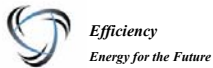


The California Energy Commission's Peak Load Reduction Program

Presented By: Monica Rudman
California Energy Commission
(916) 654-4006
mrudman@energy.state.ca.us

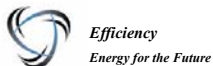
Prepared for: ACEEE Conference on Energy Efficiency as a
Resource
June 9 – 10, 2003



Peak Reduction Program Authorization and Funding

The California Legislature passed several bills to alleviate the energy crisis

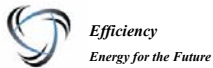
- In August 2000, AB 970 allocated \$50 Million to CEC
- In April 2001, SB 5X and AB 29X allocated \$327 Million to CEC



Monica Rudman, Figure 2

Primary Objective Drove Program Development and Design

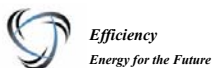
- ◆ Goal was to implement emergency activities that would reduce California's peak demand in a way that would be timely to help to mitigate the energy crisis
- ◆ Program development and design activities occurred in very compressed time period of a few months (for utility-sponsored programs this process normally takes two years)



Monica Rudman, Figure 3

How are Peak Load Savings Defined ?

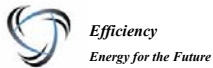
- ◆ Efficiency-Related Peak Load Reductions
Average kW reduction 2 pm to 6 pm on non-holiday weekdays,
June through September
- ◆ For Demand – Responsive Reductions
Pilot test results were used
Measured potential for savings



Monica Rudman, Figure 4

Program Elements Developed by the Energy Commission

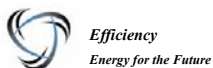
- ◆ Agricultural Peak reduction
- ◆ Cool Roofs/Cool savings
- ◆ Demand Responsive Building Systems
- ◆ Energy Conservation Assistance Act (ECAA)
- ◆ Innovative Program
- ◆ LED Traffic Signals
- ◆ Real Time Meter
- ◆ State Buildings
- ◆ Water/Wastewater
- ◆ Evaluation
- ◆ Marketing



Monica Rudman, Figure 5

Some Agencies Received Pass-through Funding

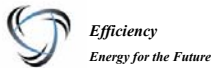
- ◆ State Consumer Services Agency for Classroom Outreach Program
- ◆ Municipal Utilities for various programs



Monica Rudman, Figure 6

Agriculture Peak Load Reduction Program Element Description

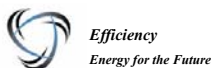
- ◆ Incentives for installations of more efficient processing equipment, pump repair, installation of metering and telemetry systems to participate in demand response and alternative fuel projects
- ◆ Funding is distributed through two administrators: The Center for Irrigation Technology (a division of Cal State University, Fresno) and the Irrigation Training and Research Center (at Cal State University, San Luis Obispo)
- ◆ The Energy Commission also has direct contracts with: Onsite Energy, Inland Empire utilities Agency, Emeters, San Diego Gas and Electric Company, Southern California Edison, Southern California Public Power Authority, Trade and Commerce, and the Western United Research and Development, Inc.



Monica Rudman, Figure 7

Cool Roofs/Cool Savings Program Element Description

- ◆ Incentives for installations of roofing materials that are highly reflective and emissive to reduce building cooling loads
- ◆ Mainly targets large flat or low-sloped commercial and industrial roofs
- ◆ Five program administrators are directly responsible for promoting program, enlisting participants, verifying eligibility, verifying project completion and paying incentives
- ◆ The five program administrators are: Local Government Commission, Los Angeles Department of Water and Power, Sacramento Municipal Utility District, the Sacramento Tree Foundation, and the San Diego Regional Energy Office



Monica Rudman, Figure 8

Demand Responsive Buildings Program Element Description

- ◆ Funds installation of metering, control, and communication systems that enable facilities to curtail load in response to emergency electricity shortage notices
- ◆ Sub Element One: funds are administered through contractors who recruit and aggregate loads of medium and large commercial and industrial facilities. Contractors included: Global Energy Partners, San Diego Regional Energy Office, Sieben Energy Associates, SCE, PG&E, Apogee, ENRON, City of Roseville
- ◆ Sub Element Two: the Energy Commission administers grants directly to C&I customers who implement projects at their own facilities.
- ◆ Sub Element Three: contractors recruit smaller customers with connected loads of less than 200kW. Contractors are Webgen and ICF Consulting.



