

# Energy Efficiency and Alternative Energy Programs

MAC TAYLOR • LEGISLATIVE ANALYST • DECEMBER 19, 2012

## Summary

California currently maintains over a dozen major programs that are intended to support the development of energy efficiency and alternative energy in the state. Over the past 10 to 15 years, the state has spent a combined total of roughly \$15 billion on such efforts, the vast majority of which has been funded by utility ratepayers. The state's incentive programs generally fall into one of the four following categories: (1) energy efficiency programs, (2) renewable energy programs, (3) alternative transportation and low-carbon fuels programs, and (4) energy research programs. In response to the *Supplemental Report of the 2012-13 Budget Package*, this report provides an overview of these different programs, as well as a preliminary assessment of them in terms of priority, overlap, and redundancy.

Our review and preliminary assessment of the state's major energy incentive programs finds that the state currently lacks a comprehensive framework that fully coordinates these activities to help ensure that the state's goals are being achieved in the most cost-effective manner. The absence of such a comprehensive framework (1) results in some level of program duplication, (2) results in some departments making policy choices that may not be aligned to legislative priorities, and (3) makes it difficult to compare effectiveness across programs.

In view of the above, we recommend that the Legislature develop a comprehensive strategy for meeting the state's energy efficiency and alternative energy objectives. In general, the comprehensive strategy should specify (1) the state's energy efficiency and alternative energy goals, (2) how programs should fit together to achieve the state's goals, and (3) how program effectiveness will be measured. Such a strategy will be particularly important as the Legislature decides how to effectively invest the revenues generated from the state's cap-and-trade auctions and the recent passage of Proposition 39.

AN LAO REPORT

## INTRODUCTION

California currently maintains over a dozen major programs that are intended to support the development of energy efficiency and alternative energy in the state. Since each of these programs began—which in a few cases was as early as 1979—the state has spent a combined total of roughly \$15 billion on such efforts. For 2012-13, more than \$1 billion is estimated to be spent on the state’s energy efficiency and alternative energy programs. In addition, the revenues generated from the state’s “cap-and-trade” auctions and the recent passage of Proposition 39 will further increase the amount of funding to support such programs in the coming years. The various energy efficiency and alternative energy programs are administered by multiple state departments, including the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the Air Resources Board (ARB).

The *Supplemental Report of the 2012-13 Budget Package* directed our office to develop a report that (1) lists all programs and funding related to energy efficiency and alternative energy, and (2) provide a preliminary assessment of these programs in terms of priority, overlap, and redundancy. This report responds to this supplemental report language. In this report, we specifically discuss those state programs that provide funding to incentivize the development in energy efficiency and alternative energy. Thus, we have not included the state’s myriad regulations and standards associated with energy efficiency and alternative energy, as well as those programs administered by municipal and local government entities. We also identify a series of issues for legislative consideration in order to help the state more effectively meet its energy goals. In preparing this report, we consulted with various state departments and relied heavily upon the program data that they were able to provide us.

## BACKGROUND

### What Is Energy Efficiency and Alternative Energy?

**Energy Efficiency.** In general, energy efficiency refers to the installation of energy efficient technologies or measures that are designed to reduce energy usage and eliminate energy losses in homes and businesses. Thus, energy efficiency incentive programs aim to reduce energy usage while maintaining comparable service, thereby saving energy consumers money on their utility bills. An example of a common energy efficiency program is one that provides rebates to replace old, outdated appliances with newer, more energy

efficient appliances such as refrigerators, washers, and dryers. Consumers who use these more efficient products are able to get the same level of service while using less energy to do so.

**Alternative Energy.** In comparison, alternative energy refers to energy that comes from “renewable” sources—meaning sources that are not finite and do not use up natural resources like more traditional forms of energy that rely on fossil fuels. Such renewable sources include the sun, wind, and water. Renewable sources are generally considered to be cleaner and less polluting than traditional forms of energy.

## Energy Efficiency and Alternative Energy Development in California

California has a long and extensive history of pursuing energy efficiency and alternative energy development. In the wake of the Arab oil embargo of the early 1970s, the state passed the Warren-Alquist Act of 1974, which declared that overdependence on petroleum-based fuels is a threat to the state's energy security due to market and supply uncertainties. This act also declared that rapid growth of electricity demand could have negative environmental impacts. As such, the act also established the CEC to help the state reduce "wasteful, uneconomical, and unnecessary uses of energy in order to reduce the rate of growth of energy consumption and prudently conserve energy resources." From its inception, the CEC established building and appliance standards designed to reduce the state's long-term energy consumption.

