

## **Group Project Proposal for the Donald Bren School of Environmental Science and Management**

1. **Title.** The Economics of Solar Energy: Developing a Green Certificate (REC) Market for the PVUSA Electricity Generating Facility in Davis, California
2. **Contact.** Joe Kastner, [jkastner@bren.ucsb.edu](mailto:jkastner@bren.ucsb.edu), 415.572.7825
3. **Bren Faculty Sponsor(s).** Charlie Kolstad, [kolstad@bren.ucsb.edu](mailto:kolstad@bren.ucsb.edu)
4. **Proposed Project**
  - A. *Problem Statement.* The PVUSA Facility located in Davis, California is an integral part of the national and international history of terrestrial solar photovoltaic (PV) applications. The site was originally conceived by PG&E as a research facility and, more recently, has been operated by the California Energy Commission. In the year 2000, the facility was purchased by the City of Davis and leased to Nuon Renewable Ventures USA, LLC (NRV) with the intention of upgrading the site and selling the electricity to the city and its residents. Due to changes in CPUC regulation during the energy crisis, NRV has been unable to fulfill this intention until the recent passage of legislation that allows Davis to purchase the brown power generated by the facility. The environmental attributes associated with the renewable energy generation, referred to as green certificates or RECs, must be sold separately from the brown power in order to make the project economically viable. The RECs were originally slated for export to European markets, however, recent events have made this transaction less desirable and thus a new solution must be found.
  - B. *Project Objectives.* Questions that need to be answered for this project include; Can a commercial Scale PV facility in CA be made economically effective through REC sales? Can a city-wide retail REC program be successful? What other markets are there for the REC's? How can the environmental attributes be quantified with respect to various pollutants? And a related question, what is the proper pollution baseline and how can it be accurately calculated? If a proper market(s) is identified, what is the potential for this market with respect to future PV projects in California and the western U.S.?

- C. *Project Significance.* Nuon Renewable Ventures USA, LLC is the client and is in the business of owning and operating commercial scale PV facilities. NRV has experienced success in three U.S. states with deregulated electricity markets. The successful identification of a mode for profitably selling the RECS produced at the PVUSA facility could lead to further investment in California and other regulated (or de facto regulated) markets.
  - D. *Background information.* The project is located in Davis, California. NRV's main office is in San Francisco. The problem evolved due to changes in the CPUC code after the energy crisis and the recent decision to not export the RECs to European markets. The facility is currently online and the city of Davis has been engaged with respect to a pilot program for marketing RECs to city residents via the municipal water utility.
  - E. *Stakeholders, other than the client.* The City of Davis and its residents. A successful program could lead to an expansion of solar PV in the city. The CEC has supplied a substantial grant for the recent installation of a new 180kW PV system. Other stakeholders include the California PV industry, contractors, suppliers, manufacturers, Pacific Gas & Electric, and developers.
  - F. *Possible approach and available data.* The group will be asked to develop a pilot program consisting of 25% (approximately 300,000 kWh) of the total REC output for marketing to Davis residents and businesses. In addition, the group should identify other possible markets and determine their potential in comparison to the pilot program. Finally, the group should determine the implications of lessons learned from the Davis application with respect to future commercial scale PV projects in California and the Western U.S.
  - G. *Deliverables.* NRV will expect a report detailing the results to date of the pilot program, the potential of other markets for selling the RECs, and recommendations for future PV projects with respect to REC sales.
  - H. *References.*
5. **Client.** Nuon Renewable Ventures USA, LLC. 448 Pennsylvania Ave, San Francisco, CA 94107. Matt Cheney, CEO. [Matt.cheney@nuonusa.com](mailto:Matt.cheney@nuonusa.com), 202.486.4500.

6. **Anticipated Financial Needs and Sources of Support.** NRV will supply funding for administration and overhead costs related to the development of the pilot program. A mobile phone or phone card will be provided for research needs and travel funds will be available for potential meetings in Davis and/or San Francisco. Support may also be considered for appropriate conferences in the western United States. NRV will offer one or more summer internships (paid) focusing on group project issues as well as other renewable energy related work in the San Francisco Office. NRV will also pursue internships on behalf of the students at the non-profit Center for Resource Solutions (CRS). CRS is located in San Francisco and oversees the Green-e REC verification program. Joe Kastner is an employee of NRV and a MESM student. He will serve as a company liaison and potential a group member depending on what the committee deems appropriate.

