



# Paul Picciano

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## **ENERGY AND ENVIRONMENTAL ECONOMICS, INC.**

New York, NY

*Managing Consultant*

Mr. Picciano supports E3's Integrated System Planning and Climate Pathways and Electrification groups, evaluating clean electricity pathways for clients at the state, city, and utility levels. In his projects, he has conducted capacity expansion modeling for clients such as NYSERDA and supported integrated system planning efforts for Salt River Project. He also contributes expertise on topics such as affordability and social and non-energy benefits, especially air pollution reduction. He helped lead the integration of COBRA, an air pollution model, with E3's in-house PATHWAYS model. His affordability work spans both coasts, evaluating the bill impacts of net energy metering in Washington and analyzing customer affordability in New York.

Mr. Picciano joined E3 after earning his master's degree from MIT's Technology and Policy Program where he utilized energy and air pollution models to evaluate air quality-related health and equity impacts of U.S. decarbonization policy. Prior to MIT, he worked for three years at Resources for the Future, where he developed and applied power sector models to analyze policies related to carbon pricing and clean energy standards at federal and state levels and engaged with decision makers and stakeholders to communicate their effects and advise policy development. Before that, he evaluated energy and environmental regulations at NERA Economic Consulting, and researched wind and solar energy integration at the National Oceanic and Atmospheric Administration. In addition to his M.S., Mr. Picciano earned a B.A. in Environmental Economics from Pomona College.

Select E3 projects include:

**Salt River Project, Integrated System Plan (2022-2023).** Developed stakeholder material and completed complementary project management responsibilities for an E3 project completing one of the first integrated system plans in the United States, building a more integrated planning approach for SRP's electricity system over next decade and beyond. Developed a financial model to calculate total system costs through 2035 to support E3's calculation of key affordability metrics in the ISP. Developed inputs for capacity expansion modeling (carbon constraints, load data, etc.), and supported technical working sessions including organizing expert panelists and summarizing meeting outcomes.

**NYSERDA, Integration Analysis Technical Supplement to New York's Scoping Plan (2022-2023).** Completed model runs in RESOLVE, E3's electricity resource planning model, and analyzed outputs from the model as part of E3's detailed power sector modeling of the electricity system targets of New York's Climate Act. Implemented impacts of the IRA to incorporate tax incentives into updates of E3 modeling. Developed resource costs and ran sensitivities to understanding impacts of IRA on resource portfolio and costs.

**New York City, PowerUp NYC Long-Term Energy Plan (2022-2023).** As part of E3's development of New York City's first Long-Term Energy Plan, evaluated battery storage siting opportunities, completed geospatial analyses, and estimated storage development given a number of constraints.

**US Climate Alliance, Greenhouse Gas Emissions Scenarios through 2050 (2023).** As part of E3's update to its modeling and scenario analysis for USCA, integrated COBRA into the scenario development to add air quality modeling into E3's analysis of pathways for Alliance members to achieve Alliance-wide GHG emissions goals by 2050.

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**

*Graduate Research Assistant, Selin Group & MIT Joint Program*

Cambridge, MA

September 2020 – May 2022

- Evaluated air pollution-related health and equity impacts of US climate policy by utilizing economy-wide energy modeling outputs (from USREP-ReEDS) and a reduced-form atmospheric chemistry model (InMAP).
- Estimated future net benefits, including reductions in premature mortalities, that could result in the US by achieving emission reductions in line with Paris Agreement climate goals, and communicated results in a peer-reviewed publication and to Congressional staff members.