As a result of the electricity crisis in 2000-01, the state refocused its efforts to meet a greater amount of the state's energy demand through efficiency and alternative energy sources. In 2003, the state adopted its first Energy Action Plan which described how the state should meet new energy

demand. Specifically, the plan indicated that the demand should be met based on a "loading order"—energy efficiency, then renewable resources, and lastly by cleaner, traditional sources of energy (such as natural gas). In order to help meet this goal and facilitate the development and adoption of energy efficiency and alternative energy, the state created additional incentive programs.

As we discuss below, these energy-related incentive programs generally have multiple goals. For example, some programs focus on achieving immediate and direct benefits, while other programs focus on what is commonly referred to as "market transformation"—a process of intervening in a market in order to bring about widespread, permanent change of that market. For example, such a program could attempt to facilitate a transformation of the state's vehicle fleet by bringing down the cost of hybrid and electric vehicles. Such a program would require subsidizing these types of vehicles in order to make them cost competitive with traditional vehicles. In the following section, we provide a detailed overview of the state's major energy efficiency and alternative energy programs.

## OVERVIEW OF MAJOR STATE ENERGY PROGRAMS

In general, the state's incentive programs fall into one of the four following categories: (1) energy efficiency programs, (2) renewable energy programs, (3) alternative transportation and low-carbon fuels programs, and (4) energy research programs. While these programs are supported from different funding sources, the vast majority of total spending is funded from utility ratepayers. In addition, as we discuss, some of these programs have been evaluated in terms of their cost-effectiveness at reducing energy demand.

Figure 1 summarizes the different programs, which we describe in more detail below. The figure indicates that a total of \$15 billion has been spent on these programs over the last 10 to 15 years.

### ENERGY EFFICIENCY PROGRAMS

As previously discussed, energy efficiency typically refers to the installation of energy efficient technologies or measures to reduce energy usage and eliminate energy losses. As indicated in Figure 1, a total of about \$9.5 billion has been

spent specifically on energy efficiency programs. Currently, the state has three major incentive programs related to energy efficiency.

**Investor-Owned Utility (IOU) Energy Efficiency Programs—CPUC**

*Purpose.* Public Utilities Code Section 454.5 requires utility companies to first meet their “unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible.” Over the

past several years, the CPUC has issued decisions aimed at creating a policy framework to expand the energy efficiency programs administered by the state’s IOUs—Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric.

For example, in 2008, the CPUC adopted a Long-Term Energy Efficiency Strategic Plan. In this plan, the commission established goals for achieving all cost-effective energy savings across all major sectors in California, as well as to compel sustained market transformation. As part of its plan, the

**Figure 1  
Major State Energy Efficiency and Alternative Energy Programs**

(In Thousands)

Category/Program	Department	2012-13	Cumulative Funding to Date
<b>Energy Efficiency</b>			
IOU Energy Efficiency Programs	CPUC	\$1,000,000	\$9,000,000
Energy Efficiency Financing Program	CEC	3,440	274,000
Federally Funded Energy Efficiency Programs	CEC	1,930	261,000
State Energy Program		(1,930)	(226,000)
Energy Efficiency Block Grants		—	(35,000)
<b>Totals</b>		<b>\$1,005,370</b>	<b>\$9,535,000</b>
<b>Renewable Energy</b>			
Public Interest Renewable Energy Program	CEC	—	\$1,564,000
Existing Renewable Facilities		—	(450,000)
Emerging Renewable Facilities		—	(513,000)
Consumer Education		—	(16,000)
New Renewable Resources		—	(585,000)
Go Solar California Program	CPUC/CEC	\$232,900	1,629,000
California Solar Initiative		(156,400)	(1,500,000)
New Solar Homes Partnership		(76,500)	(129,000)
Self Generation Incentive Program	CPUC	83,000	970,000
Clean Energy Upgrade Financing Program	CAEATFA	1,100	25,000
<b>Totals</b>		<b>\$317,000</b>	<b>\$4,188,000</b>
<b>Advanced Transportation and Low-Carbon Fuels</b>			
Alternative and Renewable Fuel and Vehicle Technology Program	CEC	\$122,320	\$378,000
Air Quality Improvement Program	ARB	28,000	109,000
Sales and Use Tax Exclusion (SB 71)	CAEATFA	100,000	196,000
<b>Totals</b>		<b>\$250,320</b>	<b>\$683,000</b>
<b>Energy Research</b>			
Public Interest Energy Research Program	CEC	\$44,500	\$556,000
<b>Grand Totals</b>		<b>\$1,617,190</b>	<b>\$14,962,000</b>

IOU = Investor-Owned Utility; CPUC = California Public Utilities Commission; CEC = California Energy Commission; CAEATFA = California Alternative Energy and Advanced Transportation Financing Authority; and ARB = Air Resources Board.

