

Energy Efficiency in California – The Number One Resource

Maine Public Utilities Commission's Energy Forum:
Energy Efficiency Programs – a National Perspective



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Commissioner Susan Kennedy

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Energy Efficiency Philosophy and Facts

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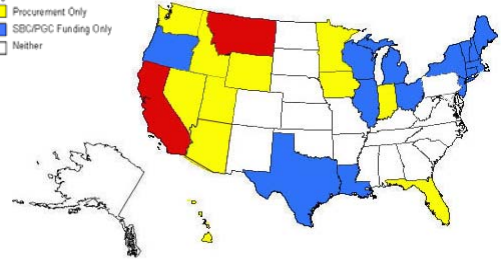
Energy Efficiency is Not a Social Program – it's a Resource

- Generation Benefits:
 - Both capacity and energy savings
 - Lowers fuel supply and fuel costs
 - Benefits in real-time and through deferred investment
 - Reduces required reserves
- Transmission and distribution benefits:
 - Deferral of new investment
 - Line loss reductions
 - Improved reliability
- Many states are investing in efficiency, but missing out on full potential of Integrated Resource Planning

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Energy Efficiency Programs and Funding Arrangements

- Procurement and SBC/PGC
- Procurement Only
- SBC/PGC Funding Only
- Neither



Sources: ACEEE and NRDC

Energy Efficiency: the Facts

- Efficiency is the most cost-effective option for meeting growing demand
- Improvements in forecasting and evaluation, measurement and verification (EM&V) make efficiency a very **reliable resource**
- Disincentives can be removed through regulatory changes - *Decoupling*
- **The Bottom Line:** with rising fuel costs, pervasive environmental externalities, and growing demand, we can't afford not to invest in efficiency

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The California Story...

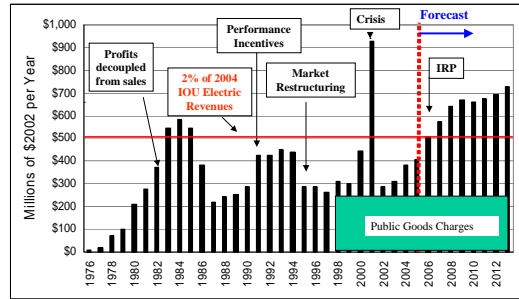
- Efficiency programs over last decade have provided **net benefits** of appx. **\$3.4 billion** to California's economy
- Efficiency and conservation messaging played a **crucial** role in mitigating the effects of the energy crisis in 2001
 - Cut demand by nearly 5000 megawatts off peak
- Lessons learned from the crisis and past experiences with Energy Efficiency
 - Energy Efficiency is a tangible resource
 - There is massive, untapped potential for efficiency
 - Success should be measured by energy savings, not by how much we spend.

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Energy Efficiency: The Numbers

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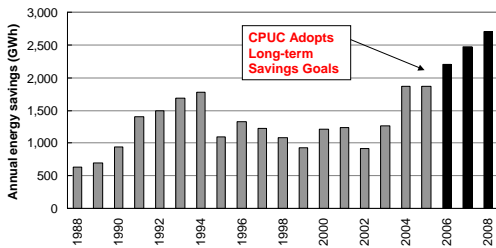
California IOU's Investment in Energy Efficiency



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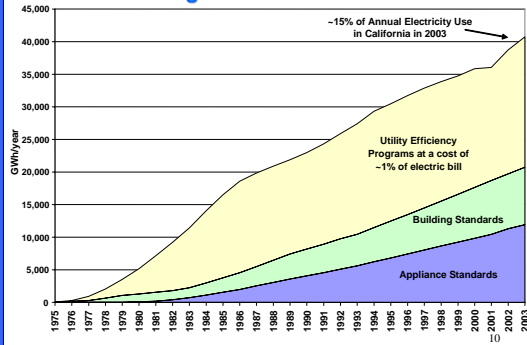
California Commits to Long-Term Efficiency

California IOU Historical and Projected Electric Efficiency Savings



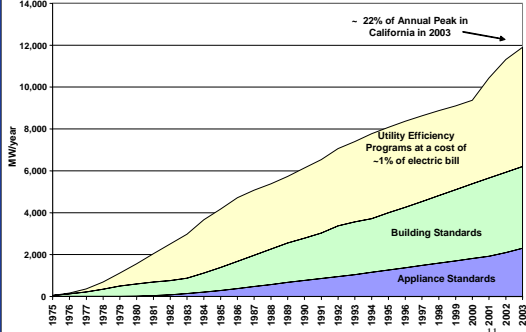
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Annual Energy Savings from Efficiency Programs and Standards



