



CALIFORNIA
ENERGY
COMMISSION

Semi-Annual Report
Concerning The
**Public Interest Energy
Research Program**

October 30, 2000 through May 31, 2001
Report to the Governor and Legislature

COMMITTEE REPORT

June 2001
P500-01-012v4



Gray Davis, Governor

June 1, 2001

Members of the Senate Energy, Utilities and Communications Committee
Members of the Senate Budget and Fiscal Review Committee
Members of the Senate Appropriations Committee
Members of the Assembly Utilities and Commerce Committee
Members of the Assembly Budget Committee
Members of the Assembly Appropriations Committee
California State Capitol Building
Sacramento, California 95814

**Re: *California Energy Commission's Semi-annual Report Concerning
The Public Interest Energy Research (PIER) Program***

Dear Members:

In accordance with Public Resources Code Section 25620.5(h), the California Energy Commission hereby transmits its Semi-annual Report regarding the Public Interest Energy Research (PIER) Program for the period November 1, 2000 through April 30, 2001. The enclosed report provides the required evaluation of the progress and a status of the PIER Program's implementation for this reporting period.

The Energy Commission is continuing to make substantial progress in meeting the goals of the PIER Program, as demonstrated by the results of PIER-funded projects that will advance science and technology to improve the quality of life for California citizens. Should you have questions or comments concerning this report, please feel free to contact Tim Schmelzer, Assistant Director in the Commission's Office of Governmental Affairs, at (916) 654-4942.

Respectfully submitted,

ARTHUR H. ROSENFELD
Commissioner and Presiding Member
Research, Development and
Demonstration Committee

ROBERT A. LAURIE
Commissioner and Associate Member
Research, Development and
Demonstration Committee

Enclosure
cc: Legislative Analyst's Office

California Energy Commission's Semi-Annual Report Concerning the Public Interest Energy Research Program (November 1, 2000, through April 30, 2001)

In accordance with Public Resources Code (PRC) Section 25620.5(h), this document constitutes the California Energy Commission's *Semi-Annual Report* for the Public Interest Energy Research (PIER) Program, covering the period from November 1, 2000, through April 30, 2001. (The Legislative Analyst has requested that all PIER Program semi-annual reports be submitted on or before June 1 and December 1 of each year.)

This report provides the required "evaluation of the progress and a status of the PIER Program's implementation" for this six-month period. It also provides input for the Energy Commission's more detailed *Annual Report Concerning the Public Interest Energy Research Program* (hereafter referred to as *Annual PIER Report*) required pursuant to PRC Section 25620.8.

I. SUMMARY STATUS OF THE PIER PROGRAM

As specified in PRC Section 25620, the primary mission of the PIER Program is to "improve the quality of life of this State's citizens . . . [by funding] public interest energy research, development and demonstration [RD&D] projects that are not adequately provided for by competitive and regulated energy markets." The funds for this program, totaling approximately \$61.8 million annually, come from the electricity ratepayers of specified investor-owned utilities and are held in the PIER Program Trust Fund Account. The Commission's Research, Development and Demonstration (RD&D) Committee initially reviews any proposed activities related to the PIER Program, and all funding awards are approved by the full Commission.

During this reporting period, the PIER Program accomplished the following:

- The Commission approved and on March 1, 2001 forwarded to the Governor and the Legislature the *Five-Year Investment Plan, 2002 Through 2006, for the Public Interest Energy Research (PIER) Program*. The RD&D investment plan is a requirement of Senate Bill 1194 (Sher, Chapter 1050, Statutes of 2000) and Assembly Bill 995 (Wright, Chapter 1051, Statutes of 2000).
- The Renewable Energy program team released a solicitation on January 29, 2001 entitled, "Making Renewables Part of an Affordable And Diverse Electricity System." Eight programmatic proposals totaling nearly \$100 million were submitted on April 20, 2001 in response. The Commission anticipates providing nearly \$40 million to three contracts under this solicitation by June 30, 2001. Not only does this solicitation provide an important cornerstone in the development of affordable renewable energy for California, but it also exemplifies the PIER Program's ability to act promptly and effectively. PIER Renewables staff will have evaluated and scored the eight proposals containing

approximately 85 individual renewable projects and prepared three complete contract packages totaling \$40 million in less than 60 days.