CPUC authorized a significant increase in funding for energy efficiency programs administered by the IOUs. Specifically, CPUC has overseen the development and implementation of programs in three-year cycles, such as rebate and incentive programs for residential, commercial, industrial, and agricultural energy users in order to encourage the purchase of energy-efficient appliances and equipment. These types of programs are intended to achieve both short- and long-term goals. For example, some of the programs seek to implement cost-effective energy efficiency measures that will have an immediate benefit. In comparison, some of the programs seek to achieve long-term market transformation. For example, the IOUs are currently implementing pilot programs to encourage the development of “zero net energy” buildings. A zero net energy building produces as much renewable energy on-site as it uses when measured over a given year. This is achieved through the use of advanced architectural design and construction techniques which are intended to minimize the building’s energy consumption. The long-term goal of the program is to transform how new buildings are designed and built, thus creating the potential for substantial energy savings in the long run.

**Funding.** As indicated in Figure 1, CPUC has authorized a total of about \$9 billion on IOU energy efficiency programs since they were initiated in 1998 and substantially expanded in 2006. As previously discussed, the majority of these funds have been provided over three-year funding cycles. In 2012-13, \$1 billion is estimated to be spent on such programs. Funding for these programs comes from electricity and natural gas rates that are collected from ratepayer utility bills, as well as a public goods charge that we discuss in detail below.

### **Energy Efficiency Financing Program—CEC**

**Purpose.** The Energy Efficiency Financing Program, which is administered by CEC, is a

low-interest loan program for public entities (such as cities, counties, public schools, special districts, and hospitals) to finance energy efficiency and energy generation projects. Specifically, the program provides a fixed interest rate of 1 percent for the term of the loan, which must be repaid within 15 years. The maximum loan amount is \$3 million. In order to be eligible for financing, an applicant must provide evidence that the proposed project will result in producing a greater benefit in terms of energy demand reduction than the project’s cost. In other words, there must be demonstrable net savings associated with the project. Approved projects have included lighting systems; light-emitting diode (LED) streetlights and traffic signals; energy management systems and equipment controls; building insulation; and heating, ventilation, and air conditioning equipment.

**Funding.** Funding for the Energy Efficiency Financing Program is provided from the Energy Efficiency Conservation Account, which was established in 1979. This account was initially supported by the state General Fund and later with federal funds from the American Recovery and Reinvestment Act (ARRA) of 2009. Since the program was initiated, a total of more than \$274 million has been provided to approximately 770 public entities. For 2012-13, the CEC estimates it will spend about \$3.4 million on the program.

### **Federally Funded Energy Efficiency Programs—CEC**

**Purpose.** Under ARRA, the state received a one-time influx of federal funds totaling \$314 million for energy efficiency related activities. These funds are used by CEC to support primarily two state energy efficiency programs—the State Energy Program and the Energy Efficiency Block Grant Program. The goals of these two programs include stimulating economic growth and job

creation, achieving measurable energy benefits, and helping to meet California’s energy and environmental goals.

- **State Energy Program.** The State Energy Program helps support existing residential and commercial building energy efficiency—as well as water efficiency—retrofits. Under a competitive application process, local government entities, nonprofit and for-profit organizations can apply for program funding based on the type of building that will be retrofitted. In addition, the program provides low-interest loans and grants to eligible private sector businesses that either (1) use biomass material to produce biomethane gas or (2) manufacture and/or assemble energy efficient or renewable energy products.
- **Energy Efficiency Block Grant Program.** The Energy Efficiency Block Grant Program provides funds to small cities, counties, and local government entities for various energy efficiency projects. Such projects include lighting retrofits, building upgrades, and mechanical equipment.

**Funding.** At this time, a total of \$226 million in ARRA funds has been appropriated for the State Energy Program and \$35 million on the Energy Efficiency Block Grant Program. For 2012-13, about \$1.9 million is estimated to be spent on the State Energy Program, but no funding is scheduled to be spent for the Energy Efficiency Block Grant. The remaining ARRA funds have been spent on relatively smaller programs.

