



Caltech

February 25, 2010

CALIFORNIA INSTITUTE OF TECHNOLOGY
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Stephen L. Mayo

Vice Provost

Commissioners James D. Boyd and Anthony Eggert
Transportation Committee
The California Energy Commission
Dockets Office, MS-4

Re: Docket No. 09-ALT-1

1516 Ninth Street

Sacramento, CA 94814-5512

Attn: Leslie Baroody: 2010-2011 Investment Plan

DOCKET

09-ALT-1

DATE FEB 25 2010

RECD. FEB 25 2010

Dear Commissioners:

On behalf of the California Institute of Technology (Caltech) and in the long-term interests of the people of California, I am formally requesting your expeditious consideration of certification for Investment Plan funding eligibility for two California proposals in competition for the U.S. Department of Energy (DE-FOA-0000214) Fuels from Sunlight – Energy Innovation Hub award. The California Energy Commission Transportation Committee's certification of eligibility will provide an endorsement of both of these competing proposals and signal to Federal reviewers that the State is, at a minimum, at least as formally committed to supporting an Innovation Hub in California as other competing states are to their respective proposals. The DOE deadline for filing grant proposals, along with related support documents, is March 29, 2010.

Pursuant to Assembly Bill 118 (Nunez, Chapter 750, Statutes of 2007), the Alternative and Renewable Fuel and Vehicle Technology Program was created (amended by AB 109 – Nunez, Chapter 313, Statutes of 2008), and the Commission has initiated a program to advance the development and deployment of alternative and renewable fuels to keep pace with the State's climate change policies. The five-year duration of this \$20 million plus per year DOE Innovation Hub grant fits within the Program's seven-year goals of developing and improving alternative and renewable low-carbon fuel, producing such fuels in California, and decreasing the overall carbon footprint and increasing the sustainability of such fuels.

Specifically, the CEC is asked to qualify the following as eligible for funding consideration through the appropriate section of its Investment Plan program: "research and development of low-carbon fuels, including production of fuels directly from sunlight and including efforts in Department of Energy Innovation Hub focused on Fuels from Sunlight located fully in the State of California."

In the case of both proposals – the Joint Center for Artificial Photosynthesis (JCAP) and the Los Angeles Solar Refinery Hub – the objective is to enable and demonstrate a scalable solar fuel generation system that converts solar energy to liquid fuel with an improved efficiency of at least

an order of magnitude over currently employed technology. JCAP would be co-located at Caltech and at the Lawrence Berkeley National Laboratory, and it would include researchers from Stanford University and three University of California campuses: Santa Barbara, Irvine and San Diego. The Solar Refinery would be based in and supported by the City of Los Angeles, and it would be led by UCLA, with additional researchers from the University of Southern California and Caltech. As evidenced by the participation of four UC campuses and three independent research universities involved in both proposals, California's long-standing practice of forging synergistic public-private partnerships is at the heart of both proposals.

Both California proposals would leverage extant world-class expertise in photovoltaics, nanotechnology, CO₂ capture, catalysis and liquid fuel synthesis to develop the technology behind fuel production directly from sunlight.

The conversion of the largest energy source available to us, the sun, directly into chemical fuels fits perfectly with the State's and the Commission's initiatives and ongoing plans that will result not only in sustainable economic growth, but also in a cleaner environment through significant GHG reduction. Research and development of a technical approach to directly capture, convert and store solar energy in the form of chemical fuels will lead to development and construction of a proof-of-concept solar fuels generator. This effort will necessarily involve scientific discoveries and systems engineering breakthroughs that can produce a fully integrated production system. Production of low-carbon fuels is essential to meeting existing state regulatory fuels standards and to meeting future goals, such as the Governor's executive order regarding 80% reduction of CO₂ emissions by 2050. Low-carbon liquid fuels will be a critical capability to power aircraft, ships, heavy-duty vehicles, and other segments of the transportation market for which there are few technically credible alternatives to liquid hydrocarbons; they would also provide a technical approach to production of low-carbon fuels to meet the needs of light-duty vehicles. Direct production of such fuels from sunlight is one of the most promising approaches to meet this statewide goal.

The innovation hub concept was born in California through the genius of DOE Secretary Stephen Chu and his colleagues around the State. The awarding of the solar fuels hub here would place California and the State's business sector in an unparalleled position to exploit such technological developments, to transfer them to a revolutionary marketplace for storage and distributable clean fuel, and to reduce dependence on out-of-state sources of energy. Significant deployment in California of an innovation hub's technologies will be aided by the abundance of sunshine here, but it will be ensured by ongoing collaboration between leading academic researchers and a robust green technology industry – a partnership that will be further fueled by this DOE hub and CEC support.

Key members of both teams will undoubtedly welcome any inquiries about the details of their proposals, especially how key Investment Plan criteria for support would be met by either of the California proposals. Copies of the two proposals' Letters of Intention, filed with DOE, are available if additional background is needed for your deliberation.

Last month, Governor Schwarzenegger called on the State's "scientific and academic communities to tap their tremendous resources and put forward the strongest applications

possible for these [DOE hub] grants.” He concluded, “I look forward to supporting your ideas for innovation, and my administration stands ready to help.” The communities heard his call loudly and clearly, and we are responding affirmatively and strongly through these two proposals.

We appreciate your thoughtful consideration of this request and hope that you find it sufficiently compelling to enhance California’s competitiveness to win the DOE’s first solar fuels innovation hub award.

Sincerely,


Stephen L. Mayo

cc: Dr. Roberto Peccei, Vice Chancellor for Research, UCLA