Efficiency
Energy for the Future

Monica Rudman, Figure 9

Demand Responsive Buildings Program Element Description (continued)

- ◆ Sub Element Four: contractors receive funds to administer pilot programs that aggregate curtailable loads among residential customers. Contractors are SMUD and Energyn.

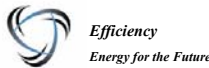


Efficiency
Energy for the Future

Monica Rudman, Figure 10

ECAA Loans Program Element Description

- ◆ Energy Commission issues 3% interest rate loans to local governments, schools, hospitals, special districts and public care facilities to save energy through electricity and natural gas projects
- ◆ Peak electricity savings are a beneficial result
- ◆ There are 72 approved loans using AB 29x funding, at this time. Each loan recipient will install one or more projects.
- ◆ Projects include Lighting, HVAC, LED traffic signals, and Miscellaneous projects.



Monica Rudman, Figure 11

Innovative Program Element Description

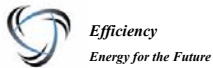
- ◆ Program supported technologies that didn't fit into the other program categories (includes renewable energy development, energy efficient equipment retrofits, process improvements, installation of generation equipment, building envelope improvements, and curtailment programs)
- ◆ The Energy Commission administers a large grants segment, targeting projects that save more than 400 kW
- ◆ Xenergy administers the small grants segment, targeting projects that save more between 20 kW and 400 kW
- ◆ There are nine third party administrator contracts, each of which developed individual targets, requirements, recruitment methods and payment methods



Monica Rudman, Figure 12

Water/Wastewater Program Element Description

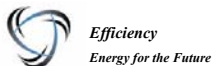
- ◆ The AB 970 funded portion of the program element offered grants to municipalities that installed peak load reduction or electricity supply augmentation projects at their water treatment facilities
- ◆ The SB 5x funded portion of the program element offered incentives to retrofit diesel and natural gas generators to reduce emissions and made payments to municipalities for kilowatts saved as a result of new generation, load shifting, and energy efficiency projects at water and wastewater treatment facilities
- ◆ SB 5x funded portion of the program element is administered through HDR, Inc



Monica Rudman, Figure 13

Light -Emitting Diodes Traffic Signals Program Element Description

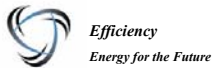
- ◆ Provided grants to municipalities and CalTrans to cover a portion of the costs of replacing incandescent traffic bulbs with LEDs
- ◆ Eligible public agencies applications were accepted on a first come first served basis
- ◆ A total of 57 grantee projects received funds.



Monica Rudman, Figure 14

State Building Peak Reductions Program Element Description

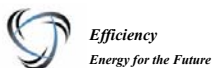
- ◆ Offered contracts to State agencies and universities for the installation of energy efficiency or demand response systems



Monica Rudman, Figure 15

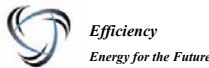
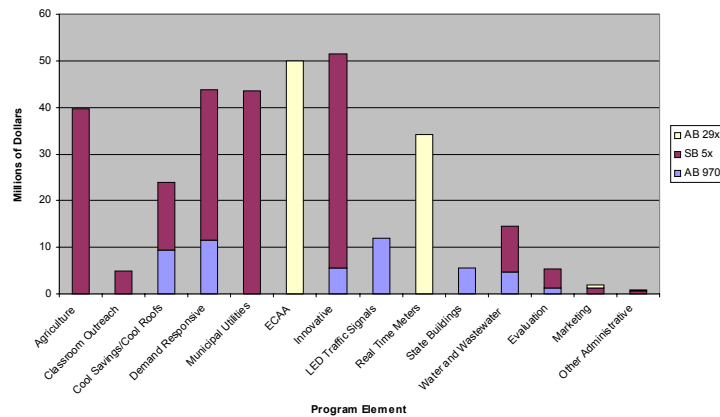
Real-Time Meters Program Element Description

- ◆ Installation of real-time meters and appropriate communications links to electric utility commercial customers. Meters allow for monitoring of energy use by time period.
- ◆ Electric utility customers with facilities that have a peak demand of 200 kW or above were eligible for this program.
- ◆ Customers participating in a utility-sponsored load reduction/curtailment program or in the 20/20 program received priority from the utilities for installation of a real-time meter.



