Angineh Zohrabian, Ph.D.

44 Montgomery Street, Suite 1500, San Francisco, CA 94104
angineh.zohrabian@ethree.com

ENERGY AND ENVIRONMENTAL ECONOMICS, INC.   San Francisco, CA
Managing Consultant

Dr. Zohrabian specializes in resource portfolio planning for decarbonized electricity systems, utilizing data-driven methods and economic frameworks for decision-making. Her work primarily focuses on California's electricity system planning by supporting capacity expansion modeling for grid planning as well as achieving net zero emissions policy targets. Dr. Zohrabian's work also focuses on integrating emerging technologies, such as hydrogen and long-duration energy storage, into long-term capacity expansion models. Before joining E3, she earned a Ph.D. in Environmental Engineering from the University of Southern California, where she explored California's transition to clean power through greenhouse gas mitigation strategies, particularly in the intersection of water and energy systems. Her work has been published in journals such as Applied Energy, Energy Policy, and Journal of Cleaner Production.

Notable E3 projects include:

Integrated Resource Planning, California Public Utilities Commission (2021-ongoing). As part of the E3 team, Angineh is continuously supporting the CPUC in its IRP process in a wide range of workstreams including serving as technical advisor for capacity expansion modeling and portfolio development in the 2023-24 Preferred System Plan, 2025-2026 and 2024-2025 Transmission Planning Process. She manages E3's California RESOLVE model to incorporate new modeling features, improved user interface, documentation and results viewing, and she led capacity expansion modeling for CPUC's portfolio development in 2022-2024.

Consequential Impacts of Voluntary Clean Energy Procurement (2024). Technical lead for capacity expansion modeling of multiple clean energy targets in the CAISO's energy markets to evaluate the long-term impacts of corporate voluntarily clean energy procurement under different statewide policy scenarios.

California Air Resources Board, Senate Bill 1075 Analysis of Hydrogen in California (2024-present). Led the long-term hydrogen production cost analysis from various production pathways including electrolysis, and other pathways such as reformation and pyrolysis. Developed a comprehensive calculator to account for tax credit impacts as well as cap-and-trade policies and emissions footprint.

California Energy Commission, Techno-economic Hydrogen Analysis (2024-present). Technical lead for the RESOLVE modeling of investment decisions for hydrogen infrastructure and electricity system planning under zero emissions future. Engaged with funding partners to leverage industrial experience in inputs development.

Optimized Strategic Plan, Pasadena Water and Power (2024). Led the emerging technologies review and cost inputs development including for hydrogen and various storage technologies and advanced geothermal.

Zero Carbon Plan Sensitivities, Sacramento Municipal Utility District (2022-2023). Lead modeler of SMUD's system to identify different strategies for achieving its 2030 decarbonization goal in RESOLVE capacity expansion model.

2022 California Air Resource Board (CARB) Scoping Plan, 2021-2022: Performed the electric system capacity expansion modeling using the RESOLVE model, to unpack the resource needs for the State of California to achieve carbon neutrality by 2045.

The role and production of green hydrogen in a decarbonizing electric grid, confidential client, 2022: Modeled and characterized a hydrogen plant integrated into an electricity system. The project supported a project developer and a utility to better understand the unique features of their system and the costs and challenges of integrating a green hydrogen plant.

Lower Snake River dams power replacement, Bonneville Power Administration (BPA), 2022: Updated inputs and modeled a WECC-wide RESOLVE system to evaluate the cost and resource needs for replacing the energy and capacity value of the Lower Snake River dams in the Northwest in the context of deep decarbonizing scenarios.

Resource adequacy and reliability support for utilities in Arizona and Colorado, 2021-ongoing. Performed technical analysis using E3's loss-of-load probability model, RECAP, to explore the region's near-term and mid-term reliability needs considering a range of different climate, resource, and load uncertainties.

UNIVERSITY OF SOUTHERN CALIFORNIA   Los Angeles, CA
Graduate Teaching Assistant   August 2017 - May 2021
Graduate Research Assistant   August   2016 - May 2021

- o Developed methods that integrate high temporal and spatial resolution data from EPA and EIA to understand emissions from marginal generators to quantify the emissions tradeoffs of demand-side management strategies
- o Led a team of five students that reviewed electricity demand-side management opportunities in the water sector as well as water-related end-uses. In six months, wrote a white paper for Electric Power Research Institute by summarizing over 100 studies from various research entities such as national laboratories, consulting companies, and universities
- o As part of the project that guided the Los Angeles Department of Water and Power sustainable energy roadmap, collaborated with the National Renewable Energy Laboratory, working in the load forecast team to estimate electricity demand for future water needs in Los Angeles, considering the city's Sustainability Plan

SEED CONSULTING GROUP   Los Angeles, CA
Consultant   September 2020 - December 2021

- o In a team of 7, provided pro-bono business consulting to a sustainable agriculture non-profit

SHARIF ENERGY RESEARCH INSTITUTE   Tehran, Iran
Research Associate   December 2013 - February 2015

- o Contributed to develop analytical and experimental methods for assessing regional air emissions from Iran's upstream oil industry.
- o Performed process simulations and combustion reaction modeling

Education

University of Southern California	Los Angeles, CA
Ph.D., Environmental Engineering	2021

Sharif University of Technology	Tehran, Iran
M.S., Energy Systems Engineering	2014

University of Isfahan	Isfahan, Iran
B.S., Chemical Engineering – Process Design	2012

Publications

- o **Zohrabian A.**, Sanders K.T. (2021)*. Emitting less without curbing usage? Exploring greenhouse gas mitigation strategies in the water industry through load shifting.* Applied Energy, 298, 117194.

- o **Zohrabian A.**, Plata S.L., Kim D., Childress A.E., Sanders K.T. (2021). *A review of demand response opportunities in water supply and wastewater systems*. WIREs (Wiley Interdisciplinary Reviews) Water, 8:e1510.

- o **Zohrabian A.**, Sanders K.T. (2020)*. The energy trade-offs of transitioning to a locally sourced water supply portfolio in the City of Los Angeles.* Energies, 13 (21), 5589.

- o **Zohrabian A.**, Kelly T Sanders (2018). *Assessing the impact of drought on the emissions-and water-intensity of California's transitioning power sector*. Energy Policy, 123, 461-470.

- o Soltanieh M., **Zohrabian A.**, Gholipour M.J., Kalnay E. (2016). *A review of global gas flaring and venting and impact on the environment: Case study of Iran*. Int. J. Greenh. Gas Control, 49, 488-509.

- o **Zohrabian A.**, Mansouri M., Soltanieh M., Sattari S. (2016). *Techno-economic evaluation of an integrated hydrogen and power co-generation system with CO_2 capture*; Int. J. Greenh. Gas Control, 44, 94-103.

- o Sari A., **Zohrabian A.**, *Simulation study of the effect of feed moisture on autothermal reforming in short contact time catalytic micro* channels. Int. J. Hydrog. Energy, 39 (7), 3269-3285.