- The Renewable Energy program team established the preliminary structure for two renewable energy consortia that will help the Commission better coordinate technology and market development of California's wind and biomass energy resources. The consortia are comprised of representatives from industry, academic institutions, federal government, environmental groups and other involved state government agencies.
- In April 2001, the Environmentally Preferred Advanced Generation (EPAG) program area team released a \$26 million solicitation for proposals for RD&D and testing focused on fuel cells, micro and small turbines (<20 MW), fuel cell or turbine hybrid systems, and related technologies.
- The EPAG team is leading a multi-state collaborative proposal to compete for DOE funding for development of fuel cells and microturbines.
- The EPAG team has formed an Advanced Reciprocating Internal Combustion Engines (ARICE) Collaborative to seek solutions for reducing emissions so that these generator sets can be used for reliable, cheap, energy-efficient, and environmentally clean distributed generation in California.
- The Buildings Energy Efficiency program team awarded three programmatic contracts totaling approximately \$2.7 million targeted at advanced water heating systems, low income housing energy efficiency, and the development of new profit incentives for energy efficiency in the residential buildings sector.
- The Industrial/Agricultural/Water Energy Efficiency program team completed an analysis study, awarded two contracts, and contacted a select group of California-based energy intensive industries to assess their energy needs and develop a tailored research program for each industry.
- The Energy Related Environmental Research program team worked extensively with the University of California to finalize a research plan that identifies high-priority research issues in the PIER Environmental program area.
- The Strategic Energy Research Program team awarded two contracts and a grant totaling \$3,517,615 and initiated two tailored collaboratives with the Electric Power Research Institute (EPRI).
- The Energy Innovations and Small Grants Program released two new solicitations. The Commission approved 15 projects totaling \$1,115,509.

Further details concerning the Energy Commission's PIER Program activities for this reporting period are provided in Section II.

II. PIER PROGRAM AREA FUNDING STATUS REPORT

A. Renewable Energy Technologies

1. Renewable Energy Programmatic Solicitation

During this reporting period, the PIER Renewable Energy Technology team evaluated and finalized an EPRI draft analysis on the renewable energy technology market and associated benefits. Based on those evaluations and discussions with stakeholders, the team developed a programmatic solicitation focused on making renewable energy part of an affordable and diverse electricity market. The intent of the solicitation is to encourage electricity suppliers to partner with renewable energy technology developers to produce renewable technologies that provide high value to electricity users in California. The solicitation will award up to \$40 million over a three-year timeframe to three projects. Target groups include ratepayers with few existing alternatives for controlling their electricity use (e.g., residential and small commercial customers) who reside in high rate electricity service regions (e.g., San Diego, the Bay Area, Los Angeles region, etc.).

2. Renewable Energy Consortia

PIER Renewables staff has also been developing renewable energy consortia that will help coordinate future development of California's renewable energy resources, and provide the Commission with ready access to renewable energy expertise. A wind energy consortium and a biomass energy consortium have been developed to date. The consortia are comprised of representatives from industry, academic institutions, federal government, environmental groups and other involved state government agencies.

The California Wind Energy Consortium will provide the Commission access to a variety of wind energy experts and provide a forum for coordination of wind development efforts important to California. Products expected from the wind consortium include maintaining a California Wind Performance Reporting System (WPRS), California wind energy trend analyses, training classes for California wind energy operators, white papers identifying ways for wind energy to help provide benefits to California's electricity system, and a wind anemometer loan program. The University of California at Davis (UCD) will be acting as the administrator of the consortium. Similarly, UCD will be acting as administrator of a California Biomass Energy Consortium.

