

## Overview

Dr. Emma Fox (she/her) specializes in a range of quantitative and qualitative methodologies for program evaluation and case study including survey design, in-depth interviews, and focus groups. She has conducted in-depth interviews, focus groups, and surveys for targeted and general population sampling for state and federal clients, including NYSERDA, EPA, U.S. Bureau of Ocean Energy Management (BOEM), and California Air Resources Board (CARB). Dr. Fox's work utilizes mixed methods for case study and evaluation, including evaluating the effectiveness of community outreach and engagement for improving market uptake of clean energy services, assessing the broader benefits associated with transportation projects, characterizing cross-organization information flows, benchmarking best practices, and assessing program implementation in response to energy and climate policies.

## Education

Doctor of Philosophy in Ecology & Environmental Science, University of Maine, ME  
Master of Science in Ecology & Environmental Science, University of Maine, ME  
Bachelor of Science in Biology, Saint Michael's College, VT

## Project Experience

For the **NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA) CLEAN TRANSPORTATION PRIZE (CTP) PROGRAM**, leading the qualitative data analysis for an ongoing process evaluation of the CTP request for proposals (RFP) response process. The process evaluation is designed to identify the success and opportunities for improvement in the program's design and implementation, particularly in the authentic and effective engagement of community stakeholders. The CTP program utilized a phased prize distribution and a unique RFP response process that provided support for applicant proposal development, including compensation for locally based organizations who might not be familiar with the traditional NYSERDA procurement process.

For the **U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), OFFICE OF POLICY**, Dr. Fox is developing a series of case studies and a cross-cutting summary analysis to support EPA's evolving understanding of plastics pyrolysis facility operations. The purpose of the case studies is to describe known features, document data availability and limitations, and characterize the state and federal regulations identified by the facilities' air permits and stormwater permits in this quickly-evolving industry.

For the **U.S. EPA, OFFICE OF POLICY Smart Sectors Program**, leading a literature review-based analysis of the beneficial reuse of coal combustion residuals (CCR) in concrete, concrete products, and cement. The analysis explores the technical, economic, environmental, logistical, and regulatory aspects of CCR reuse.

For the **NYSERDA**, leading the analysis on a case study focused on the machine learning-based artificial intelligence modeling projects. The model predicts equipment failure and has been applied to both electricity transmission and distribution and offshore wind electricity generation equipment.

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# IEc

For the **NYSERDA INNOVATIVE MARKET STRATEGIES (IMS)**, leading the analysis on an evaluation focused on leveraging community social capital for building decarbonization in New York State. The theory of change for this project identifies the need for demonstrations of clean energy retrofits and installations, energy efficiency measures, and renewable energy projects within disadvantaged communities to showcase energy and cost savings benefits and build trust in the building decarbonization market. This evaluation is part of a larger suite of ongoing evaluations for NYSERDA's IMS Program.

For the **NYSERDA REGIONAL CLEAN ENERGY HUBS (RCEH)**, leading the analysis on a multi-year evaluation effort aimed at assessing the effectiveness of outreach and engagement from Hubs and their partner organizations to NYS consumers, with a focus on consumers in disadvantaged communities. This evaluation will assess changes to consumer awareness of clean energy services and programs provided by NYSERDA, NY utilities, and other NY State agency partners; document changes in workforce participation by underrepresented demographics and energy sector participation by service-disabled veteran-owned businesses and women-owned small businesses; and characterize barriers to participation in clean energy service programs in disadvantaged communities.

For the **BUREAU OF OCEAN ENERGY MANAGEMENT (BOEM)**, supporting a multi-year evaluation of internal and external information feedback loops aimed at describing data generation (studies) and use (assessments). Dr. Fox programmed and analyzed the web based BOEM staff survey and conducted 10 in-depth staff interviews to validate and contextualize survey findings in Year 2. In Year 3, Dr. Fox conducted ~30 in-depth interviews with stakeholders external to BOEM and led the interview analysis in NVivo, including codebook development, quality assurance, and theme identification. Dr. Fox developed findings and recommendations for the Year 3 evaluation report.

For **NYSERDA**, supported ERG and CALSTART in the development of School Bus Electrification Guidebook for Fleets and Roadmap to achieving New York's school bus fleet electrification goals. As a part of this effort, Dr. Fox supported the development of a list of key equity considerations for a just transition to electrification, including assessing the needs of underserved and disadvantaged communities, as well as hard-to-reach rural areas in electric school bus deployment.

For the **U.S. EPA, OFFICE OF CONTINUOUS IMPROVEMENT (OCI)**, led the analysis in an evaluation of EPA's Lean Management System (LMS) deployment from 2019 – 2021. Analyzed and summarized historical data from the Continuous Improvement Management Database for key program metrics including staff deployed per office, staff ideas implemented, and processes improved. Conducted and analyzed multiple focus groups, interviews, and a survey to characterize the nature, extent, and comparative success of deployment across EPA's Regions and National Program Managers in a final evaluation report to the client. Presented preliminary findings at the 2022 Continuous Improvement Management Summit.