**RENEWABLE ENERGY PROGRAMS**

As previously indicated, renewable or alternative energy refers to the use of renewable resources (such as wind and solar) to produce electricity. Under the state’s current Renewables

Portfolio Standard (RPS), California has the goal of increasing the percentage of renewable energy in the state’s electricity mix to 33 percent by 2020. To support this and other related renewable energy goals, the state has spent a total of about \$4.4 billion on various programs that seek to incentivize the production of renewable energy. Currently, the state administers four major incentive programs related to renewable energy.

**Public Interest Renewable Energy Program—CEC**

**Purpose.** The Electric Utility Industry Restructuring Act (Chapter 854, Statutes of 1996 [AB 1890, Brulte]), widely referred to as AB 1890, authorized, among other things, the Public Interest Renewable Energy Program to support the operation of existing renewable facilities as well as the development of new and emerging renewable technologies. Since its inception, the program, which is administered by CEC, has supported the following categories of renewable energy activities:

- **Existing Renewable Facilities.** The Public Interest Renewable Energy Program helps subsidize in-state energy production from existing renewable sources, in order to increase the competitiveness of these sources with that of natural gas-fired power plants. For example, a large majority of the funds have been used to support the state’s biomass power plants which, in general, would operate at a net loss without the subsidy.
- **Emerging Renewable Facilities.** The program also supports emerging renewable facilities, specifically, the development of a self-sustaining market for renewable energy technologies in distributed generation applications. For example, the program provides rebates to purchasers, lessors,

or sellers of eligible electricity generating systems for on-site generation. From 2007 through 2011, the program provided incentives for purchasing and installing small wind systems and fuel cells using a renewable fuel.

- **Consumer Education.** The program has also supported efforts to educate consumers, generate public interest about renewable energy resources, as well as build and maintain a market for renewable power through consumer education.
- **New Renewable Resources.** The Public Interest Renewable Energy Program has also sought to incentivize the building of renewable electricity generation projects in California. Initially, the program allocated funds to the lowest bidders during three competitive solicitation processes. Subsequently, financial production incentives (called supplemental energy payments) were offered through 2008 to cover the above-market costs of meeting the state’s RPS.

**Funding.** In order to fund the Public Interest Renewable Energy Program, AB 1890 authorized a temporary surcharge on IOU electricity bills. This surcharge is commonly referred to as a “public goods charge.” From 1998 through 2011, a total of about \$1.6 billion from this surcharge was spent on the Public Interest Renewable Energy Program. We note that the public goods charge was not reauthorized by the Legislature and, thus, funding for the program expired at the end of 2011. The Governor has directed the CPUC to continue collection of a similar surcharge (referred to as the “electric program investment charge”) in order to maintain funding for the Public Interest Renewable Energy Program.

### “Go Solar California” Program—CPUC and CEC

**Purpose.** In 2007, the state established a program known as Go Solar California. The goal of the program is to develop 3,000 megawatts (MW) of solar generating capacity by 2020. Specifically, the program consists of the following two components.

- **California Solar Initiative (CSI).** The CSI, which is administered by the CPUC, provides cash back for solar energy systems of less than 1 MW to existing and new commercial, industrial, government, nonprofit, and agricultural properties. In addition, CSI offers incentives based on the amount of natural gas or electricity displaced by solar water heating systems. These particular incentives are available for residential, multifamily, and commercial properties.
- **New Solar Homes Partnership (NSHP).** The NSHP, which is administered by CEC, offers incentives to builders of new residential construction to encourage them to include solar installations in IOU service areas.

**Funding.** The Go Solar California program is funded through utility rates. Since 2007, the program has provided a total of about \$1.6 billion in incentives—\$1.5 billion for CSI and \$129 million for NSHP.

### Self-Generation Incentive Program (SGIP)—CPUC

**Purpose.** Chapter 329, Statutes of 2000 (AB 970, Ducheny), established SGIP, which is administered by CPUC and offers up-front capital and performance-based incentives for qualifying distributed energy systems. Qualifying



technologies include wind turbines, waste heat to power technologies, internal combustion engines, gas turbines, fuel cells, and advanced energy storage systems. Currently, the program also focuses on greenhouse gas (GHG) reductions. Specifically, the CPUC, in consultation with ARB, is required to identify distributed energy resources that could help meet the state's GHG reduction goals.

