

Yueying (Jasmine) Ouyang

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC.
Senior Managing Consultant

San Francisco, CA

Ms. Ouyang's work focuses on enabling distribution energy resources, especially solar PV, storage, and electric vehicles, to serve as valuable resources in reducing electricity system costs and economy-wide green-house gas emissions. She manages projects with utilities, regulators, and developers in performing cost-benefit analysis, evaluating policy impacts, and quantifying business opportunities for energy storage, electric vehicles, solar PV, and microgrids. She also conducts analysis to support utilities' and regulators' integrated resource planning process. In addition, she leads the development of E3's RESTORE model, an optimized DER dispatch model focusing on PV, storage, and electric vehicle that also optimizes the operation of fuel cell generators, smart water heaters, and smart HVAC systems while considering customer preferences. RESTORE has been used by California utilities for long-term planning and by state agencies, storage developers, and investment banks for project evaluation.

She is also leading the development of E3's Integrated Demand Side Management (iDSM) tool to identify least-cost integrated DER portfolios within target distribution areas. Ms. Ouyang joined E3 in 2015 after earning a Master of Science in Engineering from Johns Hopkins University, with a concentration in Environmental Management and Economics. Select projects at E3 include:

- **Locational Net Benefit Tool Training and DER Program Design for Los Angeles Department of Water and Power (LADWP), 2020-Present:** Leads the training for LADWP staff on a public tool developed by E3, the CEC solar + storage tool, with a focus on applying the tool for DER locational net benefit analysis. Performed cost-benefit analysis to assist LADWP's DER program design.
- **Colorado Energy Office Greenhouse Gas Emission Roadmap, 2019 – Present:** Technical lead on evaluating the effectiveness of a range of policy mechanisms to decarbonize the electric sector in Colorado using E3's optimal capacity expansion model (RESOLVE)
- **Electric Vehicle Program Evaluation for Portland General Electric (PGE), 2018-Present:** Leads the cost-benefit analysis for two EV pilots in PGE's territory – the Electric Avenues public charging program and the Trimet electric bus program
- **Tata Power Delhi Distribution Limited (TPDDL), 2018 – Present:** Technical lead on evaluating the economic case for implementation of large-scale distributed energy resources (DER) technologies within TPDDL's service territory on a project funded by the U.S. Trade and Development Agency (USTDA)
- **Minnesota Dept. of Commerce Energy Storage Cost-Benefit Analysis, 2019 – 2020:** Project manager for a cost-benefit analysis of energy storage in Minnesota over the next 10 years using E3's energy storage optimal dispatch tool, RESTORE, that delivered a public report summarizing findings and involved four public stakeholder workshops
- **California Energy Commission (CEC) EPIC Solar + Storage Tool, 2017 – 2020:** Project manager on developing the optimal dispatch model to estimate the value proposition of solar, storage, and

other distributed energy resources with a focus on their location on the system. E3 also hosted three public workshops to further introduce the tool to the general public

