

## The E3 Lab: Engineering, Economics & Environmental Decision Making

### Dr. Erin Baker

edbaker@ecs.umass.edu

<https://mie.umass.edu/faculty/erin-baker>

### Type of Research Position:

- Graduate RA at the PhD level
- Summer REU for undergraduates

### Description of Research Project:

We apply engineering methods to improve decision-making around energy and the environment. Some current students are working on projects related to the sustainability of the New England electric grid; equitable energy expansion strategies in Africa; the sustainability of Mexico's climate change goals; robust energy technology R&D portfolios; and engineering education in urban high schools.

This opportunity has some flexibility as to the topic. Some topics of potential interest include extensions to the topics mentioned above, as well as topics related to modeling and evaluating energy portfolios and infrastructure in Puerto Rico and US Virgin Islands, especially in response to the hurricane.

- **Interdisciplinary** - Students participate in the Wind Energy Fellows, a highly interdisciplinary group focused on the sustainable energy transition. We collaborate with environmental scientists, social scientists, and a range of engineers. We have worked with REU students from electrical, mechanical, and industrial engineering; and sustainability science.
- **Diversity welcoming/friendly research group:** I have graduated 5 PhD students and am currently mentoring 4. Three of my former students are in tenure track positions. I am committed to diversity: among my current and former PhD students, 2/3 are under-represented minorities and 1/3 are women.
- **International research opportunities:** Previous PhD students have had research internships in Finland and Italy. A current project involves networking with researchers and stakeholders in Ghana.

### Desired Qualifications and/or Background

In order to be successful in a graduate position a student should have very strong math skills; have an interest in applying quantitative modeling to grand challenges for the benefit of society; and be interested in a PhD in Industrial Engineering and Operations Research. Attractive, but not required would be some background knowledge of energy and/or economics; an interest in energy and the environment; a MS in math, engineering, or quantitative economics.

For REU students, we are looking for someone with an interest in applying quantitative modeling to grand challenges for the benefit of society.

