

Testimony by the California Energy Commission Before the Senate Energy, Utilities and Communications Committee

MARCH 1, 2011

Thank you for this opportunity to address the Senate Energy Committee on the Public Interest Energy Research (PIER) Program. We are here today to answer the Committee's questions and to highlight the value of the PIER Program to Californians.

Since 1996, the Energy Commission has administered the Public Interest Energy Research Program, making funds available for research to advance our state's energy goals. If not reauthorized by the Legislature, this funding will sunset at the end of 2011.

**These are Tough
Economic Times**

First, I want to acknowledge the tough budget challenges before the legislature. Hard choices must be made to put the state's fiscal house in order. All government programs need to return exceptional value to our citizens. The Energy Commission takes its fiduciary responsibilities seriously.

In challenging economic times, we should also recognize that research, development, and demonstration (RD&D) is the engine that drives innovation and feeds economic recovery. Clean energy is a bright spot in the economy, and the PIER Program continues to support California's clean technology industry.

**PIER Delivers
Ratepayer Benefits:**

First, the PIER Program ensures that ratepayers are the primary beneficiary of all public research investments. Public research ensures all research results and information are transparent, open and coordinated which helps eliminate duplication and that all information and research results are publicly available.

Private companies invest in RD&D to increase profits for shareholders rather than the public and often cannot afford to invest in innovation when there is no certainty about the outcome.

Public research also ensures research priorities are aligned with state policy goals on energy efficiency, renewable energy and global climate change.

The leading focus is energy efficiency advancements — California citizens save money and the environment is improved.

PIER helps a transition away from fossil fuels to renewable sources.

Public research is a modest and worthy investment of state funds. Each year Californians spend \$29 billion on electricity, and it's important to continue researching and developing products and measures that can reduce a consumer's energy costs. The \$62.5 million per year for electricity research represents about 19 cents per month on the average electricity bill.

The PIER program has a successful track record of delivering benefits to California's electricity ratepayers. These were outlined in the June 15, 2010 response to the Committee's information request. Today I will highlight only a few examples.

New products have been developed and commercialized. Now available are wireless lighting controls for cost-effective building retrofits; improved water heaters; wireless heating, ventilation and air-conditioning thermostats; improved quality LED light fixtures; specialized controls for energy intensive data centers; radiant cooling designed for our hot, dry climates, and many more advanced technologies.

Efficiency standards remain the workhorse for our state's impressive efficiency savings. Five PIER funded research has been incorporated in recent building & appliance efficiency standards. These five measures alone will save a billion dollars a year when fully implemented. The bulk of these savings result from television standards and standards for external power supplies (powering devices like cell phones).

A dozen communities, from Humboldt County to San Diego, are showcasing renewable demonstrations. The projects integrate up to 100 percent indigenous renewable resources, along with storage, electric vehicles and demand response. Each project is testing various technologies and integration strategies to meet unique customer needs, at the lowest cost, without compromised reliability. These solutions allow more renewables that are closer to population centers, alleviating new transmission.

PIER funded PV advancements include residential and commercial roof integrated panels and lower cost tracker systems that are now commercially offered by SunPower, a California based company that accounts for 4 percent of the more than \$50 billion annual global solar PV market.

Integration solutions such as solar and wind forecasting, and integration of storage are allowing higher percentages of renewable energy supply to be deployed cost-effectively.

PIER addresses reliability challenges for the state's electricity grid.

Fostering R&D is good for business and positions California to lead the nation, and continue to export its clean energy products and expertise. Public Interest RD&D is good economic policy for tough times.

Response to the January 18, 2011 Legislative Analyst Office Letter on PIER

Upgrading the aging electric system is urgently needed to maintain reliability, and additional challenges are emerging with intermittent renewables and electrification of transportation. PIER, in partnership with the California Independent System Operator (CAISO) and industry, is developing the predictive and monitoring tools needed, as well as storage and demand response.

The CASIO is using synchrophaser data in a real-time display monitoring system to increase transmission reliability and prevent cascading outages. Estimated benefits from reduced outages are difficult to quantify but range upwards to \$300 million for California and close to \$1 billion for all of Western Electricity Coordinating Council. This is the culmination of a multi-year federal/state partnership that is now paying back big dividends.

- In the U.S., states with publicly funded public interest energy research agencies or laboratories attract **four times** as much clean technology venture capital funding as states without.

