Caitlin McMahon

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC. Boston, MA
Senior Consultant

Caitlin McMahon supports E3's work in distributed energy resources analysis with an emphasis on geospatial electrification forecasting and electric vehicle load management. She provides technical leadership for the Forecasting Anywhere model, managing E3's deployment of the tool for geospatial electrification adoption and grid impact analyses. Ms. McMahon has also supported E3 analysis on electric vehicles, standalone storage, hybrid solar-storage systems, building electrification, and grid modernization. Prior to E3, Ms. McMahon completed research at Stanford while earning a master's degree in Energy Resources Engineering. Her research focused on enhancing demand response in commercial buildings. She previously interned in the Grid Modernization group at National Grid where she estimated available hosting capacity for distributed generation and performed protection engineering studies. In addition to her M.S., Ms. McMahon holds a B.S. in Electrical Engineering from Union College.

Select E3 projects include:

PG&E Electrification Impact Study (2024-2025). Managing E3's support for PG&E's scenario-based assessment of DER adoption and load growth out to 2040, mandated by the CPUC. Provided technical leadership and methodology development for E3's application of Forecasting Anywhere to model the technical potential and propensities for DER adoption and resulting grid infrastructure costs. The study includes the creation of transportation electrification and building electrification load shapes, analyzing equity-focused adoption, and examining the potential of flexible loads to reduce grid costs.

Long Island Power Authority Fleet Vehicle Electrification Study (2024-2025). Provided technical leadership for this project that leveraged Forecasting Anywhere to provide a geospatial allocation of fleet charger adoption and modeling for load impact on the distribution system. E3 worked with PSEG-LI to incorporate circuit data including their unique base load shapes to help prioritize circuits for upgrading in the near- and long-term. Studied managed charging, comparing the rate design impacts of different charging scenarios.

Washington DC Public Service Commission, Cost Benefit Analysis Model (2024-2025). Supported E3's development of a modeling framework and an avoided costs framework for a model that will quantify the costs and benefits of a given program across more than 30 unique elements, including impacts to the electric system, the gas system, water usage, and consumption of delivered fuels.

New York Value of Distributed Energy Resources Proceeding Support (2024). Contributed model development and input development for an update to E3's New York VDER model. Applied the updated model to create a missing money analysis to evaluate storage and hybrid solar+storage solutions in New York. Compared retail rate incentives with E3's recommendations from the completed missing money analysis.

New York City, PowerUp NYC Long-Term Energy Plan (2023). Supported E3's grid readiness workstream, using the Forecasting Anywhere model to complete geospatial analysis and load forecasting. Identified areas that will shift to winter peaking regions as well as areas where future upgrades from Con Edison, the local utility, can align with potential future stresses to the grid. This was one of eight workstreams that E3 led as part of a broader project to develop New York City's first long-term energy plan.

Exelon, Decarbonization Studies (2023). Used Forecasting Anywhere to complete geospatial analysis and load forecasting. Led input preprocessing, converted outputs from E3's PATHWAYS model into inputs for Forecasting Anywhere and led quality assurance and quality control on that process. Tested the model and integrated new pieces of code to make sure the model runs seamlessly. Modeling results were used to examine where heat pump and EV charger adoption will occur in six different Exelon service territories.

Confidential Client, V2X Study (2023). Studied various use cases for V2X including vehicle-to-grid, vehicle-to-home, vehicle-to-business, and vehicle-to-microgrid. Supported data inputs, feature testing, QA/QC, and messaging for E3's RESTORE model as E3 developed a new, specific application of the model to examine V2X for a confidential automaker.

STANFORD UNIVERSITY Stanford, CA
Researcher, Cooler Project, Sally Benson September 2020 – June 2022

- Created data analytic tools and statistical models processing one billion data points from 1,000 integrated pieces of campus HVAC equipment, uncovering hidden inefficiencies in the buildings and maximizing system flexibility for demand response
- Led experimentation demonstrating load reductions of 5-29 percent on campus

NATIONAL GRID Albany, NY
Grid Modernization Intern June 2019 – December 2020

- Utilized PI Datalink and excel to extract feeder performance data and create load profiles
- Identified spot loads by analyzing transformer actual versus rated current and voltage

NEW YORK POWER AUTHORITY Massena, NY
Developmental Intern June 2017 – August 2018

- Managed electrical engineering and controls projects through design, procurement, scheduling, print management, regulatory review, field implementation oversight

Education

Stanford University Stanford, CA
M.S., Energy Resources Engineering June 2022

Union College Schenectady, NY
B.S., Electrical Engineering June 2020