**Funding.** The SGIP is currently funded from utility rates. Each year, \$83 million is collected to support the program. The CPUC has authorized this particular funding level through 2014. As indicated in Figure 1, since the establishment of the program, a total of roughly \$1 billion has been collected for SGIP.

#### **Clean Energy Upgrade Financing Program—California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA)**

**Purpose.** Chapter 9, Statutes of 2011 (ABX1 14, Skinner), established the Clean Energy Upgrade Financing Program, which provides up to \$25 million for CAEATFA to administer loan loss reserves for financial institutions that provide loans for energy improvements on residential properties. (The CAEATFA is an authority within the State Treasurer's Office.) By participating in the program, financial institutions receive an initial 15 percent reserve contribution for each qualified loan enrolled in the program. Under current law, the CAEATFA may provide up to 100 percent coverage on qualified loan defaults. The goal of the program is to increase access to retrofit financing.

**Funding.** Funds were initially derived from the public goods charge to support the Clean Energy Upgrade Financing Program through the Renewable Resource Trust Fund. To date, a total of \$25 million has been made available for this program.

#### **ADVANCED TRANSPORTATION AND LOW-CARBON FUELS**

The state also administers programs that are intended to expand the use of advanced transportation and low-carbon fuels. Advanced transportation refers to technologies, such as electric vehicles and ultralow emission vehicles, that reduce the use of energy. Low-carbon fuels are fuels that have a carbon intensity that is lower than traditional fuels and, thus, have lower emissions associated with their usage. As required under Chapter 371, Statutes of 2005 (AB 1007, Pavley), the CEC—in partnership with ARB—prepared a state plan to increase the use of alternative fuels in California. As discussed below, the state currently administers three major incentive programs related to advanced transportation and low-carbon fuels.

#### **Alternative and Renewable Fuel and Vehicle Technology Program—CEC**

**Purpose.** Chapter 750, Statutes of 2007 (AB 118, Núñez), commonly referred to as AB 118, created the Alternative and Renewable Fuel and Vehicle Technology Program. Specifically, the legislation required the CEC to “develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies.” In doing so, CEC provides grants and loans for the development of alternative fuels and related technologies including electricity, ethanol, renewable diesel, natural gas, hydrogen, and biomethane. Authorization for the program is scheduled to expire December 2015.

**Funding.** The Alternative and Renewable Fuel and Vehicle Technology Program is funded through fees on state vehicle registrations, vessel registrations, and identification plates, as collected by the Department of Motor Vehicles. Since it was established in 2007, a total of \$378 million has been spent. As indicated in Figure 1, the CEC

is estimated to spend about \$122 million on the program in 2012-13.

### **Air Quality Improvement Program (AQIP)—ARB**

*Purpose.* Assembly Bill 118 also directed ARB to create the AQIP, an incentive program that is intended to improve air quality by providing funding for the purchase of light-duty vehicles, hybrid and zero-emission trucks, as well as other types of equipment that are less polluting. Each year, ARB creates a funding plan for expending the AQIP funds, which are appropriated each year to ARB in the annual state budget. The funding plan establishes ARB's priorities for the funding cycle, describes the projects ARB intends to fund, and sets funding targets for each project.

*Funding.* Funding for AQIP comes from smog abatement fees and vehicle registration fees. Since 2009, a total of \$109 million in incentives have been provided for on and off-road equipment projects; projects to mitigate off-road gasoline exhaust; lawn and garden equipment replacement; and medium- and heavy-duty vehicle/equipment projects including lower emission school buses, electric, or hybrid vehicles/equipment.

### **Advanced Transportation and Alternative Source Manufacturing Sales and Use Tax (SUT) Exclusion Program—CAEATFA**

*Purpose.* Chapter 10, Statutes of 2010 (SB 71, Padilla) authorized CAEATFA to approve SUT exclusions on property that is used for the design, manufacture, production, or assembly of advanced transportation and alternative energy technologies.

*Funding.* To date, the program has approved SUT exclusions for entities in the following fields: electric vehicle manufacturing, solar photovoltaic manufacturing, landfill gas capture and production, biogas capture and production (dairies and waste water treatment plants), demonstration

hydrogen fuel production, electric vehicle battery manufacturing, and biomass processing and fuel production. The CAEATFA has the authority to provide up to \$100 million in tax exclusions on an annual basis. As illustrated in Figure 1, roughly \$200 million in tax exclusions have been provided to date.