Like the wind consortium, the biomass energy consortium will provide such products as a biomass facilities reporting system, up-to-date biomass resource assessments for California, development of biomass standards specific to California's needs and white papers on ways for biomass energy systems to provide high levels of benefits to California's electricity system and environment.

3. Renewable Energy Planning Efforts

PIER Renewables staff has also been working with representatives from the Wind Turbine Company (WTC) and the Los Angeles Department of Water and Power (LADWP) to develop a follow-up project to WTC's advanced lower-cost wind turbine. Based on funding support provided by the Department of Energy, the National Renewable Energy Laboratory (NREL), and PIER, WTC successfully developed and tested a 250-kilowatt prototype wind turbine at NREL's National Wind Test Center. As a result of the successful 250 kW testing, WTC entered into negotiations with LADWP to test a 500-kilowatt turbine within LADWP's territory. The Fairmont Reservoir site was selected and preliminary agreements reached between LADWP and WTC. PIER renewables staff has been preparing a \$1.3 million contract with WTC to support testing of the 500-kilowatt system at the Fairmont site. The project represents a necessary and important step in operating the larger-scale turbine in a commercial setting that is representative of California's wind resources.

During this reporting period, EPRI provided two reports to the PIER Renewables team as part of an agreement between the agencies. In particular, EPRI provided a Technology Assessment Guide for Renewable Energy (TAG-RE). TAG-RE provides up-to-date, technology specific information on the environmental and economic characteristics of renewable energy technologies, and roadmaps for each of the treated renewable energy technologies.

EPRI also provided a report that assesses the market conditions and outlook for renewable energy technology developers operating in California and the potential benefits that could result from development of advanced technologies. The PIER renewable energy team has used the EPRI reports to update research plans in each of the major technology areas (wind, solar, geothermal, biomass). These plans are currently being reviewed and will form the basis for future directions in the Renewable Energy program area.

B. Environmentally-Preferred Advanced Generation

1. Solicitation for Fuel Cells, Micro/Small Turbines, and Hybrids

In April 2001, the EPAG team released a solicitation for proposals for RD&D and testing focused on fuel cells, micro and small turbines (<20 MW), fuel cell or turbine hybrid systems, and related technologies. The solicitation is for \$26 million with a maximum of \$3 million per project. Proposals are due in mid-June 2001, with the anticipated contract start dates in November 2001. For the targeted technologies, objectives are to:

- lower capital cost, installation cost, and/or operation and maintenance cost;
- improve fuel-to-electricity conversion efficiency;
- meet or exceed California atmospheric emissions requirements; produce other desirable environmental attributes;
- enhance reliability, durability and maintainability; develop multi-fuel use capabilities; support integration of distributed generation and on-site generation with the power grid; and

- lead to the adoption and use of the improved EPAG technologies within California.

The deployment of EPAG technologies will provide greater flexibility and control in the delivery of electricity, heat, and shaft power to industrial, commercial, and residential operations. Current predictions are that as much as 20 percent of new electricity generation capacity through the year 2020 will be in the form of distributed, on-site generation.

2. DOE-Funding Initiative

The EPAG team is leading an effort to compete for U.S. DOE funding for development of standardized testing protocols for microturbine generators and other distributed generation systems. \$Six million are available with up to \$one million in federal funding per award for states collaborating on advanced energy research. Partners with California include New York, Illinois, South Carolina, and North Carolina, as well as several national laboratories and universities.

3. New contract For Ultra-Low Emissions Turbine Technology

Alzeta Corporation of Santa Clara was awarded a new PIER contract (\$1.3 million) to conduct continuing research in the area of ultra-low polluting combustion techniques for natural gas. The work is targeted at high temperature and high pressure conditions typical of combustion turbine operation. When successfully commercialized, the Alzeta technology will enable very low cost control of nitrous oxide (NO_x) emissions without the use of presently required, costly exhaust clean-up systems. The technology is applicable to natural gas-fired combustion turbines that are widely used for generating electricity.

