2010 Summer Internship Program at Energy and Environmental Economics, Inc. (E3)

E3 is a San Francisco-based economics and engineering consulting firm specializing in the electric power industry. E3's areas of expertise include transmission, rate design, integrated resource planning, energy efficiency, renewable energy, distributed generation, and climate change policy. For more information, see www.ethree.com.

The Summer Internship Program at E3 is designed to provide an opportunity for top graduate students to work on emerging energy topics alongside our staff of industry experts. Masters and Ph.D. candidates in science and engineering, economics, business, policy, and law are all encouraged to apply. The program is highly selective. Ideal candidates will combine enthusiasm for their topics, academic excellence, and relevant work experience.

Successful applicants may choose from a range of topics, and are expected to develop a stand-alone, publishable research product over the course of the summer. Interns will also contribute to active consulting engagements. The approach is designed to achieve the following:

- Provide students with the opportunity to work on their selected topics in a professional consulting atmosphere in which their research can be put into immediate practice;
- Provide students with an opportunity to develop a research 'deliverable' that they can use as the basis of future research, publications, and applications;
- Provide E3 an opportunity to work with top students who may be interested in consulting careers after graduation.

Application Process: Please send the following application materials in electronic form to recruiting@ethree.com no later than March 19, 2010:

- **Cover letter**
- **Resume**
- **One faculty reference (name/position, phone and email)**
- **Unofficial transcript**
- **Research proposal:**
  Review the list of selected topics (next page), and write no more than a page describing how you would approach the project you would like to spend the summer working on. The project proposal should give us an idea of what methodology and potential data sources you propose to use. The project proposal will be treated as a preliminary starting point and may change during the course of the internship based on feedback from E3. However, a strong internship application will provide enough detail to demonstrate that you have some grounding in your chosen topic area, and will give some indication of your analytical thought process.

Depending on the number of applications received, we will conduct either in-person or telephone interviews. Successful internship applicants will be notified by April 9, 2010 and two interns will be selected.

Stipend

Graduate student interns earn a stipend of $3,000 per month. Summer interns are not regular employees of E3.

E3 Location and Logistics
E3 is located in San Francisco's Financial District. Interns are expected to work during E3's regular business hours, which are 9am to 6pm.

Project List
The following projects relate directly to on-going research at E3, and we have a mentor available for each area. Research proposals should reflect one of these topics. Topics not on the list below may be considered if we receive exceptional proposals and can identify an E3 mentor to support the intern in developing the 'deliverable.' If you would like to propose a different topic, email a short description to recruiting@ethree.com to learn whether there is a fit.

Zero Net Energy buildings. California is pursuing a policy that all new residential and commercial buildings in the state be "Zero Net Energy" by 2020 and 2030, respectively. This project would analyze such questions as: What energy efficiency and self-generation measures will ZNE require in different building types and climate zones? What will be the load and generation profiles of ZNE buildings? What will ZNE buildings cost, both up-front and lifecycle, compared to conventional buildings? What are the key tradeoffs in ZNE building design? And crucially, what is the policy pathway required to achieve the ZNE objective?

Wind integration in Europe. The highest grid penetration of intermittent renewable resources occurs in northern European countries such as Denmark and Germany. This project would examine how these systems are performing, what changes in planning and operations have been required to integrate high levels of wind, and what the cost, emissions intensity, and policy implications have been. This project would characterize the lessons learned from the European wind experience and consider their applicability to the U.S.

The energy-water nexus. The relationship between water and energy use is of increasing concern to policy makers, as indicated by the inclusion of water efficiency in California's Title 24 building standards for the first time. Potential projects in this area include: quantifying marginal (as opposed to average) energy embedded in water delivery and use; replacement of generation capacity lost as once-through cooling is eliminated; mitigation of water use by solar thermal projects in dry environments; analysis of results from utility water efficiency pilot programs; and identifying untapped potential for demand response in the agricultural and water supply/treatment sectors.

Industrial electrification. E3's analysis of technology pathways to achieve deep GHG reductions by 2050 indicates the requirement for widespread electrification of existing fossil fuels uses, including in industrial processes. However, modeling the impacts of industrial sector electrification is hampered by a lack of information on technology options and costs. This project would research the technical feasibility and cost of displacing existing high-pressure, high-flow rate boilers with electric boilers, and/or other industrial electrification alternatives with a high potential for displacing GHG emissions.

Community energy. The traditional model for expanding energy efficiency and rooftop solar PV has focused on individual homes and businesses. This project explores how a community-based approach can lead to lower implementation costs and higher participation rates than the individual-oriented model. What financing models are the most effective and implementable? What policy and regulatory challenges need to be solved? Current community-based efforts to promote EE and PV include property assessed clean energy (PACE) financing under the CaliforniaFIRST program, and SMUD's Solar Shares program.

Demand-side forecasting. A critical component of utility resource planning is the load forecast, which is used to determine what new generation resources are required. Programs to reduce demand are often poorly represented in load forecasts, making them less accurate. This project aims to improve load forecasting through better estimates of the impacts of rate design, energy efficiency, demand response, distributed generation, and other demand-side programs.