### **ENERGY RESEARCH**

Finally, the state funds research in the energy sector that focuses on (1) creating greater efficiencies in traditional energy delivery systems and (2) developing new alternative forms of energy. As we discuss below, the state's major energy research program is the Public Interest Energy Research (PIER) program. We also note that the University of California spends a significant amount of money on research related to energy efficiency and alternative energy. While some of this research is supported with PIER funding, other fund sources include federal funding from the Department of Energy. For example, Lawrence Berkeley National Laboratory, which conducts a wide range of energy-related research, has an annual budget of roughly \$800 million in federal funds.

### **PIER Program—CEC**

*Purpose.* Prior to deregulation of the state's electricity markets in 1996, most energy research was driven by utilities themselves and coordinated through the national Electric Power Research Institute (EPRI). Through EPRI, utilities were able to pool resources in order to advance technological development and understanding in the area of electricity generation, delivery, and use. During this time, California's IOUs were allowed to recover costs associated with this research activity through the rate-making process at the CPUC. Under a newly deregulated system, however, there was a concern that IOUs would have an incentive to cut

costs and thus limit spending on research. In order to address this concern, AB 1890 specified that a portion of the public goods charge would fund a new public interest energy research, development, and deployment program—referred to as the PIER program.

The PIER program, which is administered by CEC, provides grants for research to develop, and help bring to market, energy technologies that benefit the environment, provide greater system reliability, lower system costs, and provide other tangible benefits to California electric and natural gas utility customers. Specifically, the program has supported (1) renewable energy research, (2) environmentally preferred advanced energy generation research, (3) residential and commercial building energy efficiency research, (4) advanced transportation research, and (5) climate change research.

**Funding.** The PIER program has been funded from the public goods charge. Since the program's inception, a total of \$556 million has been spent on the program. As previously discussed, since the public goods charge was not reauthorized by the Legislature, the Governor has directed CPUC to collect an electric program investment charge to support energy research, as well as other related efforts.

## PROGRAM EVALUATIONS

Many of the energy efficiency and alternative energy programs discussed above are required to report certain information on a periodic basis. For the most part, these reports focus on how program funds were spent (such as the specific projects that were funded and how much money was allocated to each project). Some of the programs, however, do include an evaluation component that focuses on the cost-effectiveness of that program. For example, the CPUC contracts out for an annual evaluation of the IOU energy efficiency programs. One such

evaluation found that IOU programs achieved a benefit-cost ratio of 2.67 in 2004-05—meaning that the benefit of reducing energy consumption through these programs is greater than the cost associated with implementing it. We note, however, that the most recent evaluation found that the programs only achieved an estimated benefit-cost ratio of 1.36. While this outcome is positive, it is a decline from prior years, which suggests that the state is now receiving diminishing returns on these particular energy efficiency investments. The CPUC has acknowledged such diminishing returns and plans to transition its focus to programs that have a more long-term market transformation goal. However, CPUC also acknowledges that such a goal may not be cost-effective in the short run, but hopes that it will be cost-effective in the long run.

The CPUC also contracted out for an evaluation of the CSI program in 2011 to determine whether the program was achieving its stated goal of creating a self-sustaining market for solar. The evaluation also examined the cost-effectiveness of the program. The evaluation found that from 2007 through the end of 2010 the program provided incentives to nearly 55,000 sites, which equals 689 MW in small solar installations. This is roughly 40 percent of the program's goal of 1,940 MW of installed solar capacity by 2016. The analysis found that even with declining installation costs, grid-supplied electricity is still less expensive than solar.

Assembly Bill 109 requires the CEC to conduct an evaluation of the Alternative and Renewable Fuel and Vehicle Technology Program. The evaluation must include the expected benefits and overall contributions toward promoting a transition to alternative fuels. The CEC completed its initial evaluation in 2011. While this evaluation included some initial findings, it is difficult to isolate what the program's effect will be on transforming California's fuel and fuel vehicles in the long run.

## **NEW FUNDING FOR ENERGY EFFICIENCY AND ALTERNATIVE ENERGY PROGRAMS**

As discussed above, the state has and continues to spend a significant amount of funds on programs related to energy efficiency and alternative energy. In the near future, new funding will be available to support such programs as a result of the state's cap-and-trade auctions and the passage of Proposition 39 by the voters in November 2012.