4. Advanced Reciprocating Internal Combustion Engines (ARICE) Collaborative

California's electricity supply shortages could partly be avoided by using generator sets powered by reciprocating internal combustion engines, but environmental concerns limit their use. The EPAG team has formed an Advanced Reciprocating Internal Combustion Engines (ARICE) Collaborative to seek solutions for reducing emissions so that these gensets can be used for reliable, cheap, energy-efficient, and environmentally clean distributed generation. This Collaborative will accomplish the following:

1. facilitate the research, development, demonstration and commercialization of ARICE technologies by funding projects in partnership with stakeholders;
2. coordinate with CARB to implement an inter-departmental policy for the utilization of efficient, clean ARICE technologies in distributed generation, emergency power, and other stationary applications; and
3. work with utilities and regulators to adopt policies that encourage the use of ARICE systems for power generation in appropriate applications.

The Commission is working with major public and private stakeholders to develop an action plan. A public-private workshop is planned for July 2001. A request for proposal will be

released in the summer leading to project proposals in November 2001. Contracts should be awarded by January 2002.

C. Buildings End-Use Energy Efficiency

1. Programmatic Energy Efficiency Awards

During the second half of 2000, the Buildings Efficiency Program Area team released a \$three million programmatic solicitation targeted at the residential buildings sector. As a result of this solicitation, the Commission has awarded three contracts totaling approximately \$2.7 million. These contracts are summarized below:

- Synergistic Energy Efficient Water Heating and Distribution Technologies

This PIER-funded program, conducted by the Davis Energy Group, will develop technologies and analyze systems that generate and deliver hot water for both domestic and space heating uses. Technologies to be advanced include a combined refrigerator/water heater, a condensate recovery system for a heat pump water heater, and a hydronic radiant distribution system. The energy performance of alternative hot water distribution systems will be evaluated, and their market barriers identified.

- Energy Efficiency for Low-Income Households

This PIER-funded program, conducted by ADM Associates, involves research efforts aimed at reducing energy costs and improving the indoor air quality (IAQ) of low-income households. The technologies and/or strategies to be investigated will be demonstrated within Habitat for Humanity housing in California. The areas of research include non-mechanical attic ventilation, attic heat recovery for hot water pre-heating, ducts in conditioned spaces, improvement of IAQ, effective HVAC controls, whole house fans and evaporative cooling, and the energy effects of community design.

- Energy Efficiency For Profitability, Quality, and Risk Reduction

This PIER-funded program, conducted by the Building Industry Institute, seeks to develop new profit incentives that will motivate builders to construct new homes that are energy efficient, comfortable and of high quality. The basis of these profit incentives will be reduced warranty costs, increased sales through new mortgage products, and increased builder and consumer value of energy efficiency through its association with comfort and quality. The research products will include a warranty call back analysis, improved construction protocols, a quality and comfort home rating system, mortgage guidelines, updates to the Air Conditioning Contractors of America design tools, and market research on how home rating systems impact new home buying decisions.

2. Cool Roof Strategies

In addition, the buildings team is funding the evaluation of cool roof strategies in support of the cool roof implementation program administered as part of California's peak load reduction program. This research is funded at \$300,000 and will be completed in 2002.

D. Industrial/Agricultural/Water Energy Efficiency

During this reporting period, the Industrial/Agricultural/Water Energy Efficiency group has undertaken the following projects.

1. IAW Energy Efficiency Contracts

The *Hydrogen Pinch Analysis Study* that researched the possibility of reducing energy use in California oil refineries was completed. The research allowed for optimizing the use of hydrogen that is commonly used in refineries, which potentially reduces the use of electricity and natural gas. The workshop was conducted in the Long Beach area so that the technology could be transferred to other refineries.

Several EPRI Targets and Technical Collaborations were evaluated. Four were selected in the area of power quality that helps industrial customers understand and overcome power quality problems.

