

# Zach Ming

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

San Francisco, CA

Mr. Ming leads the development of energy models and communicates the findings on behalf of utilities, regulatory agencies, and trade groups. Since joining E3 in 2013, he has combined technical acumen with a talent for providing clear results that translate into action. Mr. Ming managed a recent study examining which resources will be needed to maintain resource adequacy in a future California electricity system that is deeply decarbonized and heavily dependent on renewable energy and electric energy storage to meet California's economy-wide 2050 greenhouse gas reduction goal. Other projects include modeling policy and technology-change scenarios to support utility strategic planning, calculating wind and solar contributions toward system capacity for multiple utilities, and constructing a model to evaluate the economics of rooftop solar policy in several states. Mr. Ming holds an M.S. in management science and engineering (energy and environment track) and a B.S. in civil and environmental engineering (atmosphere and energy) from Stanford University. Select projects at E3 include:

- Led development of a model to calculate the reliability of renewable + storage replacement of dispatchable natural gas generation for a large municipal utility
- Managed the cost-effectiveness analysis of a residential zero net energy policy in California
- Led an integrated resource study for a mid-size utility that was considering the decision to retire coal from their portfolio
- Modeled policy and technology-change scenarios for a large U.S utility as part of their strategy planning process
- Developed a model to evaluate potential changes to California rooftop solar policy and the resulting impact on both solar adoption and customer economics on behalf of the California Public Utilities Commission
- Calculated the optimal capacity planning reserve margin under a range of conditions on behalf of El Paso Electric utility
- Performed financial analysis on the impact of the renewable net energy metering program on behalf of multiple state utility commissions
- Developed testimony regarding rate design of natural gas pipelines and the implications to both producers and broader energy markets
- Studied the contribution of solar and wind resources toward system capacity for multiple utilities
- Studied the interactions and effects on the natural gas pipeline system in the western U.S. related to ongoing changes in the electric sector: namely the expansion of natural gas generating facilities and increased variability in gas generation due to increased renewable energy penetration

**GENERAL ELECTRIC**  
*Renewable Energy Development Program (REDP) Intern*

Schenectady, New York  
Summer 2012

- Developed new acceptance test for the WindBOOST product used by technicians in the field during product installation
- Created a long-term validation tool to ensure the WindBOOST product continues to perform as expected after installation

**CITIGROUP**

Houston, Texas

*Commodities Summer Analyst*

Summer 2011

- Modeled new EPA air pollution regulations (CSAPR) on the impact to coal and natural gas prices and power generation
- Developed pricing tool used by natural gas traders to compare historical basis spreads in the eastern U.S.
- Created an automated daily report on incremental gas production in the Marcellus Shale
- Analyzed weather vendor and in-house temperature predictions to increase accuracy of natural gas pricing models

**OGE ENERGY CORP (Enogex)**

Oklahoma City, Oklahoma

*Capacity Management Intern*

Summer 2010

- Managed natural gas interruptible transportation (IT) capacity on 2300 miles of pipe (full time position)
- Transacted and negotiated transportation and storage sales of 125+ million cubic feet of gas per day
- Conducted data research on developing unconventional supply areas near gas gathering assets

**MAP ROYALTY**

Oklahoma City, Oklahoma

*Engineering Intern*

Summer 2009

- Researched production data of horizontal gas drilling in the Granite Wash play in western Oklahoma and Texas panhandle
- Created geological and stratigraphic cross sectional maps through well log analysis to visually depict the new gas reserves
- Synthesized above findings in a report that aided company leadership in pricing and acquisition of mineral rights

Education

Stanford University

Stanford, California

*M.S., Management Science and Engineering (Energy and Environment)*

2013

Stanford University

Stanford, California

*B.S., Civil and Environmental Engineering (Atmosphere and Energy)*

2012

*Minor in Economics*

Citizenship

United States