Elizabeth (Liz) Mettetal, Ph.D.

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC.   Boston, MA
Director

Based in Boston, Dr. Mettetal is an experienced energy economist who leads studies in E3's Integrated Systems Planning practice. Her work provides clients with rigorous technical and economic analysis on a range of energy topics, including long-term resource planning, reliability and resource adequacy, electrification and DERs, renewable deployment and the role of energy storage, hydrogen and other low-carbon fuels, and the value of transmission. At E3, Dr. Mettetal has managed several studies evaluating the feasibility and costs of scenarios that transition to a low-carbon future using E3's electricity capacity expansion and loss-of-load probability models. Her studies and strategic advisory support enable states, utilities, regulators, and other energy industry stakeholders to make informed decisions pertaining to investments in clean energy and electric sector reliability in futures with high levels of renewable energy.

Prior to E3, Dr. Mettetal worked in energy and environmental consulting at Abt Associates and NERA Economic Consulting, where she oversaw and performed economic analyses for utilities and federal agencies on topics related to energy, water, waste, air quality, climate change, and transportation. Dr. Mettetal has also taught environment and climate economics at Harvard University, where she is an alumna of the Harvard Environmental Economics Program. Dr. Mettetal holds a Ph.D. in Public Policy from Harvard University and a B.S. in Environmental Engineering Science, with a minor in Economics, from the Massachusetts Institute of Technology.

Selected projects at E3 include:

o **Massachusetts Clean Energy Center, Energy Storage Market Update and Long-Duration Storage Analysis, 2023.** Dr. Mettetal led E3's support for the state of Massachusetts in evaluating the outlook for short-duration and long-duration storage in the near-term and long-term. The study included a robust assessment of the potential reliability contributions of a range of storage resources, using a loss-of-load probability model (E3'S RECAP) to assess effective capacity contributions under a range of potential futures. The study also included significant stakeholder engagement.
o **Manitoba Hydro, Integrated Resource Plan, 2023.** Dr. Mettetal led and supported E3's advisory support for Manitoba Hydro's first IRP, including providing feedback on modeling approach, key input assumptions, scenario design, modeling results, and stakeholder engagement.
o **Confidential client, Evaluate potential for emerging technology deployment, 2023.** Dr. Mettetal led E3's evaluation of the potential for a specific (confidential) emerging technology to support the company decarbonization goals, including identifying potential sites, opportunities and barriers analysis.
o **New York Storage Roadmap Update, 2022-2024.** Dr. Mettetal managed E3's support for NYSERDA and the Department of Public Service in the development of New York's storage roadmap update. The Roadmap outlined a path to achieve Governor Hochul's target of deploying six gigawatts of battery storage by 2030, and detail how this target supports New York's broader clean energy goals. This

study included performing capacity expansion modeling using E3's RESOLVE model, and building out detailed financial modeling of storage costs.

o **Electrification Strategy, Nova Scotia Power, 2022-2023**. Dr. Mettetal led E3's technical analysis and strategic advisory support for Nova Scotia Power in the development of its electrification strategy, an action item coming out of the utility's 2020 Integrated Resource Plan. This study included building a detailed cost-benefit calculator to assess the costs and benefits of electric vehicle and heat pump adoption to customers, ratepayers, and the province.

o **Decarbonization Strategy, New Brunswick Power, 2022.** Dr. Mettetal led E3's support for New Brunswick Power's decarbonization study, which focused on the role of the Atlantic Loop (transmission) and other potential decarbonization solutions to achieving provincial Net Zero. The study relied on electric sector modeling tools, including a loss-of-load probability model (E3's RECAP) and capacity expansion modeling and production simulation (PLEXOS LT/ST), to assess key reliability metrics, develop optimal resource portfolios, and ensure renewable integration and operability requirements are met under scenarios consistent with decarbonization goals.

o **Maine Energy Storage Market Assessment, 2021-2022.** Dr. Mettetal led the development of E3's study assessing pathways to Maine's 400 MW by 2030 storage target. During the development of this work, Dr. Mettetal led several public stakeholder sessions in which she presented the approach and findings of this study to stakeholders throughout the region.

o **Maine Renewable Energy Goals Market Assessment, 2020-2021.** Dr. Mettetal served as a study lead and advisor for E3's study of the opportunities, potential, and challenges facing the state in reaching Maine's 80% RPS by 2030. Dr. Mettetal also led multiple public stakeholder sessions where she presented the findings from this study.

