

Assembly Committee on Utilities and Commerce
Briefing Paper for Oversight Hearing

Energy Efficiency – Measuring for Success
Coordination, Collaboration, Transparency
March 6, 2013

California has and will continue to support and increase its commitment to achieving greater levels of energy efficiency but several important questions must be asked:

- Is California on track to achieve energy and climate goals for energy efficiency?
- Why is demand for electricity growing despite billions invested in energy efficiency by ratepayers?
- Does California have adequate monitoring of programs and results?
- Are state agencies and departments coordinating and collaborating successfully or enough on energy efficiency goals and programs?

SUMMARY

In response to a directive in the 2012-13 Budget Package the Legislative Analyst's Office (LAO) released a report in December 2012 titled "Energy Efficiency and Alternative Energy Programs." The report explored over a dozen major programs that are intended to support the development of energy efficiency and alternative energy in the state. It found that over the past 10 to 15 years, the state has spent a combined total of approximately \$15 billion on such efforts, the majority of which has been funded by utility ratepayers.

In testimony given before the Senate Energy, Utilities and Communications Committee in January 2013, the California Public Utilities Commission (PUC), the California Energy Commission (CEC), and the California Independent System Operators (CAISO) concurred with LAO's assessment that the state's major energy incentive programs currently lack a comprehensive framework that fully coordinates activities to help ensure that the state's goals are being achieved in the most cost effective manner and are working on improving it.

This hearing will investigate how California can ensure that it is achieving greater levels of energy efficiency and if there is sufficient collaboration among state agencies and departments to ensure that the energy efficiency goals will be met.

1. INTRODUCTION

Energy efficiency is the most important way California can address the State's demand for energy. For ratepayers, energy efficiency has been the least expensive way to meet energy demand, thus reducing the need for new energy resource additions (power plants of any type – renewable, fossil-fuel, storage, etc.). Through energy efficiency, businesses can be more profitable by saving money on energy bills and homeowners will have more affordable energy bills without compromising comfort or other needs.

California statute requires Investor Owned Utilities¹ (IOUs) to "first meet its unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible."² This is referred to as 'the loading order,' meaning that new energy resources are procured in the following order: (1) Energy efficiency and demand response; (2) Renewable energy resources; (3) Clean and efficient fossil generation. As a result of this prioritization, many programs have been funded toward achieving greater levels of energy efficiency.

It is important to note that energy efficiency does not always result in reduced demand for electricity or natural gas usage. In some cases, energy efficiency can increase energy usage. When customers increase their energy usage following acquisition of an energy efficiency improvement it is called the 'rebound' effect.

2. ARE STATE ENERGY AGENCIES AND DEPARTMENTS WORKING TOGETHER?

Recent reports found California lacking a comprehensive and coordinated state energy policy:

- Rewiring California: Integrating Agendas for Energy Reform, Little Hoover Commission, November 2012

"In the end, the [Little Hoover] Commission reached the same conclusion as in prior reviews of energy governance – that the current structure lacks clarity and accountability. Organizational reform is essential if the state is to realize its manifold energy and environmental goals. The Commission recommends the Governor and the Legislature take steps now to modernize energy governance."

¹ Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, and Southern California Gas Company

² 454.4(b)(9)(C) of the Public Utilities Code

- Energy Efficiency and Alternative Energy Programs, California Legislative Analyst's Office (LAO), December 2012

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.

3. WHO ARE THE REGULATORS?

The California Public Utilities Commission (PUC) regulates the publicly owned utilities in California. About 75% of the state's electricity customers are served by regulated electric utilities and nearly all of California's residential and commercial gas customers are served by regulated gas utilities.

The California Air Resources Board (ARB) regulates air quality and regulates greenhouse gas (GHG) emissions to reduce GHG emissions to 1990 levels.

In addition to the PUC and CEC energy efficiency programs, other entities also administer energy efficiency programs:

- California State Treasurer's Office: Within the California State Treasurer's Office, the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) administers a Clean Energy Upgrade Financing Program)

The State Treasurer also provides up to \$381 million of Qualified Energy Conservation Bonds (QECBs) to provide low-interest financing Opportunities for State, Local, and Tribal Governments and up to 30% of Allocation for Privately Owned or Operated Projects

- Publicly Owned Utilities (POUs): Publicly owned utilities also implement energy efficiency programs. POUs spent a total of \$123 million in 2010 on energy efficiency programs.³

Proposition 39 Administrator: In 2012, California voters approved Proposition 39, the Clean Energy Job Creation Fund which will provide up to \$550 million annually until 2018 to fund projects that will create jobs improving energy efficiency and expanding clean energy generation.