For the **U.S. EPA, NATIONAL CENTER FOR ENVIRONMENTAL ECONOMICS (NCEE)**, supporting the client in revising the *2016 Environmental Justice Technical Guidance* with information from a series of focus groups with EPA's program offices involved in rulemaking. Dr. Fox qualitatively analyzed discussion notes and voting activity from a series of nine focus groups and developed a summary of topic-level and thematic findings detailing areas of environmental justice technical guidance (methods, data, and communication support) needs at EPA. Using these findings, Dr. Fox revised Ch. 7 of the *Environmental Justice Technical Guidance*.

# IEc

For the **U.S. EPA, OFFICE OF RESOURCE CONSERVATION AND RECOVERY (ORCR)**, in response to an information request from Congress, reviewed and summarized published proposals, reports, and white papers for recycling infrastructure and policy transformation in the U.S. Identified trends in proposed infrastructure solutions using qualitative coding to identify trends in materials focus, elements of the recycling system (e.g., generation, collection, sortation, recycling end markets for circularity), and other key variables. Identified investment cost ranges and critical information gaps in the literature to inform a financial needs assessment. Developed a financial needs assessment for expanding packaging material recycling in all 50 states, including education needs.

For the **U.S. EPA, OFFICE OF LAND AND EMERGENCY MANAGEMENT (OLEM)**, led a formative evaluation of the Superfund Lead Collaboration Pilots program. In 2022, EPA piloted a Collaboration Guide for lead work at Superfund sites in each of the 10 EPA Regions. EPA regions each identified a pilot site or process at which to test the role of a “convener” and draft collaboration guidance. Developed a conceptual framework for evaluating site collaborations toward addressing non-Superfund lead sources, conducted baseline, mid-point, and end-point convener surveys and in-depth interviews to explore progress in cross-agency and interagency collaboration at each of the pilot Superfund sites.

For the **U.S. EPA, OFFICE OF INTERNATIONAL AND TRIBAL AFFAIRS (OITA)**, supported the American Indian Environmental Office’s development of the 2022 Indian Environmental General Assistance Program (GAP) Guidance. Dr. Fox worked with the client and project team to refine indicators to gauge Tribes’ capacity development toward the implementation of EPA-administered environmental programs and solid waste management. Dr. Fox developed training materials for Tribes and EPA Regional Program Officers, and summarized Tribes’ comments on GAP Guidance and GAP Allocation revisions to facilitate client response.

For the **NYSERDA CLEAN TRANSPORTATION PROGRAM**, Dr. Fox co-developed a case study to highlight the benefits from a Shared Mobility Network project by contractors Shared Mobility, Inc., funded by NYSERDA. The Shared Mobility Network funding was an early effort by NYSERDA to address equity in the transportation sector, with carshare and bikeshare programs in several municipalities, van pools, and volunteer transportation efforts all designed to improve mobility in upstate New York. Using a combination of interviews and secondary research, the case study measured benefits including project continuation efforts, total greenhouse gas emissions reductions, health benefits, vehicles shed, and access (i.e., “walkable to shared mobility services (e.g., carshares and bikeshares) in disadvantaged communities.

For the **U.S. EPA, OLEM**, Dr. Fox was part of a multidisciplinary team identifying methodologies for characterizing and addressing community vulnerabilities related to climate change and disproportionate impacts from environmental hazards. The strategy focused on: 1) collaboration with and leadership by historically under-represented and under-served communities, 2) an examination of Agency structures, practices, and cultural norms that can perpetuate disparities, 3) identification of the community impacts specific to OLEM’s mission, and 4) review of effective methodological options for addressing limitations of traditional economic methods and assumptions including equity weighting, cumulative risk and burden assessment, and spatial data to support quantification and visualization of new metrics. The study aimed to reflect on existing OLEM policy and inform policy options going forward to advance equity goals.

For the **NYSERDA, CLEAN TRANSPORTATION PROGRAM**, evaluated the deployment of the EV (electric vehicle) Innovation program and Public Transportation and Electrified Rail initiative in NY, to measure

the progress as a result of New York Clean Energy Fund investments. Coordinated with subcontractors for primary data collection from NYSERDA's innovation partners and transit agencies around the state, including in-depth interviews and web survey deployment. Analyzed key metric performance for EVs, EV charging stations, transit, and equitable access to EV technology. Reviewed and compiled subcontractor findings and drafted an evaluation report for the client.

For the **NYSERDA, COMMUNITY ENERGY ENGAGEMENT PROGRAM (CEEP)**, led the analysis for a process evaluation and market characterization, identifying key successes and barriers in to extending program reach across ten economic regions through local partnerships and customer engagement. Dr. Fox conducted primary data collection and analysis efforts for this project, including developing semi-structured interview guides, designing web and phone survey instrument, and conducting in-depth interviews with CEEP contractors and their partner organizations. Dr. Fox qualitatively analyzed interview data for themes, designed and supervised survey administration, and synthesized findings from survey and interview data to provide recommendations to the client for future program improvement.