### **Cap-and-Trade Auction Revenue**

The Global Warming Solutions Act of 2006 (Chapter 488, Statutes of 2006 [AB 32, Núñez/Pavley]), commonly referred to as AB 32, established the goal of reducing GHG emissions statewide to 1990 levels by 2020. Among other provisions, the legislation directed the ARB to develop a plan to meet this goal. As part of its plan to reduce California's GHG emissions, ARB developed a cap-and-trade program that sets an aggregate limit or "cap" on total GHG emissions allowed. In order to comply with the regulation, a "covered entity" must obtain one allowance for every ton of emission that it emits in a given compliance period. While some of the allowances will be given away for free, the program includes quarterly auctions of carbon allowances.

The 2012-13 budget assumed a total of \$1 billion in revenue would be generated from the cap-and-trade auctions in 2012-13. However, the state's first cap-and-trade auction, which was held in November 2012, only raised about \$55 million in revenues for the state. As such, the amount of auction revenue that will be generated in 2012-13 will likely be significantly less than assumed in the budget. Based on an opinion that we received from Legislative Counsel, the revenues generated from ARB's cap-and-trade auctions would constitute "mitigation fee" revenues. As a result, a clear nexus must exist between an activity for which a

mitigation fee is used and the adverse effects related to the activity on which that fee is levied. Therefore, in order for their use to be valid as mitigation fees, revenues from the cap-and-trade auctions must be used only to mitigate GHG emission or the harms caused by GHG emissions.

For 2012-13, the administration is required to provide an expenditure plan for the auction revenues to the Legislature prior to expenditure of these funds. In determining the allocation of cap-and-trade auction revenues, the Legislature will want to consider the state's energy efficiency and alternative energy programs that currently focus on reducing GHG emissions.

### **Proposition 39— Clean Energy Job Creation Fund**

Proposition 39, starting in 2013, eliminates the ability of multistate businesses to choose the way in which their taxable income is determined. Instead, most multistate businesses will have to determine their California taxable income using a single sales factor method. Consequently, some corporations will pay higher taxes, resulting in projected half-year revenues of \$450 million in 2012-13 and an estimated \$1 billion per year thereafter. Under the measure, half of the annual revenues—up to \$550 million—will be deposited into a new Clean Energy Job Creation Fund to support projects intended to improve energy efficiency and expand the use of alternative energy for a five-year period (2013-14 through 2017-18).

Specifically, Proposition 39 states that the funds in the Clean Energy Job Creation Fund could be used to support: (1) energy efficiency retrofits and alternative energy projects in public schools, colleges, universities, and other public facilities; (2) financial and technical assistance for energy retrofits; and (3) job training and workforce development programs related to energy efficiency

and alternative energy. The Legislature will determine spending from the fund and is required to use the monies for cost-effective projects run by agencies with expertise in managing energy projects. Proposition 39 also (1) specifies that all

funded projects must be coordinated with CEC and CPUC and (2) creates a new nine-member oversight board to annually review and evaluate spending from the fund.

## STATE LACKS COMPREHENSIVE STRATEGY FOR ENERGY EFFICIENCY AND ALTERNATIVE ENERGY

In recent years, some attempt has been made by the different state departments to coordinate the state's energy policies. For example, in 2010, the state's energy-related departments developed the California Clean Energy Implementation Plan, which is essentially a coordinated roadmap to achieve the state's energy goals. Despite these efforts, our review and preliminary assessment of the state's major energy incentive programs finds that the state currently lacks a comprehensive framework that fully coordinates these activities to help ensure that the state's goals are being achieved in the most cost-effective and cost-efficient manner.

The absence of such a comprehensive framework (1) results in some program duplication, (2) results in some departments making policy choices that may not be aligned to legislative priorities, and (3) makes it difficult to compare the effectiveness across programs.

**Program Duplication.** Administration and oversight of the state's numerous energy programs is complicated by the fact that multiple departments have overlapping jurisdiction in energy policy areas. As a result, some of these programs have similar goals and duplicative functions. For example, both CEC and CPUC administer energy efficiency programs as well as renewable energy programs. Additionally, both CEC and ARB administer portions of the programs established in AB 118. The fact that these programs generally were created piecemeal over the years

is another reason why many of them have similar goals. Such program duplication can be inefficient and wastes valuable resources. Minimizing program duplication and overlap would create greater efficiencies and effectiveness in the state's energy efficiency and alternative energy efforts.