R&D was completed for a California food processor to use new membrane technology to potentially reduce water use by 80 percent, with a possible savings of 240kW. This technology is very likely to be implemented by the industrial user in the near future, thus reducing electrical demand in the San Jose area.

A major contract with the Metropolitan Water District was begun which will develop and demonstrate various technologies that allow for energy efficient water treatment. Water treatment in southern California is energy intensive because water either has to be transported from northern California, or the locally available water and Colorado River water must be treated because it is very saline and brackish.

A contract with the California Cast Metal Association was initiated to research and recommend alternate operating procedures for its foundries. Metal foundries in California typically use electric furnaces ranging in size from one-half megawatt to 10 megawatts. The increase in electric prices and reliability has severely affected the industry. The research would possibly allow for load reduction and load shifting that will minimize the impact of blackouts, brownouts and higher rates. The contract was approved by the Commission at the May 30, 2001 Business Meeting.

A contract was awarded to Contra Costa Water District in collaboration with American Water Works Research Association. The research will assess pre-oxidation of the Bay Area water to reduce energy use and remove harmful byproducts caused by the current process. When implemented, the facility will save about 400 kW. If adopted by all 33 water district sites in

California, these techniques could reduce their electrical load by 11 MW. The contract was approved by the Commission at the May 30, 2001 Business Meeting.

2. IAW Energy Efficiency Collaborative Efforts

The IAW team contacted a select group of California-based, energy intensive industries to assess their energy needs and develop a tailored research program for each industry. Specifically, the plan is to have a formal technology development road map in consultation with the selected industries. This approach, in conjunction with other activities, would ensure an R&D program that is more responsive to industry needs. Thus far, the staff has contacted and held initial meetings with the electronics/computer industry and petroleum refineries.

E. Energy Related Environmental Research

1. Environmental Research Funding Efforts

Several environmental research projects were approved because of their immediate need during the last six months. The following are some highlights of the research activities newly initiated or being conducted in the environmental research area:

A Fine and Ultrafine Particulate Matter Study was initiated to develop a more accurate and precise particulate matter (PM) reference test method for measuring PM emissions from stationary sources. The funding level is \$725,000.

A project was initiated to assess the feasibility of using spray enhancement to reduce efficiency losses from dry cooling. Because this technology uses a small amount of water spray in the inlet air stream to the cooling tower where it evaporates and cools the air, the generation capacity of a power plant using dry cooling could improve by 7-15%. If this technology proves successful, it could reduce concerns for system reliability and substantial revenue losses associated with dry cooling. The use of dry cooling may then become an increasingly preferred alternative to wet cooling and in turn significantly reduce water use (dry cooling plants use up to 85% less water than wet cooling plants) and improve generation capacity. The funding level is \$285,000.

Efforts were undertaken to expand the *Central California Ozone Study*; a \$3 million research project designed to gain a better understanding of the dynamics of the existing and expected ozone problems in central California. The Energy Commission, CARB staff, and other representatives from the study's Policy Committee went to Washington D.C. to request funding and support from federal agencies to expand the data analysis part of this study. The representatives of these agencies were receptive to the continuation of the project and it is anticipated that these efforts will result in increased funding for the project.

The Energy-related Environmental Research team is making a major effort to help find ways to increase electricity supply while minimizing associated environmental impacts. A statewide “Back-up Generator” database is nearly complete. The next phase of this project will study the environmental implications of their use in the event of severe electricity supply shortages this and next summer, as well as alternative environmental dispatch mechanisms that can be used to minimize air quality impacts, while averting or reducing the severity of anticipated rolling blackouts.

2. Environmental Research Planning Activities

During this reporting period the Energy-related Environmental Research team worked extensively with the University of California to finalize a research plan that identifies high-priority research issues in four subject areas – air quality, aquatic resources, land-use and habitat, and global climate change – in the PIER Environmental program area. The draft research plan was sent to outside stakeholders and technical experts for review. The comments and recommendations from the 66 reviewers were incorporated and/or addressed in the final research plan, which will be available on the Commissions web site in the near future. The staff is now preparing detailed roadmaps to direct research in the eleven high-priority issue areas.