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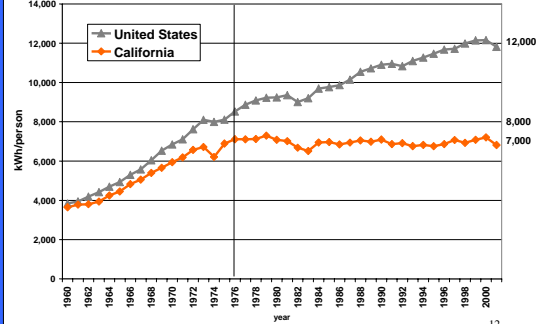
Annual Peak Savings from Efficiency Programs and Standards



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Per Capita Electricity Consumption

Source: http://www.eia.doe.gov/emeu/states/sep_use/total/csv/use_csv



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Regulatory and Policy Tools for Energy Efficiency

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Energy Action Plan State Policy

Priorities for Resource Acquisition

1. All Cost-Effective Energy Efficiency
2. Renewable Energy
3. Distributed & Self-Generation,
4. Conventional Generation & Transmission

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Energy Action Plan Energy Efficiency Goals (2004 – 2013)

- Utilities directed to achieve a 1% per capita per year energy reduction
- Saving targets for electricity (2004-2013)
 - 26,506 GWh out of approx. 250,000
 - 5,000 MW off peak
- 55% to 59% of IOUs' incremental electric energy needs over 10 years
- Most aggressive goals in the nation

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Recent Energy Efficiency Decision – 2006/2008 Program Funding

- Single largest efficiency and conservation campaign in US history
- California electric and natural gas utilities will invest \$2 billion in 2006-2008 in efficiency to help Californians reduce their energy bills
- **Avoid building three large (500 MW) power plants** because of this campaign
- Equivalent to taking 650,000 cars off the road
- **Net resource benefits** (value of savings benefits minus program and customer out-of-pocket costs) from programs implemented during 2006-2008 are estimated **\$2.7 billion**, representing a 2 to 1 return on the efficiency investment

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Keys to Energy Efficiency

- Decoupling: Remove utility disincentives to invest in efficiency
- Integrated Resource Planning: Integrate energy efficiency into resource procurement
- EM&V: Develop robust procedures for Evaluation, Measurement, and Verification
- Incentives: Create financial incentives to encourage IOU investment in efficiency
- Statewide Marketing and Outreach/Consumer Education

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The History of Decoupling in California

Electric Revenue Adjustment Mechanism

- In 1982, the CPUC Adopted ERAM to:
 - Decouple utility revenue from sales
 - Remove disincentives for energy efficiency and conservation
- Required utilities to track difference between actual and forecasted base rate revenues
 - Overcollections refunded to ratepayers
 - Undercollections recovered from ratepayer
- Allowed utilities to recover revenue requirement independent of actual sales

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Elimination of ERAM - 1996

- “Introduction of competition for generation will render ineffective the CPUC’s past approach of supporting Demand Side Management by using ERAM to counter the utility’s economic incentive to increase sales.”²
- General belief that there was no reason to worry about utilities’ energy efficiency incentives since they would transfer resource management responsibilities to unregulated participants in wholesale and retail electricity markets.

²CPUC, D.96-12-077

Post-Restructuring - 2001

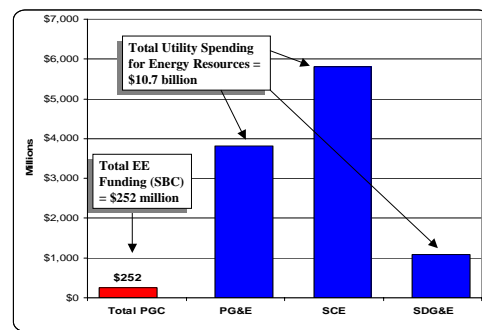
- Energy crisis reaffirmed need to have utilities play a role in portfolio management
- The Legislature, through AB29X, made the CPUC “ensure that errors in estimates of demand elasticity or sales do not result in material over or undercollections of the electrical corporations.”³
 - Ruled out any rate indexing that tied earnings to sales fluctuations
 - Provided utilities with assurance of cost recovery for authorized revenue requirements

³Public Utilities Code Section 739.10

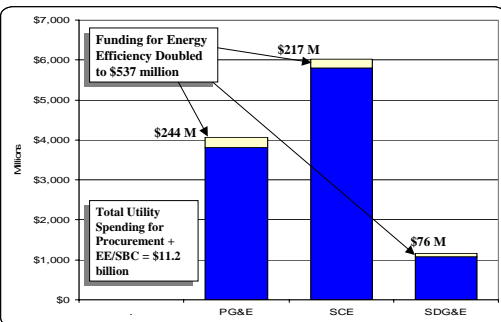
Integrated Resource Planning: *The Untapped Potential of Energy Efficiency*

- Cost-effective energy efficiency is widely available
- System Benefits Charges alone do not capture the full potential of energy efficiency
 - set artificial limits on savings potential
- Integrated Resource Planning creates additional funding