**RESOURCES FOR THE FUTURE**

*Senior Research Assistant, Energy & Climate Program*

*Research Assistant, Energy & Climate Program*

Washington, DC

April 2018 – July 2020

July 2017 – March 2018

- Extensively further developed the Engineering, Economic, and Environmental Electricity Simulation Tool (E4ST), a software package in MATLAB used for power system resource planning and optimization (dispatch and capacity expansion), benefit-cost policy analysis, and assessing environmental and health impacts from air pollution.
- Developed inputs and assumptions for the E4ST models of the Eastern, Western, and Texas Interconnections, including electric generating units, transmission lines and buses (nodes), policies, and more.
- Conducted detailed modeling studies of policy options for decarbonization of the electricity sector at the federal and state levels, including a proposed carbon price in New York and the Clean Energy Standard Act of 2019. Engaged with decisionmakers and stakeholders to communicate estimated effects of the policies and advise policy development.
- Projected effects of a Department of Energy proposal to subsidize unprofitable coal and nuclear power plants and published a peer-reviewed study that was cited extensively in media and in the Federal Energy Regulatory Commission's ruling document on the "Grid Resiliency Pricing Rule."
- Modeled optimal siting of solar arrays in Texas under ecological land restriction scenarios, implementing new power grid data for transmission lines and electrical busbars and high-resolution solar resource availability.
- Created a MATLAB replica of the Co-Benefits Risk Assessment (COBRA) tool used by the US Environmental Protection Agency, utilizing the underlying source-receptor matrix and descriptions of their air pollution dispersion and health-risk representations, and integrated it into the E4ST power system model.

**NERA ECONOMIC CONSULTING**

*Research Associate, Energy and Environmental Economics Practice*

Washington, DC

July 2016 – July 2017

- Conducted economic analysis of energy and environmental regulations, employing NERA’s electric sector optimization model as well as health-risk assessment tools such as EPA’s BenMAP program to assess changes in air quality levels.

**NOAA, EARTH SYSTEM RESEARCH LABORATORY**

*Ernest F. Hollings Undergraduate Scholar & Research Intern*

Boulder, CO  
May 2015 – May 2016

- Researched wind and solar energy integration in the US under potential future electricity scenarios, including wholesale market expansion and new transmission infrastructure. Supported modeling analysis using the National Energy with Weather System (NEWS) Simulator, an optimization model of the U.S. electric power grid. (With Dr. Christopher Clack)

**Education**

Massachusetts Institute of Technology  
*M.S., Technology and Policy*

Cambridge, MA  
2022

Pomona College  
*B.A., Environmental Economics*

Claremont, CA  
2016

**Refereed Publications**

1. Picciano, Paul, Minghao Qiu, Sebastian D. Eastham, Mei Yuan, John Reilly, and Noelle E. Selin. “Air Quality Related Equity Implications of U.S. Decarbonization Policy.” *Nature Communications* 14, no. 1 (September 19, 2023): 5543. <https://doi.org/10.1038/s41467-023-41131-x>.
2. Yuan, Mei, Alexander R Barron, Noelle E Selin, Paul D Picciano, Lucy E Metz, John M Reilly, and Henry D Jacoby. “Meeting U.S. Greenhouse Gas Emissions Goals with the International Air Pollution Provision of the Clean Air Act.” *Environmental Research Letters* 17, no. 5 (May 1, 2022): 054019. <https://doi.org/10.1088/1748-9326/ac6227>.
3. Picciano, Paul, Francisco X. Aguilar, Dallas Burtraw, and Ashkan Mirzaee. “Environmental and Socio-Economic Implications of Woody Biomass Co-Firing at Coal-Fired Power Plants.” *Resource and Energy Economics* 68 (May 2022): 101296. <https://doi.org/10.1016/j.reseneeco.2022.101296>.
4. Shawhan, D.L., and P.D. Picciano. “Costs and Benefits of Saving Unprofitable Generators: A Simulation Case Study for US Coal and Nuclear Power Plants.” *Energy Policy* 124 (2019). <https://doi.org/10.1016/j.enpol.2018.07.040>.

**Select Presentations**

1. “Clean Energy Standards and Alternative Policy Mechanisms for Electricity Sector Decarbonization: An Overview and Comparative Analysis” (with Kevin Rennert and Daniel Shawhan). 2019. RFF Clean Energy Standards Capitol Hill Briefing. US Capital Visitor Center, Washington, DC.

2. "Costs and Benefits of Saving Unprofitable Generators: A Simulation Case Study for US Coal and Nuclear Power Plants" (with Daniel Shawhan). 2018. *2018 Trans-Atlantic Infraday Conference (Energy and Policy)*. Federal Energy Regulatory Commission, Washington, DC.
3. "Policy Implications for an Optimized Electric Power System Utilizing a National High-Voltage Direct-Current Transmission Network" (with Christopher Clack, Julia Paine, and Leigh Terry). 2016. American Meteorological Society (AMS) 2016 Annual Meeting, New Orleans, LA.