understand the implications of the California Public Utilities Commission (CPUC) order instituting rulemaking in response to SB 1339. Developed E3's RESTORE model to model different microgrid designs which meet resiliency targets. Measured the bill impacts, cost-shift, value of lost load, and other metrics to evaluate the performance of the microgrids using avoided cost and market price frameworks.
- **Rate Design to promote Vehicle-Grid-Integration, Multinational Automaker, 2019 – 2021** Led the analysis and wrote a white paper on rate design to promote smart charging in California. The study largely focused on novel tariff designs aimed at automakers or EV aggregators and included dynamic 3-part rates with conjunctive demand charges to minimize sub-feeder load impacts.

- **Evaluation of Frequency Regulation EV Pilot Program, Nuvve and the California Energy Commission, 2018 – 2019.** Led an evaluation of a pilot project for an EV aggregation participating in frequency regulation markets in the California ISO. Performed an in-depth investigation of frequency regulation market rules to calculate resource performance, penalties, and revenues for the EV coalition. Conducted an optimal dispatch study to understand the upper performance limits for the aggregation.
- **Evaluation of California’s Self-Generation Incentive Program (SGIP) for Advanced Energy Storage Systems, California Public Utilities Commission, 2017 – 2019.** Led the 2018 impact evaluation for SGIP which included over 600 commercial and residential behind-the-meter energy storage projects. Conducted optimal dispatch simulation using E3’s RESTORE tool to evaluate the emission, grid, and ratepayer impacts of the California SGIP including modelling changes to the program to include a day-ahead grid carbon intensity signal.
- **Vehicle-Grid-Integration market assessment, Japanese Technology Company, 2019.** Supported a market sizing analysis for different vehicle-grid-integration (VGI) technologies in California. Calculated the grid value of VGI using results from E3’s integrated resource planning tool RESOLVE and driving behavioral data. Led a follow-up assessment to size the market for Proxy-Demand Response in the California ISO for workplace EV aggregations.
- **Value of Vehicle-to-Grid (V2G) in California, EPRI, 2018.** Developed new features in the RESTORE dispatch optimization tool to co-optimize a workplace EV fleet and analyze the grid benefits of distribution-aware vehicle-to-grid (V2G). Discovered that V2G capability provided significant additional value compared to smart charging.
- **EV Program Ratepayer Impact Study, SDG&E, 2020.** Led a study into the ratepayer impacts of an EV program which SDG&E plans to file in late 2020. The team generated scenarios to evaluate the impact the program may have on EV adoption, scenarios for different managed charging technologies, and scenarios for different avoided cost trajectories. SDG&E extended the engagement for E3 to publish a public whitepaper on the study.
- **Transportation Electrification Cost-Benefit Studies, Xcel Energy, 2020.** Led a cost-benefit study to support Xcel Energy’s filing of their transportation electrification plan for their Colorado and New Mexico service territories. The study included analysis of personal Light-Duty Vehicles, rideshare, transit busses, and school busses as well as sensitivities around managed charging, public DCFC infrastructure, and make-ready programs. Xcel engaged E3 in follow-up work to extend the cost-benefit study to Xcel’s other service territories to evaluate a corporate EV goal of reaching 1.5 Million EVs by 2030.
- **Strategic support for DCFC program development, Hydro Quebec, 2017 – 2019.** Performed a benchmarking study and economic analysis to gain regulatory and legislative approval for Hydro Québec to install, own, and operate over 1,500 DCFCs across the province. Supported the expert witness during the regulatory proceeding and was questioned directly by interveners.
- **Tata Power Dehli Distribution Limited (TPDDL), 2018 – 2020.** Performed cost-benefit analysis to identify an optimal set of DER solutions, with a focus on EVs, and customizing E3’s Integrated Demand Side Management (iDSM) tool for TPDDL’s system on a project funded by the U.S. Trade and Development Agency (USTDA).

KIWI POWER

Demand Response Analyst

London, UK

April 2017 – September 2017

KiWi Power is the UK's leading demand response aggregator. Whilst studying at UCL, worked part time within the operations team monitoring sites across the UK that participate in demand response programs

offered by the National Grid such as the Short-Term Operating Reserve (STOR), Capacity Market, and Frequency Response programs.

- Monitored the entire UK portfolio – around 150 MW of capacity installed in over 50 sites across the UK – and provided operational support to the French team.
- Liaised directly with clients and the National Grid to ensure sufficient load reduction during demand response events.
- Worked with the technology team to aid the transition to a new software platform.

INYENYERI

Project Manager

Kigali, Rwanda

July 2016 – September 2016

Interned at a clean cookstove and biomass startup with a novel utility-style business model that offers an affordable, clean, and modern cooking experience to low-income consumers in Rwanda.

- Managed a \$10M grant application for which Inyenyeri was the lead applicant with 12 partner organizations.
- Created a discounted cash-flow model to forecast our customer base expansion under different joint-venture and franchising scenarios.

BAKER HUGHES INC.

Field Engineer

Aberdeen, UK

September 2013 – July 2016

Joined the graduate program within the drilling services product line, specializing in the acquisition, processing, and analysis of surface and logging data during drilling operations. Rotated through different office and rig-site roles.

- Extensive offshore experience in surface and sub-surface data acquisition and analysis with eight operators; won award for exceptional service.
- Selected for a competitive pricing analysis project; used data from 11 wells to optimize pricing for new performance-based contracts, creating a tool used by the UK product line's largest client.
- Selected to work as an onshore operations coordinator for a new client, completing four wells. Responsible for operations planning, field engineer management, equipment procurement, and logistics.
- Re-structured the deliverables quality control department, cutting operating costs by 23% and significantly improving departmental performance indicators.

RIVERSTONE HOLDINGS LLC

Analyst

London, UK

Summer 2011

Private equity firm targeting the renewables, and oil and gas sectors.

- Identified and evaluated potential opportunities in the European gas storage market, a biofuels project in Ukraine, and oil and gas shipping companies in Asia.

Education

University College London
MSc Economics and Policy of Energy and the Environment

London, UK
2017

Imperial College London
MSci Chemistry
Awarded Best Final Research Presentation

London, UK
2013
2013

Publications

Garnett, O., Jiang, H., “Markov-Chain Monte Carlo technique for measuring EV participation in the CAISO proxy demand response market”, *EVS33 Conference Paper*, 2020

Wood, S., Garnett, O., Tokmoldin, N., Tsoi, W.C., Haque, S.A. and Kim, J.-S., “In situ formation of organic-inorganic hybrid nanostructures for photovoltaic applications,” *Faraday Discussions*, 174, 2014.

Citizenship

United Kingdom
United States