F. Strategic Energy Research

1. Strategic Energy Research Contracts

During this reporting period, the Strategic Energy Research program area team has undertaken the following RD&D projects:

- W.Brandt Goldsworthy & Associates project
- University of California Energy Institute research project
- The Valley Group project
- EPRI Collaborative projects

In November 2000, the Commission awarded a \$1,100,479 contract to W. Brandt Goldsworthy & Associates, Inc. to develop a composite reinforced aluminum conductor for transmission lines. This project will continue research begun under PIER contract number 500-98-035 with the same contractor. Under this first PIER contract, the contractor successfully completed a \$75,000 research effort to determine the feasibility of using a composite reinforced aluminum conductor (CRAC-TelePower) in applications dominated by the standard steel reinforced aluminum conductor known in the industry as DRAKE conductor.

This follow-on research contract will develop prototype-manufacturing technology for CRAC and demonstrate the conductor’s performance on a 2,000-foot (nominal) 3-phase span using Southern California Edison’s facilities. The new conductor has advantages of higher amp loading for the same cost as DRAKE, and the potential for carrying digital and analog signals for communications and conductor diagnostic purposes. This second project will improve the

reliability and capability of California's transmission and distribution system by developing a stronger and lighter conductor to replace California's aging and overloaded power lines.

In December 2000, the Commission awarded a \$2,050,000 grant to the University of California Energy Institute to fund a center to conduct academic research into the performance and design of electricity markets. Research topics will include the reliability and adequacy of electricity supply, demand-side price response, market design and efficiency, and market power mitigation tools. Work will begin in the spring of 2001.

In February 2001, the Commission approved a \$367,136 sole-source contract award with The Valley Group, continuing research begun under PIER contract number 500-97-011. Under the first PIER contract, the contractor (San Diego Gas and Electric Company in concert with The Valley Group) successfully completed a \$110,000 research effort to demonstrate the feasibility of implementing real time transmission line ratings for a single site in San Diego. The results showed that at the tested location, real time ratings indicated much higher power transfer capabilities than static ratings.

This follow-on research contract will demonstrate the feasibility of implementing real time transmission line ratings for Path 15, which is one of the most complex gates in the California transmission system. The real time ratings for Path 15 may at times provide for significant increases in power transfer capability when compared to the static line ratings currently employed by the utilities and CAISO. This demonstration phase is scheduled to be operational by June 2001 and could contribute to the summer 2001 preparedness activities by the state. Additionally, analysis on the applicability to other transmission paths will help California prepare for summer peak conditions.

2. Strategic Energy Tailored Collaborations

In March 2001, the Commission initiated two tailored collaboratives with the Electric Power Research Institute (EPRI). The first is an assessment of the impacts of electric ground support equipment on airport power quality. The Commission allocated \$91,500, with a total project cost of \$243,000. It is co-funded by EPRI, the Infrastructure Working Group and the Airport Solution Target. This project will characterize the impacts on power quality at airports from the use of electric ground support equipment (GSE) and electro-technology. Results from the assessment will enable California agencies and airports to understand the impacts of using electro-technologies to comply with air quality standards on airport operations.

Airports are an important segment of California's energy economy that cuts across electricity use, system reliability, transportation and air quality issues. Ensuring that electric GSE help reduce airport emissions, without adversely affecting the electric distribution system's reliability and quality of supply, can help airports function unhindered by air quality considerations, and contribute to a healthy state economy.

The second tailored collaborative with EPRI is a project to develop substantial components of the Energy Commission's web page on Distributed Energy Resources (DER). The objective is to

provide current, reliable, and actionable information to assist policy makers, consumers and researchers evaluate and install distributed resources. The Commission is contributing \$160,157 of the total \$320,314 project cost. The information will be presented in a way that addresses the needs of consumers in California who may be interested in DER in their home or business. It will also provide salient information needed by policy makers regarding the opportunities, impacts and market potential for DER. Lastly, for the research community, it will be a central repository of recent technology developments.