³ <http://www.energy.ca.gov/2011publications/CEC-200-2011-007/CEC-200-2011-007-SD.pdf>

4. IS CALIFORNIA ON TRACK TO ACHIEVE ENERGY AND CLIMATE GOALS FOR ENERGY EFFICIENCY?

California's current annual energy efficiency goals are nearly half the goal specified to be met in order to meet the state's climate change goals.

- The PUC's 2013-2014 ratepayer-funded efficiency programs are targeted to produce energy savings equivalent to 1,983 Gigawatt-hours⁴ (GWh electricity) and 47 million therms⁵ (natural gas) per year over the two year period.
- The California Air Resources Board (ARB) Scoping Document set a target of 32,000 GWh and 800 million therms over the period of 2010 to 2020, or 3,200 GWh/year and 80 million therms per year.

Prior energy savings goals for the period of 2010-2012 adopted by the PUC are similarly below the ARB targets.

5. WHY IS DEMAND FOR ELECTRICITY GROWING DESPITE BILLIONS OF RATEPAYER DOLLARS INVESTED?

According to The Utility Reform Network (TURN), a ratepayer advocacy organization,

"Absolute total and residential electricity consumption levels increased by 10% and 13%, respectively from 2002-2010. Per capita total and residential electricity use increased by 3% and 6% respectively for the same time period. Up to the 2008 Recession, absolute total and residential electricity use increased 14% and 18% respectively 2002-2008; while per capita total and residential use increased 9% and 13% respectively for the same time period."

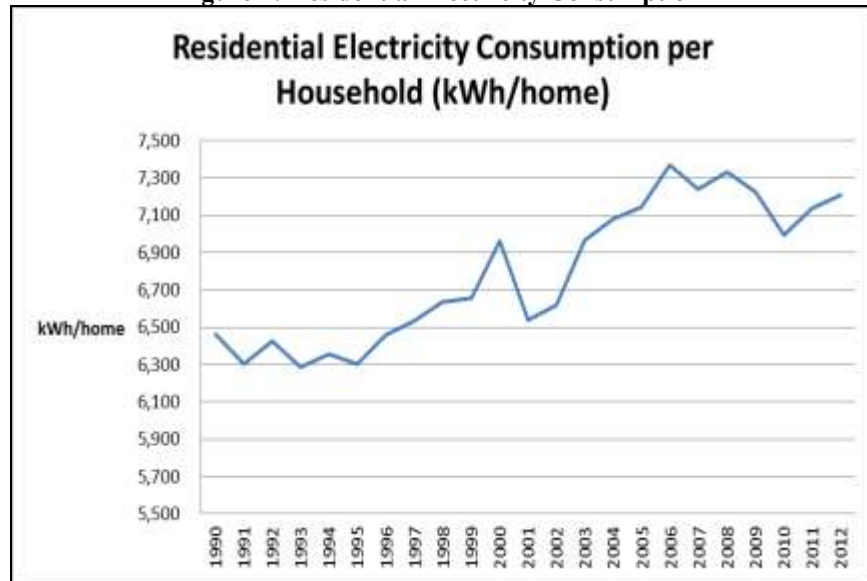
This is noteworthy because growth has continued despite a homebuilding downturn and substantial ratepayer-funded programs for 'self-generation' incentives for solar photovoltaic, fuel cell, wind energy, and other technologies that are designed to offset on-site energy consumption. Residential solar photovoltaic installations reportedly total nearly 507 megawatts (MW) of electricity capacity.⁶

⁴ Gigawatt-hours (GWh) are a unit of measurement for electricity.

⁵ Therms are a unit of measurement for natural gas.

