UNIVERSITY OF HAWAI‘I SYSTEM

TESTIMONY

SB2271: Relating to Energy

Testimony Presented Before the Joint
Senate Committee on Commerce, Consumer Protection & Housing and
Energy, Environment and International Affairs

February 14, 2006

by

Dr. Richard Rocheleau
Director of the Hawaii Natural Energy Institute
University of Hawai‘i at Mānoa

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Chair English, Chair Menor, and Members of the Committees:

I am Dr. Richard Rocheleau, Director of the Hawaii Natural Energy Institute of the University of Hawai'i at Mānoa. HNEI was established by the Hawaii Legislature in 1974 to assist the state in developing Hawaii's renewable energy resources. HNEI is a research unit in the University of Hawaii's School of Ocean and Earth Science and Technology with staff of over 60 persons. Our research programs directly support many of the areas addressed in SB2271 including solid, liquid and gaseous fuels from biomass; hydrogen production from renewable resources; fuel cell development and testing; and the deployment and demonstration of renewable energy systems with an emphasis on hydrogen systems. HNEI's work also includes the development of thin-film photovoltaic cells, analysis of alternative fueled vehicles, and development of ocean resources.

HNEI has worked for over 20 years in the area of hydrogen and has developed a world-class capability. In 1996, HNEI was named a US Department of Energy Center of Excellence for Hydrogen Research and Education. In 2001, the legislature recognized the significance of hydrogen as a potential means of diversifying Hawaii's energy supply and funded a study through DBEDT conducted by HNEI to assess the potential of hydrogen and to develop a strategic plan for a state hydrogen program. Following this report, funds were allocated to support development of hydrogen-related research activities and to initiate development of industry partnerships. Interest and support in hydrogen and fuel cells accelerated as a national mission around 2003 with the Presidents announcements of *Hydrogen Fuel* and *Freedom Car Initiatives*. HNEI was and continues to be strategically placed to be a recipient of funding from several national programs.

In 2003, HNEI opened the Hawaii Fuel Cell Test Facility located in renovated warehouse space provided by HECO. This state-of-the-art facility houses test equipment and hydrogen infrastructure valued at more than $ 2.5 million. Testing and development efforts at this facility today are funded by the Office of Naval Research, by the US Department of Energy, and by industry. Teaming arrangements with industry include UTC Fuel Cells, General Motors, Ballard Power Systems, Arkema Inc, and should soon include Hoku Scientific. Funding for HNEI in this field today exceeds $ 3 million per year. The Hawaii hydrogen and fuel cell activities have helped to attract a major international conference to the Hawaii convention center scheduled for November 2006.

DBEDT and HNEI also successfully partnered to win a US DOE competitively awarded program called the Hawaii Hydrogen Power Park, to demonstrate hydrogen technologies

in a real-world environment. This project is being conducted at locations on Oahu and is expanding to the Big Island. A lease allowing HNEI to site hydrogen projects at the Hawaii Gateway Energy Center at NELHA has been approved by the AG's office and is expected to be signed very shortly. Other projects funded by US DOE include the renewable production of hydrogen from solar and biomass resources. Since 2000, DOE funding to HNEI in these areas has exceeded $ 6 million with more than $ 1.25 million more in non-federal cost matching. Partners in this cost match include DBEDT, City and County of Honolulu, HECO, HELCO, the Gas Company, Stuart Energy Systems (now Hydrogenics), MV Systems (a PV development company), Worldwide Energy LLC, and several universities. HNEI is also expecting to execute a subcontract to GE Global Research shortly to develop a "Hawaii Roadmap- Assessment of Electric and Transportation Infrastructure for the Big Island". Other hydrogen and fuel cell activities are taking place within the state at organizations such as Hoku Scientific and at the Hawaii Center for Advanced Transportation Technologies.

However, having world class facilities, a world-class team, and a strong industrial partnership is not enough. A basic fact of life in the federal R&D world is that there is a requirement for cost sharing of project dollars. This can range from 20 to 50% of a project's budget depending on the degree of risk in the research. While our industrial partners provide a significant contribution towards the cost share requirements and are expected to continue their support in the future, there is a limit to what they can support. Furthermore, other states are aggressively competing against Hawaii for these projects and several of them have established multi-million dollar funds to support efforts within their own states. Although many of these states are much larger and have significant funding, Hawaii does currently enjoy a leadership position in certain specialized areas that are appropriate for Hawaii particularly producing hydrogen using renewable resources such as biomass, wind, solar and geothermal. If we are to remain competitive in attracting federal research dollars, then we need the assistance provided for in SB2271.

As a final point, I would like to emphasize that achieving a hydrogen economy is not just about hydrogen. It is also about the renewable resources required to produce the hydrogen. Therefore, even if the hydrogen economy takes longer to develop than we might wish, the hydrogen program research effort laid out in this bill will help to develop our indigenous renewable energy resources such as biomass, wind, geothermal, and solar. By leveraging state dollars with federal dollars to advance renewable energy resources and hydrogen, Hawaii has the opportunity to become a leader not only in hydrogen but also in a variety of advanced renewable energy technologies.

HNEI therefore supports the provisions of SB2271 that provide incentives for the development of our indigenous renewable energy resources and in particular support a state hydrogen program as embodied in Part V of this bill.

HNEI also supports Sections 48 and 49 proposing to inventory state lands and identify parcels suitable for renewable energy development. We believe that it is necessary to approach renewable energy development from a sound base of land use policy; this bill will contribute to that goal. HNEI supports the appropriation of $150,000 to assist agricultural interests in developing energy projects based on the use of energy crops and agricultural waste streams with the requirement that these funds be used to leverage external funds from federal agencies and other sources.

Thank you for the opportunity to testify