- **New York Power Authority (NYPA) EDGE, 2017 – 2018:** Project manager on examining the cost-effectiveness and business opportunities of multiple distributed energy resources, including solar + storage projects, across NYPA's service territory
- **Sumitomo Optimal Dispatch of Energy Storage, 2018:** Project manager on a storage evaluation for Sumitomo Electric's planned vanadium redox flow battery (VRFB) on the SDG&E distribution network for the purpose of clarifying VRFB advantages relative to Li-ion for maximizing revenue in the CAISO market and developing and refining optimal VRFB bidding strategies
- **Santa Monica Proposed Microgrid Evaluation, California Energy Commission, 2017 – 2018:** Project manager on evaluating the cost-effectiveness of the proposed Santa Monica City Yard (SMCY) Microgrid system from three perspectives: total resources (California as a whole), participants (Santa Monica), and other utility ratepayers
- **Pacific Northwest Low Carbon Scenario Analysis, 2017:** Explored the effectiveness of a range of policy mechanisms to decarbonize the electric sector in Oregon and Washington using E3's optimal capacity expansion model (RESOLVE)
- **PG&E Energy Storage Strategy, 2016:** Developed a storage dispatch optimization tool to investigate the value of behind-the-meter storage to customers and to the utility under customer control and utility control regimes. The model is designed to simulate the effects of any tariff design to calculate both the expected storage portfolio adoption over time, and the costs and benefits of that portfolio from customer and utility perspectives.
- **Storage Project Evaluations for developers and investment banks, 2016 – 2017.** Analyzed the value of storage projects for a couple of developers and investment banks to inform their investment decision and bidding strategy. Storage values are estimated under different future scenarios and with co-optimization of multiple revenue streams. Revenue streams includes wholesale energy market revenues, wholesale ancillary services revenues, customer bill savings, and customer reliability values. The analysis supported the \$200 million equity investment by Macquarie Capital to storage provider Advanced Microgrid Solution in 2016.
- **DER Evaluation Framework for Energy Research Institute in China, 2016 – 2017.** Worked with China Energy Research Institute (ERI) of National Development and Reform Commission to develop a DER evaluation methodology for China. The methodology heuristically dispatch EVs and batteries, and quantify the values of EV with managed charging, Battery, and DR from system operators, customers, generators, and society perspectives.
- **Hawaiian Electric Companies, 2015 – 2017.** Investigated the technical electricity system limits to integrating additional uncontrolled rooftop PV systems on each of the islands and what the integration solutions are to increase them. Participated in developing the E3 RESOLVE model for Hawaii that simulates system dispatch operations of all resource types. This model is used to develop a set of least cost investment pathways necessary to reach 100% renewables under different assumptions about policy and cost evolution out to 2045.
- **SMUD PV Integrated Energy Storage, 2015 – 2016.** Developed integrated distributed energy resources (IDER) models to quantify the operational and distribution planning benefits of customer and utility controlled PV integrated storage. The results were used to design utility sponsored programs that can incentivize retail customers to deploy energy storage with maximum net benefits.
- **Lower Valley Energy and Fall River Merger, 2016.** Conducted cost of service and rate design analysis to qualify the cost savings after merger and the merger impacts on customer rates for both group of customers

- **PG&E - Locational Distribution Avoided Cost Pilot Project, 2015.** Modeled local value from distributed energy resources through deferral of distribution system investments

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL ENGINEERING

Baltimore, MD

Johns Hopkins University – Research Assistant

June 2014 – January 2015

- Optimized long-run transmission expansion via AIMMS for the Western Electricity Coordinating Council (WECC)'s 10-year and 20-year Interconnection-wide Transmission Plan
- Filtered and aggregated data used in project via R and Excel
- Designed surveys in collaboration with other graduate students about 20-year projections from WECC stakeholders
- Summarized information, developing various scenarios based on stakeholders' opinions
- Gave presentations about project status to group members and to WECC

DEPARTMENT OF PATHOLOGY

Baltimore, MD

Johns Hopkins University – Programmer

October 2013 – February 2014

- Worked with a pathologist to conduct microRNA sequence quality assessments
- Performed large fastq format microRNA data analysis in R using statistical techniques and bioinformatics packages

SCHOOL OF ENVIRONMENT

Beijing, China

Tsinghua University – Undergraduate Researcher

January 2013 – July 2013

- Applied the polarity rapid assessment method (PRAM) to characterize nitrosamine precursors, an emerging approach to disinfecting by-products during water treatment

SCHOOL OF PUBLIC HEALTH

Los Angeles, CA

University of California, Los Angeles – Research Assistant

July 2012 – September 2012

- Applied the polarity rapid assessment method (PRAM) to characterize nitrosamine precursors in different periods of waste water treatment processing (i.e., outfall, mixed-media filters effluent, and secondary effluent)

Education

Johns Hopkins University

Baltimore, MD

M.S.E., Environmental Management and Economics

2014

Tsinghua University

Beijing, China

B. E. with Honors, Environmental Engineering

2013

Distinguished Thesis Award

2013

Hach Company Scholarship for Outstanding Water Researcher

2013

Veolia Company Scholarship for Outstanding Students

2011 – 2013

Tsinghua University Scholarship

2011 – 2012

Citizenship

China

Refereed Publications

1. *B. Hobbs, Q. Xu, J. Ho, P. Donohoo, S. Kasina, J. Ouyang, S. Park, J. Eto, V. Satyal, "Adaptive Transmission Planning: Implementing a New Paradigm for Managing Economic Risks in Grid Expansion", IEEE Power and Energy Magazine, 14(4), 30-40.*
2. *X. Liao, E. Bei, S. Li, Y. Ouyang, J. Wang, C. Chen, X. Zhang, S. Krasner, I.H. Suffet, "Applying the polarity rapid assessment method to characterize nitrosamine precursors and to understand their removal by drinking water treatment processes", Original Research Article, 292-298.*