

Patrick O’Neill

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC.
Managing Consultant

San Francisco, CA

Mr. O’Neill joined E3 in 2019 from the Irish Transmission System Operator EirGrid, where he conducted load flow analysis and constraint studies and coordinated closely with the Irish National Control Center. During graduate school, he helped create a framework for valuing energy storage for utilities and, as an intern at NRG Energy’s renewable business, developed resource plans for microgrids. Prior to graduate school, Mr. O’Neill conducted two years of laboratory research, first on lithium-ion batteries and then on tidal energy. Mr. O’Neill holds an M.S. in Civil and Environmental Engineering (Atmosphere/Energy) from Stanford University and a B.S. in Mechanical Engineering from Brown University.

Mr. O’Neill is heavily involved in a few practice areas within E3, including Market Design & Analysis, Transmission, and Resource Planning. He has led numerous studies involving evaluation of wholesale market benefits for interested parties, as well as analyses for entities interested in RTO integration. Mr. O’Neill has also worked with clients to help spread awareness of the benefits of transmission and understanding the barriers and solutions to effective intra- and inter-regional transmission planning.

Select E3 projects include:

- **Multiple Clients, Western Energy Imbalance Market (EIM) Analysis (2019 – 2021).** Mr. O’Neill conducted multiple studies for clients on the associated benefits in production cost savings that occur when participating in an energy imbalance market. He performed analysis on operational changes associated with joining the imbalance market for the jurisdictions, including changes in unit commitment, increased accommodation of less expensive renewable energy, and changes in unit-specific dispatch.
- **Western Energy Imbalance Market & Western Energy Imbalance Services (EIS) Comparison Analysis (2021).** Mr. O’Neill led the modeling effort in this study that looked at comparing the associated benefits in production cost savings that occur when joining the EIM or EIS real-time markets for a client. He performed analysis on operational changes associated with joining the two different imbalance markets for the client, including changes in unit commitment, increased accommodation of less expensive renewable energy, and changes in unit-specific dispatch. Since the EIS was not operational during this study, he and his team had to develop a modeling methodology specifically for this project to compare the benefits of joining these two real-time markets.
- **Confidential RTO Integration Study (2021-2022).** Mr. O’Neill led an analysis for a confidential client to assess the benefits and costs of joining an RTO. The analysis was conducted using PLEXOS production cost modelling to identify cost savings as a result of RTO participation and compared this to estimated costs.
- **Machine Learning Reserve Forecasting (2021).** Mr. O’Neill helped develop a PLEXOS model of the CAISO system in 2030 to highlight the effects of more intricate reserve forecasting; also, explores the effects of more flexible solar on reserves and overall production cost.

EIRGRID*Near Time Operations Engineer*Dublin, Ireland
August 2017 – July 2019

- Conducted continual studies to identify constraints, thermal overloads, and voltage violations on the system in order to assist the National Control Center in operating an N-1 secure system
- Developed a new procedure for generator testing under the new electricity market
- Commenced training to become a transmission control center operator in the National Control Center of the Irish TSO

UNIVERSITY COLLEGE DUBLIN*Post Graduate Research Fellowship*Dublin, Ireland
April 2017 – June 2017

- Performed literature reviews on combined generation and transmission planning; helped merge an AC optimal power flow model and a unit commitment model in Python

AURORA SOLAR*Business Analyst*Palo Alto, CA
January 2016 – March 2016

- Provided customer care solutions and fielded customer service inquiries after purchase; responsible for expansion into the academic sector by marketing the software for educational purposes

NRG ENERGY INC. – NRG RENEW*Intern*Scottsdale, AZ
June 2015 – August 2015

- Developed resource plans for microgrids as part of the Emerging Businesses and Technologies group of NRG Renew; sized solar arrays and optimized battery and other resources while minimizing cost
- Conducted research into solar + battery storage systems, providing an in-depth analysis of current pricing, market opportunities, and vendor propositions

THE SOLUTIONS PROJECT*Team Member*Stanford, CA
September 2014 – February 2015

- Worked on a method of matching supply and demand of electricity through storage applications that can be applied to many countries around the world

THE ENERGY TRANSFORMATION COLLABORATIVE*Team Member*Stanford, CA
September 2014 – December 2014

- Developed and planned the first stage of a distributed storage valuation method for municipal utilities

HARVESTING TIDAL ENERGY RESEARCH*Research Assistant*Providence, RI
September 2013 – May 2014

- Developed an optimization code for a wing type energy-harvesting object that incorporates frequency, pitch, and heave to establish parameters to maximize the harvesting of tidal energy

LITHIUM ION BATTERY RESEARCH

Research Assistant

Providence, RI
June 2012 – August 2013

- Investigated the effects of cycling rates on cathode material in lithium-ion batteries by observing the stress patterns during multiple lithiation and de-lithiation cycles; focused on innovative materials to improve lithium ion battery cycling; investigated anode material, cathode material, and the use of solid electrolytes

Education

Stanford University
M.S., Civil and Environmental Engineering (Atmosphere/Energy)

Stanford, CA
2016

Brown University
B.S., Mechanical Engineering (with Highest Honors)

Providence, RI
2014

Citizenship

United States, Switzerland