

**Proposed Agreement between California Energy Commission
and
The Regents of the University of California, Advanced Power
and Energy Program**

Title: Energy, Air Quality, Water and Climate Change Co-Benefits of Renewable Generation and Fuels Roadmap
Amount: \$157,965.00
Term: 36 months
Contact: Marla Mueller
Committee Meeting: 1/18/2011

Funding

FY	Program	Area	Initiative	Budget	This Project	Remaining Balance	
09	Electric	EA	Terrestrial Resources	\$2,527,000	\$1,578	\$0	0%
09	Electric	EA	Air Quality	\$1,400,000	\$126,000	\$0	0%
09	Electric	EA	Global Climate Change	\$4,323,000	\$377	\$9,661	0%
09	Natural Gas	EA	Improve the understanding of and develop solutions to reduce impacts from NG	\$1,500,000	\$30,010	\$0	0%

Recommendation

Approve this agreement with Advanced Power and Energy Program - UC Irvine for \$157,965.00. Staff recommends placing this item on the discussion agenda of the Commission Business Meeting.

Issue

The variability of fuel cost and supply in California, coupled with the state's focus on energy conservation, reduction of greenhouse gases (GHG), and the Governor's expanded goal of 33% renewable energy by 2020, will result in large increases in the use of renewable generation and fuels throughout the state. Some of these alternative energy sources may be beneficial to air quality, some may not. Many times, however, emissions from the delivery pathway and from their use are not as well understood as for conventional fuels. There can be unforeseen drawbacks and benefits of switching fuels. There may be additional impacts and benefits from these fuel sources beyond air quality effects, such as reducing greenhouse gas emissions or conserving freshwater supplies. Since these impacts and co-benefits are not well understood, there is a need for additional research to inform decision makers of the consequences of these energy sources. To guide these research efforts, a roadmap that identifies knowledge gaps and research needs is needed. This specific focus is important to guide Public Interest Energy Research (PIER) Environmental Area research to help bring these resources to California in an environmentally sound way.

Background

California needs reliable, affordable, and clean supplies of energy to serve its citizens and maintain a strong economy. As California pursues its goal to address climate change by reducing greenhouse gas emissions, the driving force for the state's energy policies continues to be maintaining a reliable, efficient, and affordable energy system that minimizes the environmental impacts of energy production and use. Renewable energy is a key strategy for achieving greenhouse gas emission reductions from the electricity sector. (2009 IEPR)

In addition, there are several policies in place to expand the use of renewable fuels. For example, Senate Bill 1078 (Sher, Chapter 516, Statutes of 2002) established the Renewables Portfolio Standard (RPS) requiring 20% of retail sales to be from renewables by 2017. Governor Schwarzenegger's Executive Order S-14-08 expanded the goal to 33% renewables by 2020. In April 2006 Governor Schwarzenegger issued Executive Order S-06-06 to establish specific biomass production goals. It sets a target for biomass to comprise 20 % of the RPS for 2010 and 2020. The Order states that California shall produce a minimum of 20% of its biofuels within the state by 2010, 40 percent by 2020, and 75 percent by 2050.

One of the goals of the Public Interest Research Program as outlined in the Legislature in SB1250 is to develop and bring to market energy technologies that provide increased environmental benefit, specifically, through advanced electricity generation technologies that reduce the consumption of finite resources. SB 1250 also directs the Energy Commission to design a research program that "Emphasizes innovative energy supply and end use technologies focusing on their reliability, affordability, and environmental attributes."

California must bolster its current energy foundation with an aggressive and wide-ranging agenda that will continue to reduce energy demand, promote development of renewable energy resources, ensure development of cleaner fossil resources, give consumers more energy choices, and build the necessary infrastructure to protect the state from future supply disruptions and high prices (2009 IEPR).

However, California has some of the unhealthiest air in the nation and it is critically important that the use of new fuels does not adversely impact the States air quality and that the co-benefits of these fuels be identified. By understanding the potential impacts of renewable generation and fuels before they are in widespread use, policy makers and regulators can incorporate this knowledge into building an environmentally sound generation portfolio. This foresight may result in less environmental and economic burden through proper planning. A roadmap would help to ensure that the research is geared toward ensuring the finite resource of clean air is incorporated into future generation scenarios.

Proposed Work

The purpose of this project is to develop a roadmap identifying the state of knowledge, research gaps, and recommended research pathways to quantify the air quality benefits/disbenefits of renewable generation and of alternative fuels and the energy and environmental co-benefits of using these resources in California. This roadmap would complement the existing PIER-EA air quality suite of roadmaps on distributed generation, indoor air quality, energy efficiency and environmental justice. The roadmap would be designed to identify relevant research gaps and questions. Advisory Committee meetings and workshops would be held that would gather information for developing the roadmap, vet roadmap recommendations, as well as disseminate the conclusions of the roadmap.

Justification and Goals

This project "[will] advance energy science or technologies of value to California citizens..." (Public Resources Code 25620.(c)), and is part of a "full range of research, development, and demonstration activities that . . . are not adequately provided for by competitive and regulated markets (Public Resources Code 25620.1.(a)); and supports California's goal to after incorporating higher loading order resources, encourage the development of cost-effective, highly-efficient, and environmentally-sound supply resources to provide reliability and consistency with the State's energy priorities per the Energy Action Plan 2005.

This will be accomplished by:

- Identifying the state of knowledge, research gaps, and recommended research pathways to evaluate potential air quality impacts and energy, climate change and water co-benefits of the use of traditional, alternative and renewable fuels in California