NATIONAL FUEL CELL RESEARCH CENTER

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Date: March 3, 2015

Subject: Response to Call for Comments
EPIC Program
California Energy Commission

These comments are submitted in response to the following questions raised:

Discussion Topic #2: EPIC Investments and Research Centers

- Is there a need to target EPIC funds to research centers or multi-project awards? If so, describe why research centers or multi-project awards are needed and identify which topic areas they are needed in.

INTRODUCTION

Directing EPIC Program funds to a center focused on the development and deployment of fuel cell systems is both timely and appropriate – timely given the status of fuel cell technology, and the state of mobile and stationary fuel cell markets in California; appropriate given the role of fuel cell products in meeting the state's energy and environmental goals, and in stimulating California's economy.

Fuel cell technology and the entrance of fuel cell product into the stationary and mobile markets represents paradigm shifts in the manner by which (1) electricity is generated through distributed generation, (2) vehicles are powered on domestically sourced hydrogen, and (3) electricity is generated through next-generation 100MW-class central power plants.

California is uniquely positioned to leverage its early leadership in this arena into a global standard that supports California's goals for energy and the environment, and transforms the state's economy through the provision of clean, cost-effective power, a robust clean-energy industry, and jobs in manufacturing, sales, and service.

BACKGROUND

Stationary Fuel Cells. While stationary fuel cells became commercial in 1990, the market today is transitioning from a fledging introduction of the product to a mature commercial enterprise. It is also becoming apparent that stationary fuel cells are a cornerstone to supporting and facilitating distributed generation and the emerging penetration of renewable power generation. California leads the development of the national and world stationary fuel cell markets.

The California focus on renewable energy, on the reduction of greenhouse gas and criteria pollutant emissions, and on the reduction of water use accelerates the market for stationary fuel cells and associated opportunities such as: high-efficiency advanced 100MW class central plants; distributed generation; combined cooling, heat and power; management of power quality and intermittent renewables; distribution and utilization of direct current in buildings; ultra-high efficiency fuel cell/gas turbine hybrid power generation; and tri-generation of hydrogen and bio-hydrogen.

Mobile Fuel Cells. California also leads the development of the national and world markets for mobile fuel cells, with collaborating support from Japan and Germany. Field testing to facilitate the development and testing of prototype and commercially viable fuel cell electric vehicles (FCEVs) has been conducted in southern California over the past 15 years by the major vehicle manufacturers including General Motors, Toyota, Honda, Hyundai, Mercedes, Kia, and Nissan. Hyundai launched consumer availability of FCEVs in June 2014, and Toyota has announced the commercial retail of FCEVs in the fall of 2015.

The focus is now on hydrogen fueling infrastructure. California is the leader in national and international markets in the systematic deployment of infrastructure with a major public/private statewide initiative. The goal to enable the market for hydrogen fueling is supported by the initial commissioning of 68 stations, followed by the completion of more than 100 stations by 2020. The emphasis is on generating and distributing hydrogen with energy efficient and environmentally sensitive strategies, with particular attention to assuring that 33% or more of the hydrogen generated is renewable.

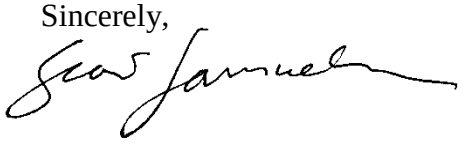
SUMMARY

Market, energy, and environmental forces are creating a unique and timely opportunity to capitalize on the attributes of both stationary and mobile fuel cell technology and product, and thereby secure California leadership and the opportunity to directly support the energy, environmental, economic, manufacturing, and job-creation goals of the State of California. Dedicating EPIC Program funds to support a center devoted to fuel cell technology will serve as a major resource for supporting and accelerating these opportunities.

As examples, the following achievements emanating from the National Fuel Cell Research Center (NFCRC), dedicated in 1998 by the California Energy Commission and the U.S. Department of Energy, illustrate the role, impact, and importance of a center focused on fuel cell technology:

- The formation of the California Stationary Fuel Cell Collaborative to support and facilitate the commercial market,
- The development of STREET to support and facilitate the deployment of hydrogen fueling infrastructure,
- The deployment of fuel cell electric vehicles (FCEVs) to corporations and city councils to familiarize the market and decision makers with this new paradigm,
- The conception and implementation of tri-generation technology for high-efficiency and environmentally sensitive generation of bio-hydrogen to power fuel cell electric vehicles, and
- The development of hybrid fuel cell/gas turbine electric power technology.

Sincerely,



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