Sharad Bharadwaj

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC. San Francisco, CA
Consultant

Mr. Bharadwaj joined E3 in 2015 upon receiving both his M.S. and B.S. degrees in Energy Resources Engineering from Stanford University. His studies included applied mathematics, system engineering, renewable energy processes, and emerging technologies. Mr. Bharadwaj brings research experience on the topics of energy storage modeling, data analysis, and analysis of Greenhouse Gas emissions. Contributions to selected projects include:

- **Hawaiian Electric Companies, 2015-2016.** Developed a set of least cost investment solutions necessary to reach state renewable portfolio standards of 100% by 2045; these solutions were tested under various technological and pricing uncertainties to help guide policy and investment decision making on the island. This project used the E3 RESOLVE model to simulate system operations and perform optimal investment.
- **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.** E3 assisted the Oregon Department of Environmental Quality by performing an economic analysis of a potential market-based carbon reduction program in Oregon. The study involved reviewing economic literature to characterize current understanding of economic effects of implementing carbon markets, and creating an economic model to estimate the potential economic effects to Oregon particularly.

STANFORD UNIVERSITY Palo Alto, CA
Research Assistant September 2014 – June 2015

- Used statistical learning techniques with satellite weather data to estimate greenhouse gas emissions from Bakken well flares.

ARPA-E: US DEPARTMENT OF ENERGY
Tech2Market Summer Scholar Summer 2014

- Characterized "state of the landscape" for grid-scale energy storage modeling software.
- Identified appropriate models as useful 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

- Assisted students prepare for presentations, interviews, speeches, and conferences.

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 rations, and greenhouse gas intensities, of the extraction and production of bitumen over time.

Education

Stanford University Palo Alto, CA
M. S. Energy Resources Engineering June 2015

Stanford University Palo Alto, CA
B. S. Energy Resources Engineering June 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*