o **National Deep Decarbonization Technical Analysis, World Resources Institute, 2020-2021.** Dr. Mettetal served as the project manager for E3's technical modeling of economy-wide decarbonization scenarios for the World Resources Institute. The study evaluated the potential effect of high-impact federal policies, including tax credits and spending and policy incentives, on deep decarbonization across the U.S. using E3's PATHWAYS and RESOLVE models.

o **Net-Zero New England: Ensuring Electric Reliability in a Low Carbon Future, Calpine Corporation, 2019-2020 (joint with Energy Futures Initiative).** Dr. Mettetal served as the project manager and lead for E3's study to evaluate electricity sector reliability under resource portfolios consistent with New England achieving economy-wide Net Zero greenhouse gas emissions. This study involved detailed modeling of New England reliability using loss-of-load probability modeling, as well as capacity expansion modeling to derive optimal resource portfolios.

o **Integrated Resource Planning Support, Nova Scotia Power, 2019-2020**. Dr. Mettetal managed E3's support for NS Power's 2020 IRP, which included development of long-term electricity resource plans that align with aggressive clean energy goals. Using E3's RESOLVE and RECAP models, Dr. Mettetal and her team identified optimal resource investment portfolios under scenarios designed to reach net-zero emissions by 2050, while ensuring reliability and cost-effectiveness.

o **Hydrogen Opportunities in a Low-Carbon Future, Mitsubishi Hitachi Power Systems, 2019.** Dr. Mettetal served as the project manager for E3's analysis of the potential for green hydrogen to serve as a source of zero-carbon energy across buildings, transportation, industry, and the power sector, relying on E3's economy-wide GHG accounting model (PATHWAYS) and storage dispatch model (RESTORE). E3 demonstrated significant opportunities for hydrogen as long-duration storage in the West.

ABT ASSOCIATES Cambridge, MA
Associate September 2017 – June 2019

- o Managed and performed economic analyses for federal agencies on topics related to energy, natural gas, water, waste, air quality, climate change, and transportation. Main clients included U.S. Environmental Protection Agency (EPA), U.S. Pipeline and Hazardous Safety Administration (PHMSA), and National Oceanographic and Atmospheric Administration (NOAA).
- o Conducted regulatory impact analysis, cost-benefit analysis, economic impact assessments, uncertainty analysis, and applied econometric and statistical analysis. Analyses regularly withstood rigorous review and external evaluation by policy stakeholders.
- o Senior economist on team that won company-wide Abt Technical Innovation Award (2018) for work building modeling tools that evaluate economic and environmental impacts of solid waste management strategies.

NERA ECONOMIC CONSULTING   Boston, MA
Consultant   April 2015 – August 2017

- o Provided expert consulting services on the economics of environmental and energy policies related to air quality, water, climate change, and the electric grid.
- o Managed and performed analysis evaluating the economic and environmental impacts of potential electricity resource alternatives for a major western utility's Integrated Resource Planning (IRP) process.
- o Contributed to writing testimonies and expert reports submitted to the Court, public utility commissions, and other regulatory proceedings.

HARVARD UNIVERSITY   Cambridge, MA
Teaching Assistant   February 2011 – May 2013
Research Assistant   April 2010 – June 2014

- o Head Teaching Fellow for undergraduate/masters-level Fundamentals of Environmental Economics and Policy for Professor Robert Stavins (Spring 2011-2013)
- o Teaching Fellow for masters-level Advanced Microeconomics Analysis for Professor Chris Avery (Fall 2011)
- o Research Assistant to Professor Robert Stavins, Professor Rohini Pande, and Professor Michael Kremer on projects related to environmental/energy economics and development economics

TECHNOSERVE   Mozambique
Consultant   June 2008 – May 2009

- o Performed financial and strategic analyses to build sustainable businesses, increase economic growth, and reduce poverty.
- o Main project involved researching interactions between human and environmental health in Nampula province, organizing workshop for key stakeholders to contribute and share insights, and providing integrated planning recommendations for NGOs, government, and investors.

MCKINSEY & COMPANY   Washington, DC
Business Analyst   September 2006 – June 2008

- o Served private, public, and social sector clients on consulting projects related to organizational challenges and business opportunities.

- o Selected projects include creating a growth strategy for a city development organization; quantitative analysis of potential gains from improvements in claims processing for a major health insurance company; and evaluating and redesigning the incentive structure for call center agents at a financial services company.

Other Experience

Visiting Lecturer   Spring 2023
Department of Economics, Harvard University
- o Taught an undergraduate and masters-level course titled *Economics of Climate Change and Environmental Policy* in the Spring 2023 semester.

Education

Harvard University   Cambridge, MA
Ph.D., Public Policy   2015

Massachusetts Institute of Technology   Cambridge, MA
B.S., Environmental Engineering Science; Minor in Economics   2006