III. PIER COLLABORATIVE RESEARCH FUNDING STATUS REPORT

In December 2000, the six PIER subject area teams selected 29 research targets with EPRI for \$2.15 million and seven with the Gas Technology Institute (GTI) for \$0.65 million. The Commission will participate in these collaborative projects as a member, sharing the costs and benefits with other organizations from around the United States. These research projects were approved by the R&D Committee in the first quarter of 2001 and were approved by the Commission in late May.

This collaborative funding with EPRI and GTI allows the Energy Commission to participate in guiding national RD&D activities in specified areas and will help to ensure that California continues to receive the benefits of these nationally funded RD&D efforts.

IV. PIER ENERGY INNOVATIONS SMALL GRANT FUNDING STATUS REPORT

Through the Energy Innovations Small Grant Program, the Energy Commission has released nine solicitations to date. For the first seven solicitations, the Energy Commission has approved 61 projects totaling over \$5.2 million. The current status of the PIER Small Grants Program is summarized in the following table:

Energy Innovations Small Grant Program Funding Summary					
Solicitation	Release Date	Due Date	Business Meeting Date	Grants Awarded	Funded
99-01	3/31/99	4/30/99	8/11/99	13	\$973,966
99-02	4/30/99	5/31/99	11/17/99	5	\$374,595
99-03	8/30/99	9/30/99	1/26/00	11	\$824,530
99-04	12/17/99	1/28/00	7/12/00	10	\$741,769
00-01	3/15/00	4/28/00	9/20/00	7	\$524,751
00-02	6/15/00	7/28/00	12/20/00	11	\$818,194
00-03	8/31/00	10/31/00	3/21/01	4	\$297,315
00-04	12/30/00	1/31/01	Pending		
01-01	3/2/01	4/30/01	Pending		

During this past reporting period, the Commission approved 15 small grants for a total of \$115,509, and additional grants from the two additional solicitations (conducted in December 2000 and March 2001) are awaiting Commission Approval.

V. OTHER PIER PROGRAM ACTIVITIES

A. PIER Five-Year Investment Plan

The Commission approved and on March 1 forwarded to the Governor and the Legislature the *Five-Year Investment Plan, 2002 Through 2006, for the Public Interest Energy Research (PIER) Program*. The *Plan* lists a portfolio of integrated RD&D strategies that will lead to solutions—developed through research, development and demonstration projects—to increase electricity supply, reduce demand, lower peak demand, improve reliability and power quality, improve the operation of the market, and protect and enhance the environment.

The *Plan* is a requirement of Senate Bill 1194 (Sher, Chapter 1050, Statutes of 2000) and Assembly Bill 995 (Wright, Chapter 1051, Statutes of 2000). In accord with recommendations made by the PIER Independent Review Panel, the *Plan* begins with the PIER Program's fundamental mission, an "operational" definition and related criteria for "public interest" research, and a guiding "vision" for California's energy future. Following a review of the California energy context, the *Plan* identifies four key energy problems facing Californians and RD&D strategies for attacking the problems. Specific activities under each strategy are selected to take advantage of related current state, federal, and private activities. PIER's RD&D activities to date are consistent with the strategies. A flexible five-year budget has been adopted to allow the Program to adapt to new opportunities in science and technology, as well as to changes in California's energy picture.

B. Technology and Information Transfer/Reporting Activities

Technology and information transfer is critical to the success of any RD&D effort. Accordingly, during the past reporting period the PIER Program has performed the following activities:

PIER is co-sponsoring and co-planning an Industry Growth Forum (IGF) with the National Renewable Energy Laboratory (NREL). The IGF is now scheduled for November 2001 in the Bay Area. This is the first IGF held in California and it will focus on California-based businesses and technologies. Venture capitalists and "angel investors" from throughout the country will serve as panelists for the IGF, which will also include several PIER-funded projects seeking capital funding. In addition, the PIER staff will evaluate projects for referral to an energy business incubator, which is also supported by PIER funds.