**Efforts May Not Be Aligned to Legislative Priorities.** Our review also found that some programs have been developed without legislative direction. The largest of such programs are the IOU energy efficiency programs administered by the CPUC. Many of these IOU programs have the goal of fundamentally transforming markets. Achieving such a long-term goal requires upfront costs that generally outweigh the short-term benefits that might be achieved. As previously noted, CPUC plans to shift the emphasis of its energy efficiency programs even more so towards market transformation activities. The absence of a comprehensive framework makes it difficult to determine whether such a major shift in California's energy policy is aligned with legislature priorities.

**Difficult to Evaluate Effectiveness Across Programs.** While some of the energy efficiency and alternative energy programs we reviewed have an evaluation component, the state has not methodically assessed all of these programs. As such, the state does not currently evaluate the *relative* cost-effectiveness of all programs. Such an evaluation would include a comparison

of programs' marginal costs of achieving the state's energy goals and, thus, would help provide program feedback for policymakers. In addition, given that there are multiple departments involved in administering the various programs, departments have developed their own set of evaluation metrics and methods specific to their programs—making it difficult to compare the relative effectiveness of one program to another. Thus, it is currently difficult for the Legislature to ensure that the state is expending resources where it can get the biggest bang for its buck.

The existence of common evaluation methods would help the Legislature better understand the investments it is making in energy efficiency and alternative energy and what the impact would be if it decided to reduce or increase its investments in particular programs. This is particularly important given that the Legislature will need to decide how to invest the additional funding that will be available from the cap-and-trade auctions and Proposition 39.

## DEVELOPING A COMPREHENSIVE STRATEGY

In view of the above, we recommend that the Legislature develop a comprehensive strategy for meeting the state's energy efficiency and alternative energy objectives. Given that the state has numerous programs administered by multiple departments, we recommend that the Legislature designate a lead agency to develop such a comprehensive strategy. We find that the CEC would be in the best position to lead the development of this strategy, since it is the state's primary energy policy planning agency. In addition, CEC could develop such a strategy as part of its existing Integrated Energy Policy Report (IEPR) process. Under current law, CEC is required to develop a biennial IEPR that provides information on trends and issues concerning electricity and natural gas, transportation, energy efficiency, renewables, and public interest energy research in the state. Accordingly, we recommend that the Legislature adopt legislation requiring CEC to develop—in coordination with other relevant departments (such as CPUC and ARB)—a comprehensive strategy to be submitted for legislative consideration by January 2014 with

the Governor's proposed budget. In general, the comprehensive strategy should specify:

- ***State's Energy Efficiency and Alternative Energy Goals.*** First, the plan should identify specific goals that the state's energy efficiency and alternative energy efforts are attempting to achieve. In order to ensure that these goals are aligned with legislative priorities, it will be important for the Legislature to provide guidance to CEC on what the statewide goals should be. For example, the Legislature will want to weigh in as to whether the focus should be on achieving short-term, immediate benefits versus more long-term market transformation benefits.
- ***How Programs Fit Together to Achieve State's Goals.*** The plan should also discuss how the objectives of each energy efficiency and alternative energy program are aligned to state's energy goals. In other words, the objectives of a given program should be linked to one or more of the state's goals.

Moreover, in order to minimize program duplication, the plan should outline how the different programs fit together as part of an overall strategy for increased energy efficiency and the use and development of alternative energy. In addition, the plan should review the proposed use of cap-and-trade auction revenues and Proposition 39 revenues. As previously discussed, the administration will be presenting an expenditure plan to the Legislature regarding cap-and-trade auction revenues and a newly created oversight board will be reviewing possible uses of the Clean Energy Job Creation Fund established by Proposition 39. A comprehensive plan will help ensure that the future use of these funds is in the most cost-effective manner.

- ***How Program Effectiveness Will Be Measured.*** Finally, the plan should specify how each program will be evaluated against one another based on a common metric to determine the most cost-effective approaches for meeting the state's energy goals. This type of analysis—which probably should be contracted out for—should include a comparison of the incremental costs and benefits of all programs. We acknowledge there would likely be some cost associated with this approach. Given the billions of dollars being expended on such programs, this type of analysis would provide the Legislature greater insight into the relative effectiveness of the state's current energy programs.

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This brief was prepared by Tiffany Roberts and reviewed by Anthony Simbol. The Legislative Analyst's Office (LAO) is a nonpartisan office that provides fiscal and policy information and advice to the Legislature.

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