



# Sharad Bharadwaj

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

San Francisco, CA

Mr. Bharadwaj joined E3 in 2015 after receiving both his M.S. and B.S. degrees in Energy Resources Engineering from Stanford University. His work focuses on analyzing and modeling long-term greenhouse gas reduction strategies in the energy economy, and on combining E3's strengths in electricity planning and markets with a broader economy-wide perspective on how the transportation, buildings, and industrial sectors may evolve over time. He served as the lead modeler on recent decarbonization studies in Oregon and Washington. Select E3 projects include:

- **State Energy Agency, 100% Renewable Energy Analysis (2017 – Present).** Supporting a state energy agency in exploring the feasibility, timing, and cost of achieving a 100% renewable energy future. E3 is using the LEAP model to create scenarios of energy end-use demands over time and the RESOLVE model to develop optimal electricity capacity portfolios at high renewable penetrations.
- **NW Natural, Pacific Northwest Pathways to 2050 (2018).** Analyzed deep decarbonization scenarios for the Pacific Northwest with a focus on space heating technologies and trade-offs associated with electrification vs. continuing the direct use of natural gas to identify cost-effective approaches to reducing regional economy-wide emissions 80 percent below 1990 levels by 2050.
- **South Carolina Office of Regulatory Staff (2018).** Supported ORS in analyzing avoided costs and the value of distributed energy resources (DER) under South Carolina Act 236, with a focus on successor approaches to net energy metering. Convened and explained modeling results to a large and diverse stakeholder group and prepared a summary report reflecting ORS, utility, and stakeholder perspectives.
- **Hawaiian Electric Companies (2015 – 2016).** Developed a set of least-cost investment solutions necessary to reach state renewable portfolio standards of 100% by 2045 and tested them under various technological and pricing uncertainties to help guide policy and investment decision-making on the island.
- **Kansas Electric Power Cooperative (2016).** Provided research and strategic advice to Kansas Electric Power Cooperative Board of Directors regarding the Cooperative's planning for optimal generation investment and expansion.
- **Oregon Department of Environmental Quality (2016).** Assisted the Oregon Department of Environmental Quality by performing an economic analysis of a market-based carbon reduction program and modeling potential economic effects on Oregon specifically.

## **STANFORD UNIVERSITY**

*Research Assistant*

Palo Alto, CA

September 2014 – June 2015

- Estimated greenhouse gas emissions from the Bakken region by applying statistical learning and image processing techniques on NOAA satellite weather data.

**ARPA-E: U.S. DEPARTMENT OF ENERGY**

Washington, DC

*Tech2Market Summer Scholar*

Summer 2014

Characterized “state of the landscape” for grid-scale energy storage modeling software

- Identified appropriate range-finding tools for early stage grid storage technologies
- Beta tested models to guide refinement of future ARPA-E storage technology performance metrics

**STANFORD UNIVERSITY**

Palo Alto, CA

*Oral Communication Tutor*

September 2013 – June 2015

- Helped students improve their oral communications (presentations, interviews, and speeches)

**UTILIDATA, INC.**

Providence, RI

*Product Engineer Intern*

Summer 2013

- Under R&D team, modified specification to define signal structure for new version of AdaptiVolt product
- Under QA team, performed systems engineering and testing of development code
- Assisted R&D and QA teams with server configuration, bug identification

**LANL SUMMER OF APPLIED GEOPHYSICAL EXPERIENCE**

Los Alamos, NM

*Participant*

Summer 2013

- Characterized Espanola basin with seismic, gravity, and electromagnetic tools
- Identified possible subsurface aquifers using signal processing and inverse modeling techniques

**STANFORD UNIVERSITY**

Palo Alto, CA

*Research Assistant*

June 2011 – August 2012

- Characterized European crude oils by greenhouse gas intensity of production and extraction
- Created a production-weighted baseline of current EU crudes’ greenhouse gas emissions
- Performed historical life cycle analysis of Albertan oil sands to calculate energy return ratios, and greenhouse gas intensities, of the extraction and production of bitumen over time

**Education**

Stanford University

Palo Alto, CA

*M.S., Energy Resources Engineering*

2015

Stanford University

Palo Alto, CA

*B.S., Energy Resources Engineering*

2014

**Refereed Publications**

1. “The energy efficiency of oil sands extraction: Energy return ratios from 1970 to 2010,” Brandt, Englander, Bharadwaj. June 2013. *Energy: The International Journal*.
2. “Historical trends in life cycle GHG emissions of the Alberta oil sands from 1970 to 2010,” Englander, Bharadwaj, Brandt. November 2013. *Environmental Research Letters*.