For the **NYSERDA INNOVATIONS PROGRAM**, developed a set of tools to measure market transformation in NY. Reviewed selected literature on smart grid, distributed energy generation, and clean transportation performance to identify high-level (macroeconomic) and sector-specific metrics for market transformation. Identified regularly updated and publicly available data sources, and developed tools for tracking decarbonization in NY Independent System Operator (NYISO)-reported fuel mix for daily peak generation, as well as Federal Highway Administration highway gasoline/special fuel intensity over time. Both tools track broad, macroeconomic-level indicators of market transformation.

For the **NYSERDA, QUALITY ASSURANCE PROGRAM**, led the analysis for a benchmarking study for energy installation contractor quality assurance/quality (QA/QC) control. Dr. Fox developed semi-structured interview guide and conducted in-depth interviews with quality assurance program managers in other states to benchmark NYSERDA's quality assurance. Reviewed and thematically coded QA/QC policies and procedure documents as well as interview data to develop recommendations. Prepared the client memorandum and addendum for the final benchmarking report.

For the **U.S. EPA, OCI**, analyzed interview and focus group data to assess return on investment, successes, and challenges encountered in OCI Lean Management System (LMS) problem solving trainings. Problem solving trainings were implemented to develop a Problem-Solving Corps at EPA to bolster continuous improvement efforts and provide troubleshooting support for project teams. Contributed to the writeup of interview and focus group evaluation results for the client report.

For the **CALIFORNIA AIR RESOURCES BOARD**, in a case study on renewable diesel and its co-products, evaluated benefits relating to Assembly Bill 32 Global Warming Solutions Act of 2006 (AB 32). Reviewed related policy/implementing mechanisms (e.g., the California Low Carbon Fuel Standard, LCFS, and the Federal Renewable Fuels Standard, RFS) and identified fuels and fuel brought to market in California as a result of AB 32 legislation to determine the scope of the study. Using feedstock and fuel production reporting data from the LCFS and RFS programs, analyzed the influence of credit pricing on fuel production increases over time. Conducted interviews with academic subject matter experts and industry representatives to validate fuel production, feedstock, and facility construction data. Estimated facility construction and conversion costs for use in an economic impact analysis.

# IEc

For the NATIONAL SCIENCE FOUNDATION (NSF), Dr. Fox led the development and workshop implementation of a participatory multi-criteria decision support tool designed to support decision-making in the Penobscot River watershed in Maine. She also contributed to a weighting scheme for a machine learning-based tool for prioritizing dam removals within a watershed based on making efficient tradeoffs between social, economic, and ecosystem factors (published in the Proceedings of the National Academy of Sciences, [2018](#)).

## Select Reports and Publications

IEc. 2024. *NYSERDA Case Study: Shared Mobility Network*. Prepared for New York State Energy Research and Development Authority. Contract Agreement No. 151662.  
<https://www.nyserdera.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/Program-Evaluation/Transportation/Matter-No1602180NYSERDASharedMobilityNetworkCaseStudyMarch-2024.pdf>

Kaufman, Daniel; Flight, Maura; Foley, Catherine; Arthur, Courtney; Bunting, Kieran; Englehart, Greg; Fox, Emma; Bombard, Keeley; Farrell, Antonia; Harris, Carly (Industrial Economics, Inc. (IEc), Cambridge, MA). 2023. *Evaluating connections: BOEM's environmental studies and assessments, external evaluation findings and recommendations*. Cambridge (MA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 94 p. Task Order No.: 140M0119F0039.

IEc, DNV, RMS, Dr. David Keith, Mobilyze.ai, Cheng Solutions, and Sunrail Consulting. 2022. *Clean Transportation Market and Impact Evaluation: Market-Level and Cross-Cutting Insights*. Prepared for New York State Energy Research and Development Authority (NYSERDA). Contract Agreement No. 151662.  
<https://www.nyserdera.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/Program-Evaluation/Transportation/2022-12-Clean-Transportation-Market-Impact-Evaluation-CrossCuttingInsightsReport.pdf>

Kaufman, Daniel; Flight, Maura; Foley, Catherine; Arthur, Courtney; Bunting, Kieran; Fox, Emma; Englehart, Greg; Smalley, Paige; Huang, Justine (Industrial Economics, Inc. (IEc), Cambridge, MA). 2021. *Evaluating connections: BOEM's environmental studies and assessments, findings and recommendations*. Cambridge (MA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 128 p. Task Order No.: 140M0119F0039.

IEc. 2021. *Community Energy Engagement Program (CEEP) Process Evaluation and Market Characterization Report*. Prepared for NYSERDA, Contract Agreement No. 151662.  
<https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2021-NYSE RDA-Community-Energy-Engagement-Program-Evaluation-Report.ashx>