Monica Rudman, Figure 16

California Energy Commission's Peak Load Reduction Program Element Funding



Monica Rudman, Figure 17

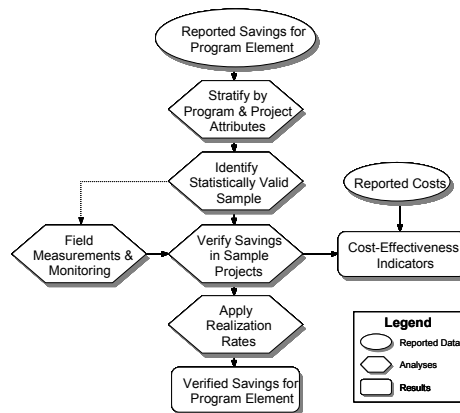
Evaluation, Measurement and Verification for Peak Load Reduction Program (PLRP)

- ◆ Nexant was hired to independently evaluate eight PLRP elements: Agricultural, Cool Roofs, Demand Responsive Building Systems, ECAA, Innovative, LED Traffic Signals, State Buildings and Public Universities, and Water Wastewater
 - Tasks were to measure and verify demand and energy reductions, determine how much the peak load reductions cost, audit performance of administrators, verify persistence of verified demand and energy savings
- ◆ Christensen, Assoc. was hired to independently evaluate Real Time Meter Program element



Monica Rudman, Figure 18

Nexant's Impact Verification Methodology

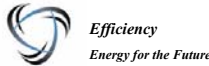


PLRP Savings Goals and Accomplishments (Cumulative to December 31, 2002)

Program Element	Funding Source	Total Demand Reduction Goal by 6/1/03 (MW)	Total Demand Reduction Contracted (MW)*	Program Administrator Demand Reduction Reported Installed (MW)	Preliminary Verified Savings (MW)	Preliminary Realization Rate
Agriculture	SB 5X	86.7	78.9	49.9	NA**	NA**
Cool Roofs/ Cool Savings	AB 970 & SB 5X	40	19.3	11.5	11.0	96%
Demand Response***	AB 970 & SB 5X	214	258.7	225.4	205.8	91%
ECAA Loans	AB 29X	50	13.6	11.3	NA**	NA**
Innovative	AB 970 & SB 5X	152	212.9	140.0	135.8	97%
LED Traffic Signals	AB 970	10	7.1	7.0	6.6	94%
State Buildings	AB 970	50	53	57.1	51.2	90%
Water Agency/ Wastewater	AB 970 & SB 5X	50	73.1	62.8	52.2	83%
Totals		652.7 MW	716.6 MW	565.0 MW	462.6 MW	

Program Element Cost-effectiveness for Projects with Completed M&V Analysis (cumulative to December 31, 2002)

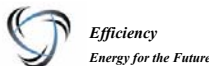
Program Element	Invoiced Amount (\$)*	Verified Savings (MW)	Preliminary Simple Cost Effectiveness (\$/ kW)	Preliminary Levelized Cost Effectiveness (\$/kW-yr)
Agriculture – SB 5X	\$10,576,053	53.4**	\$198	\$47
Cool Roofs – AB 970	\$3,557,854	5.38***	\$665	\$79
Cool Savings – SB 5X	\$4,032,285	6.40***	\$629	\$75
Demand Response – AB 970	\$8,379,738	102.1	\$82	NA
Demand Response – SB 5X^	\$13,391,420	103.7	\$129	NA
ECAA Loans – AB 29X	\$1,285,606	0.39	\$124	\$23
Innovative – AB 970	\$5,410,940	31.1	\$174	\$25
Innovative – SB 5X	\$23,203,416	104.7	\$222	\$29
LED Traffic Signals^^ – AB 970	\$10,811,147	6.34	\$1,707	\$369
State Buildings** – AB 970	\$4,956,575	51.2	\$97	\$44
Water/ Wastewater – AB 970	\$5,060,688	45.1	\$112	\$30
Water Agency Generation – SB 5X	\$2,181,220	5.8	\$374	\$45



Monica Rudman, Figure 21

Conclusions

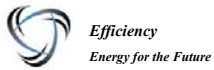
- ◆ Market response was exceptional
- ◆ Evaluation of the administrative process indicated that compliance with program guidelines, record keeping, and reporting requirements was very good or excellent in all program elements
- ◆ A survey of market participants revealed a high degree of satisfaction program element features, guidelines and administration



Monica Rudman, Figure 22

Summary

- ◆ In contracting for more than 700 MW of peak power reductions the Energy Commission successfully achieved 110 percent of its two year goal.



Monica Rudman, Figure 23