The PIER Program has effectively leveraged State dollars with federal and private investment dollars, providing additional economic stimulus. For example:

- In 2010, PIER reprioritized research to attract maximum federal dollars to California. As a result, \$21 million of ratepayer dollars leveraged \$500 million Federal ARRA funds, plus \$900 million private investment – a leverage of 70 to 1. This valuable leveraging of federal dollars would have been unlikely with a utility administrator.
- In the small grants program that targets small businesses and individual inventors, \$28 million PIER dollars led to \$1 billion in follow-on funding.
- These are not just dollars – they are jobs. Companies established; businesses expanding, and successfully selling products. Companies like Nano-solar; Primus Power and Dehlsen Associates have expanded in part due to PIER. One PIER grant recipient, CHA Corporation, relocated from Wyoming to California to field test and demonstrate its technology.

For today's hearing, we were asked to respond to the January 18, 2011, Legislative Analyst Office (LAO) Letter on PIER. The Energy Commission is pleased that the LAO agrees that funding public research is vital and must continue.

We, however, respectfully disagree with some of the conclusions and find that the LAO's analysis contains a number of inaccuracies. Specifically, the conclusion that there has not been a substantial payoff from the state's investment of \$700 million is unfounded. The cited example in the LAO letter incorrectly assumes that the Energy Commission claims energy efficiency benefits not related to PIER research.

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In fact, the Energy Commission has well documented five building and appliance efficiency measures, based on PIER research that will save Californians \$1 billion annually. This benefit is more than the \$700 million spent on the entire PIER program to date. The \$1 billion attributed to PIER is a small sliver of the \$64 billion achieved over three decades of efficiency standards.

The LAO report puts forward three options for administration of a public interest research program. The first option is to retain the program at Energy Commission with a few modifications. We recommend this option for these reasons:

1. The PIER program has delivered benefits
2. There's no substitute for public interest research
3. **Integration** will define the energy needs going forward.
4. We are committed to working with stakeholders to make improvements

The LAO report suggests that the PIER program should be more narrowly focused. The Energy Commission will redirect program focus based upon legislative direction and priorities, and will continue to incorporate the advice of the PIER Advisory Board, which the Legislature created.

Finally, we agree program improvements are necessary, including better communication on the importance of PIER and how this research benefits California ratepayers. We are listening to our stakeholders and we look forward to our continuing dialog with the Legislature.

A number of specific recommendations were made at the November 2010 meeting of the PIER Advisory Board. The Energy Commission is actively engaging this Board in making mid-course program improvements. These include strengthening our efforts to:

- Engage the PIER Advisory Board in approving an annual investment plan, consistent with a long term strategic vision.
Energy Commission will present investment plan to the Advisory Board in March 2011
- Identify and fund larger demonstration projects and transformative technology initiatives.
Energy Commission will roll out 3 new initiatives for discussion at March Advisory Board Mtg
- Coordinate research agenda with, agencies, utilities, the private sector, and research organizations.
On-going.

Although much has been accomplished, the State needs to continue to fund Public Investment in Research, Development and Demonstration (RD&D)

In conclusion, there is no substitute for Public Interest RD&D.

- Improve internal processes, including shorter contract timelines.
Initiated November 2010.
- Provide a quarterly notice of future upcoming grants and contracts that potential responders can use to plan their activities.
Completed February 2011.
- Conduct workshop on best practices in R&D cost/benefit analysis.
Planned May 2011.
- Initiate Strategic Planning to guide the next 5 year research plan.
Conversations Initiated and Solicitation Planned April 2011

Public investment in energy RD&D is critical to maintaining California's position as an energy technology innovator. The current investments are paltry next to the scale of our energy challenges.

- Bill Gates, the co-founder of Microsoft and a member of the American Energy Innovation Council, urges continued public investment in energy innovation as a matter of national policy.
- In an August 24, 2010, interview published in the Massachusetts Institute of Technology's *Technology Review*, Gates underscored the need for "energy miracles" for the U. S. remain on the cutting edge of technology innovation. Gates called for continuing investment in clean energy as a solution to a global energy problem, calling for a three-fold increase in U. S. investment in energy research, from \$5 billion to \$16 billion every year.

Both private and public investment in energy RD&D has declined significantly since the mid-1990s. Since that time private investment energy RD&D has dropped to unacceptably low levels.

- A National Science Board study concluded that energy sector RD&D funding remains very low in comparison to other sectors. U. S. energy companies invested only 0.23 percent of total revenues in RD&D in 2010. By contrast, companies engaging in pharmaceutical research investing 20 percent of revenue in RD&D; information technology, 15 percent; and semiconductors, 16 percent.

In summary, now is not the time to discontinue funding for state-sponsored energy research programs. The PIER Program funds high-priority projects that save energy, increase renewable energy supplies, address global climate change, and seek to resolve critical energy issues facing the electricity grid of the future. We look forward to working with the Senate Energy Committee to shape the PIER program for the next decade of energy challenges and opportunities.