# Adrian Au

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

Since joining E3 in 2019, Adrian works primarily in E3's resource planning group, where he helps clients achieve deep decarbonization goals while maintaining reliability using E3's RECAP model. In addition, Mr. Au also supports the asset valuation and market forecasting group in resource procurement trends, capacity market policy, and resource capacity accreditation. Adrian's recent projects include performing reliability studies across the Western US, including exploring the benefits of a regional resource adequacy program in the Pacific Northwest, studying the near- and mid-term capacity need in the Desert Southwest, and studying the operational benefits of machine learning-derived operating reserves for the California Independent System Operator (CAISO). Other works also include capacity market policy support for Independent System Operator (ISOs) and energy and capacity price forecasting for major developers to inform resource investments and contracts.

Mr. Au joined E3 upon receiving his B.S. and M.S.E in Mechanical Engineering from Johns Hopkins University, where his graduate research focused on the optimal capacity expansion and resiliency in the natural gas and electricity transmission nexus under various energy resource and policy scenarios and optimal material selection photovoltaic cell design.

Some of Adrian's recent projects include:

**Consortium of Utilities in the Desert Southwest, *Resource Adequacy in the Desert Southwest* (2022)**
In the aftermath of recent blackouts in California and Texas, a group of utilities in the Southwest retained E3 to provide an independent assessment of the resource adequacy situation in the Desert Southwest region. Adrian led the technical analysis using E3's loss-of-load probability model, RECAP, to explore the region's near- and mid-term reliability need under different climate, resource, and load uncertainties.

**ARPA-E – DOE, *Deploying E3's RESERVE Tool to Enable Advanced Operation of Clean Grids* (2021).**
E3 developed the RESERVE modeling tool designed for system operators to dynamically calculate the need for operating reserves to mitigate system-wide risks from variability and forecast errors. Adrian supported RESERVE's python code development and quantified RESERVE-generated operating reserve's benefits on the CAISO footprint, using PLEXOS to assess the system's reduced production cost, reduced emissions, and improved operational reliability.

**Rye Development and National Grid, *Long-duration Storage's Role in the Pacific Northwest* (2021)**
With increasing electricity demand and coal retirements in the Pacific Northwest, E3 found the region faces a near-term capacity shortage of up to 7,000 megawatts (MW) by 2025 and up to 10,000 MW by 2030. In this study, Adrian quantified long-duration storage's value to the region's capacity position, its economic competitiveness, and its offtake opportunities for storage.

**CITY OF BALTIMORE, OFFICE OF SUSTAINABLE ENERGY** Baltimore, MD

*Energy Engineering Intern* June 2016 – July 2019

- Developed a demand response program to help reduce time-of-use rates for Baltimore City
- Identified energy savings through energy audits, heat transfer and thermodynamic analysis, and building load analysis
- Analyzed microgrid potential in the city's transport hubs to encourage more renewables and energy resilience

**THE JOHNS HOPKINS UNIVERSITY**
**DEPARTMENT OF MECHANICAL ENGINEERING** Baltimore, MD
*Graduate Research Assistant* September 2018 – July 2019

- Developed a capacity expansion model in GAMS for the North American grid for the Siddiqui lab
- Investigated the resiliency of the natural gas and electricity transmission network of North America under resource supply shocks and renewable energy policy scenarios

**THE JOHNS HOPKINS UNIVERSITY**
**OFFICE OF SUSTAINABILITY** Baltimore, MD
*Energy Analyst* August 2016 – May 2018

- Implemented a combined heat and power plant and a heat recovery chiller in two university-owned facilities
- Provided technical and market expertise on thermodynamic and mechanical devices for energy-efficient HVAC technology

## Education

The Johns Hopkins University Baltimore, MD
*M.S.E., Mechanical Engineering (Energy and the Environment)* 2019

The Johns Hopkins University Baltimore, MD
*B.S., Mechanical Engineering* 2018