During this reporting period, the Energy Commission completed its third *Annual PIER Report* and delivered the report to the Legislature on March 31, 2001, as required by law. The *Annual PIER Report* provides detailed information all PIER activities that occurred during the 2000 calendar year.

During this reporting period, the Energy Commission also continued its collaborative efforts with Science Applications International Corporation (SAIC) to redesign the PIER Program Web Site. The PIER staff provided program information to SAIC for input into the new Web Site. The new PIER website is now under construction with a targeted public release date of July 1, 2001.

The PIER Program recently co-sponsored and participated in a number of technology transfer events:

- The staff participated in the partners meeting for the Center for the Built Environment.
- The staff attended the steering committee meeting for the Air Conditioning and Refrigeration Technology Institute.
- The staff presented a poster at the annual meeting of the West Coast Section, Air and Waste Management Association. The poster and paper highlighted a PIER project that may impact the siting of power plants in California.
- PIER cosponsored a workshop by the International Energy Agency U.S. DOE and CalSEIA that focused on the renaissance of solar photovoltaic energy in the United States.
- PIER will co-sponsor the University of California, Irvine International Colloquium and Exhibit on Environmentally Preferred Advanced Energy Generation May 21-25, 2001 in Newport Beach.
- PIER will co-sponsor UPEX '01, the annual conference of the Solar Electric Power Association from September 30-October 5, 2001 in Sacramento.
- The first IGF in California will focus on California-based businesses and technologies. It is scheduled for November 2001 in the Bay Area.

C. Independent Review Panel for PIER Evaluation

PRC section 25620.9(a) required the Energy Commission to designate an independent panel of experts by January 1, 1999 to conduct a comprehensive evaluation of the PIER Program. PRC Section 25620.9(b) required the Independent Review Panel to submit preliminary and final reports on its findings to the Legislature. The panel submitted its preliminary report during the first quarter of 2000 and submitted its final report March 2001. The panel held its last meeting in February 2001 to adopt its final report. The final report offered a set of expectations of what the Governor, the Legislature, and the Energy Commission must accomplish over the next year to transform PIER into a high-quality research program within the Energy Commission.

D. Transition Funding Status Report

In 1998, the Energy Commission awarded approximately \$17 million to 39 separate "transition" projects covering the six PIER program areas. Of the 39 transition projects, 37 have been completed, and one was cancelled as of the end of the fourth quarter of 1999.

During this reporting period, the final report on the last transition project was received. The report will be completed by the end of June 2001. The Commission has also produced a CD-ROM that includes 41 PIER project final reports, 37 of which are transition projects.

E. The Renewables Geothermal Solicitation

The PIER Program has joined with the Geothermal Resources Development Account Program to release a solicitation for the funding of geothermal energy research, development and demonstration.

The PIER program funds can only be used for energy RD&D projects that benefit California ratepayers and address a significant California energy problem not adequately provided for by competitive and regulated markets. In addition, PIER funded projects must also provide benefits to electricity-related RD&D activities. RD&D efforts which benefit other types of energy users can qualify for PIER funding if projects also provide benefits to electricity ratepayers.

Of the up to \$4.7 million available to fund geothermal research, development, demonstration, commercialization, environmental enhancement, mitigation or planning projects, approximately \$2 million will be for PIER grants and up to \$2.7 million will be for GRDA grants or loans. Final applications were due by May 16, 2001. The Notice of Proposed Awards will be released on June 15, 2001, and contracts should begin in August 2001.

VI. CONCLUSION

The Energy Commission remains fully committed to administering the PIER Program in an efficient and effective manner that ensures public input and accountability. The PIER section of the Energy Commission's Web Site is a means of communicating with stakeholders and the public. The website and all reports can be accessed at:

<www.energy.ca.gov/research/PIER/index.html>