⁶ <http://www.californiasolarstatistics.ca.gov/>

Figure 1: Residential Electricity Consumption⁷



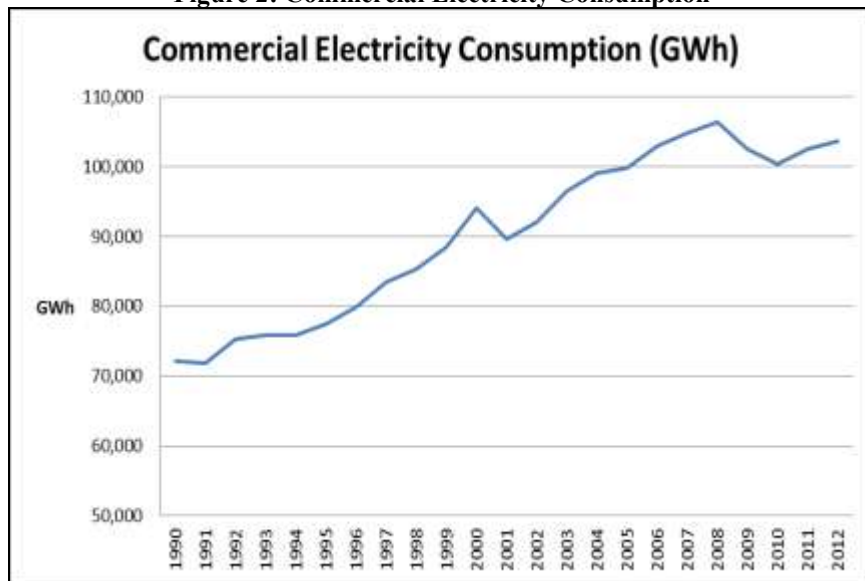
Residential natural gas consumption has dropped and appears to be leveling off or growing slightly (See Appendix A).

For Commercial buildings, electricity consumption is trending upward but declined most precipitously during the period dominated by the Recession. Again, ratepayers fund not only energy efficiency but also self-generation technologies for commercial businesses.

Nonresidential solar photovoltaics installations reportedly total 900 MW of electricity capacity.

⁷Source: California Energy Commission

Figure 2: Commercial Electricity Consumption

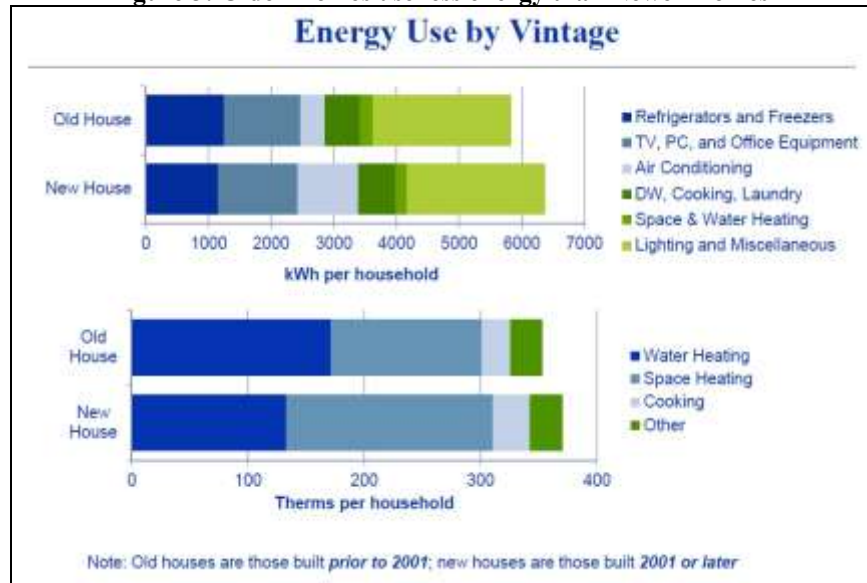


On a per square foot basis, commercial electricity consumption appears to be decreasing, which could be an indication that energy efficiency is increasing or that the types of businesses in California are changing to less- electricity intensive business types. Commercial natural gas consumption appears to have undergone significant reductions (See Appendix A).

Energy consumption trends for other types of customers (industrial, agriculture, streetlighting) appear to be flat or growing slightly (See Appendix A). Information on government facility energy consumption, including schools, was not available.

The CEC's recent scoping report on Comprehensive Energy Efficiency Program for Existing Buildings (AB 758, Skinner, 2009) showed that **older** single family residential homes use less electricity and natural gas than newer homes (Figure 1) even though newer homes must meet energy efficiency regulations. Some of this could be attributed to changes in average home size but further examination is needed to compare energy usage in similar size structures, various types of housing units (multifamily apartments, condominiums, etc.), or other factors that could contribute to increased energy consumption.

Figure 3: Older Homes use less energy than Newer Homes⁸



A recent study by the Energy Institute at Haas, University of California, Berkeley, examining a large-scale appliance replacement program involving 1.5 million households, found that:

"... refrigerator replacement reduces electricity consumption by an average of 11 kilowatt hours per month, about a 7% decrease. We find that air conditioning replacement, in contrast, increases electricity consumption by an average of 6 kilowatt hours per month, with larger increases during the summer."⁹

It is unclear whether the PUC or CEC have developed programs to ensure that energy efficiency programs targeting older homes will result in decreased energy usage.

6. IS FUNDING ADEQUATE?

Over the past 10 to 15 years, the state has spent a combined total of roughly \$15 billion on energy efficiency and alternative energy programs. 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."¹⁰ Of this, \$15 billion nearly \$10 billion has been allocated to a variety of energy efficiency programs.

⁸ *ibid*

⁹ http://ei.haas.berkeley.edu/pdf/working_papers/WP230.pdf

¹⁰ The LAO report did not include ratepayer-funded programs administered by Publicly Owned Utilities or other state entities such as the Community Services Department. Nor did the report include funding for separate and additional low income energy assistance programs that are funded by ratepayers which provide energy efficiency retrofits at no cost.

In November 2012 the PUC adopted 2013-2014 budgets for ratepayer-funded energy efficiency programs at \$1 billion per year over the two year program.

In addition, the Legislature approved SB 1018 (Statutes of 2012), which added Section 748.5 to the Public Resources Code and allows the Public Utilities Commission may allocate up to 15% of the greenhouse gas (GHG) auction revenues allocated to California ratepayers to be used for energy efficiency and clean energy programs. To date the ARB has conducted two GHG auctions and more are planned in the future. The PUC has not allocated funds from the first GHG auction toward energy efficiency and clean energy programs.

7. DOES CALIFORNIA HAVE ADEQUATE MONITORING OF PROGRAMS AND RESULTS?

There is no public database showing where energy efficiency improvements are occurring, how much was spent to acquire the improvements, or the results of those improvements.

Lack of public information prevents assessment of which programs are working well, need improvement, should be discontinued, or are duplicative with other programs. This limits program evaluation to the PUC, consultants working for the PUC, or utilities and causes delays in assessing programs until well after the program funds have been spent.

The PUC currently has a rulemaking underway to consider whether an Energy Data Center is in the public interest. The goal of the research center would be to encourage “independent research and analysis of current state, Commission and utility programs using customer-specific data but publishing results of that data in an aggregated and anonymized form that protects customers’ privacy.” In addition, the PUC's proposed 2013-2014 Energy Efficiency Budget allocates \$1.4 million to energy efficiency program data management.¹¹

Yet ratepayers may have funded at least three databases already.

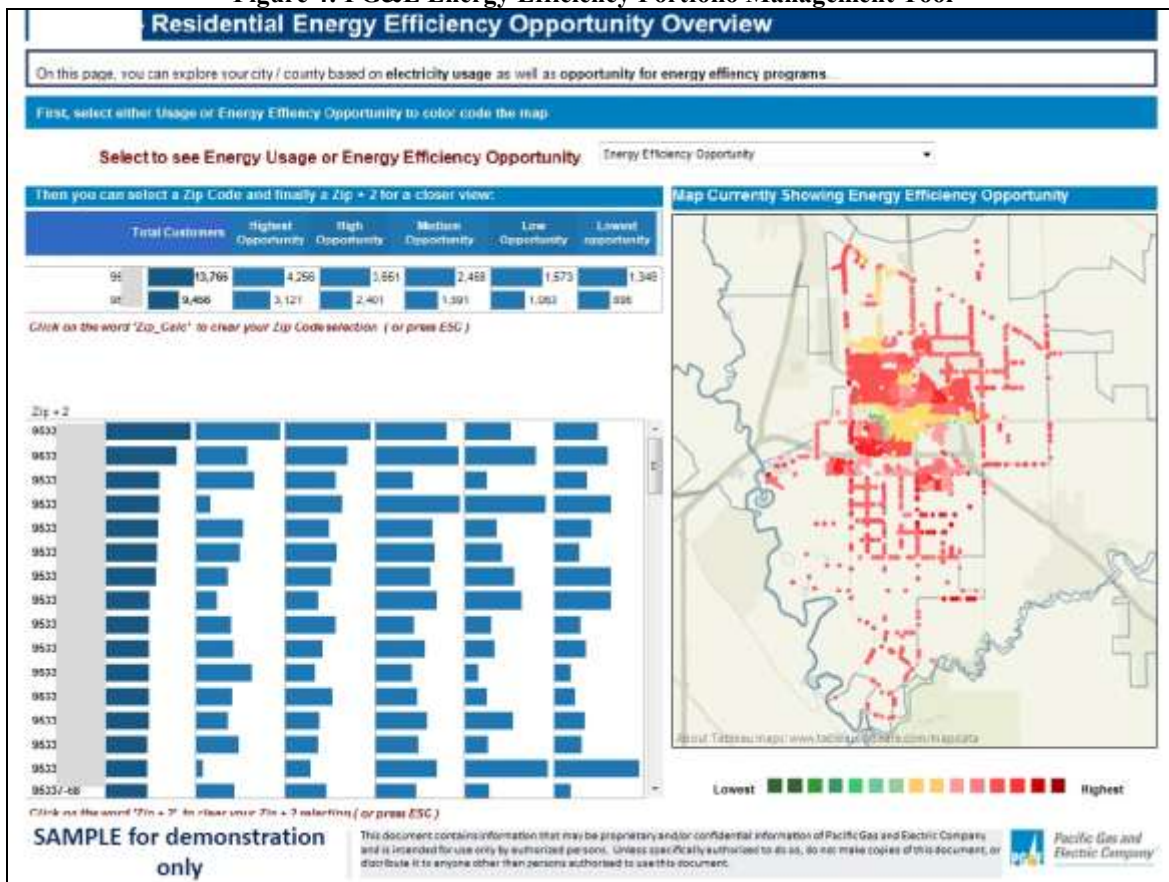
- The Cadmus Group¹² created a database through a ratepayer-funded contract with the PUC. The database covers 1990–2010, and includes data for: 56 electric and 6 natural gas investor-owned, public, and rural cooperative utilities; and 59 California counties including consumption of electricity and natural gas; Personal income; Electricity and natural gas prices; Residential and commercial new construction, renovations, and total floor space; Heating degree days (HDDs) and cooling degree days (CDDs); Population; Residential and nonresidential new construction and renovations; Air conditioning (2000–2010 only) and electric and gas heating saturations; and utility energy-efficiency and demand-side management (DSM) program expenditures.

¹¹ [http://www.energydataweb.com/cpucFiles/pdaHomeDocs/2/2013-2014_EMV_Workplan_Final_6_1-31-2013_WithRoadmaps%20\(2\).pdf](http://www.energydataweb.com/cpucFiles/pdaHomeDocs/2/2013-2014_EMV_Workplan_Final_6_1-31-2013_WithRoadmaps%20(2).pdf)

¹² Preliminary Results from Macro Consumption Modeling (Updated), Jim Stewart, Ph.D. and Hossein Haeri, Ph.D., August 22, 2012

- Demand Research LLC¹³ created a database encompass over 6,000 California census tracts that make up the service territories of the IOUs. The source of the energy consumption data are the utility monthly customer billing data that are annualized, address-normalized, and merged by 2010 census tracts. The data span 2006 through 2010.
- PG&E's Energy Efficiency Portfolio Management Tool which shows where savings have occurred by customer class and type of technology, the greatest opportunity for potential savings down to census tract and neighborhood, specific commercial customers that have not taken advantage of energy efficiency incentives, and tracks performance of low income program by median family income data by census tracts. A screen shot of the PG&E management tool is shown in Figure 4 below. Additional screen shots containing additional data are included in the Appendix.

Figure 4: PG&E Energy Efficiency Portfolio Management Tool



¹³ Macro Consumption Metrics Pilot Study Technical Memorandum – Preliminary Findings, Marvin Horwitz, Demand Research LLC., August 21, 2012, <http://www.energydataweb.com/cpucFiles/pdaDocs/866/HOROWITZ-MCM%20Technical%20Memo%20August%2021%202012.pdf>

Privacy concerns may inhibit making all energy efficiency data publicly available. However, precedent for making program data available for ratepayer-funded programs is currently allowed by the PUC through the California Solar Initiative program.¹⁴ Any member of the public can obtain disaggregated data on individual solar projects, including cost, location, products used (without compromising individual customer information), and compiled data show program progress and budget expenditures.

Given the recent Department of Finance (Office of State Audits and Evaluations) audit¹⁵ of the PUC which found "significant weaknesses within PUC's budget operations which compromise its ability to prepare and present reliable and accurate budget information," it would be useful to have public accountability as to the use and status of the ratepayer funds allocated to energy efficiency programs.

¹⁴ www.californiasolarstatistics.ca.gov

¹⁵ http://www.dof.ca.gov/osae/audit_reports/documents/FinalReport-CaliforniaPublicUtilitiesCommissionPerformanceAuditWEB.pdf