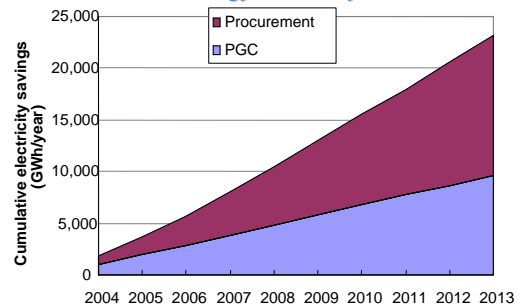
Energy Efficiency Funding by SBC Compared with Total Procurement Costs (2005)



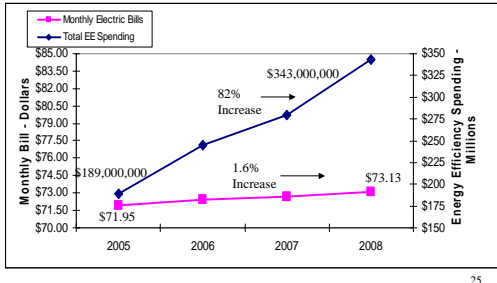
Energy Efficiency Funding Integrated with Energy Procurement (2005)



IRP Creates Additional Savings For Energy Efficiency



Increase EE Funding - Minimal Impact to Customers - PG&E



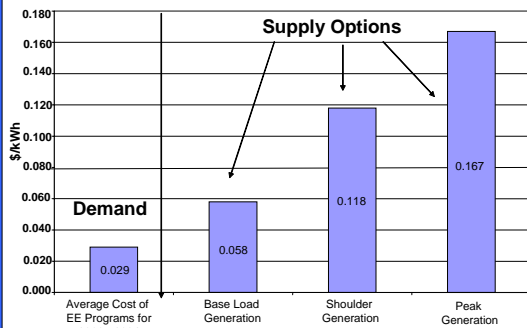
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Bill Impact Resulting from IRP and Increases in Efficiency Funding

- The preceding slide doesn't tell the whole story of the net impact of efficiency
- Over time, \$2.7 billion in net benefits will translate to lower revenue requirements and **decreased** average customer bills, despite slight increases in rates
- Investments in efficiency will yield substantial benefits in the long term, including reduced average bills

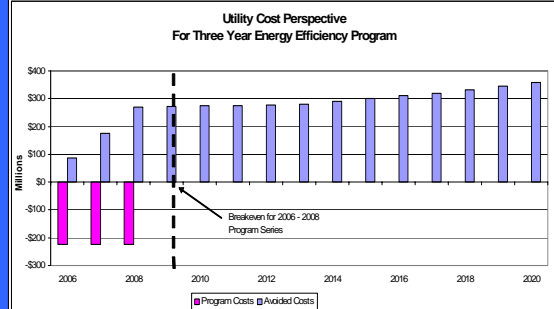
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Comparison of EE Program Costs to Supply Generation Costs



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Annual Cost-Benefit for Energy Efficiency Programs (SCE)



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Examples of Energy Efficiency Programs

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Residential Programs

- **Energy Efficiency Rebates**
 - Designed to encourage energy efficiency on a "whole house" basis. Provides rebates directly to customers who install specific efficiency measures including furnaces, energy-efficient water heaters, wall and attic insulation, high performance dual pane windows, whole-house fans, and more.
 - Point of Sale rebates and E-rebates or mail-in
- **Multifamily Energy Efficiency Rebate Program**
 - Focuses on apartment buildings with five or more units, as well as common areas and mobile home parks. Range of energy efficiency measures are covered include: ceiling fans with compact fluorescent lights, interior hardwired fluorescent fixtures, clothes washers, boiler/hot water heater controllers, thermostats, attic insulation, high efficiency windows, and more..
- **Energy Efficiency Surveys**
 - Provides information at no charge to help customers learn how to control and reduce energy usage. Surveys will be delivered through several different channels - internet, CD ROM

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On-Bill Financing

- Allows small businesses to borrow funds from their utilities to use for investment in energy efficiency
 - Loans require little paperwork and minimal interest
 - Energy efficient improvements require no up-front investment by small businesses, as loans are paid back on the utility bill itself over a two-year period with savings from energy efficiency
 - After the two-year payback period, businesses see a return on their investment in the form of lower bills due to reduced energy usage

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Local and State Government Partnerships

- Utility objectives for Partnerships include:
 - Increased reach and effectiveness of DSM programs
 - Take advantage of existing government infrastructure to successfully implement programs and projects
- Government objectives for Partnerships include:
 - Gaining the ability to provide specialized energy efficiency offerings to their local communities
 - Informing local communities about the wide variety of energy efficiency and demand reduction offerings available and encouraging participation

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Education, Training, and Outreach

- Promotes energy efficiency and demand response to all market segments through energy centers, technology test centers, and other information and training program strategies:
 - Energy audits for nonresidential customers
 - Energy Management Surveys for residential customers
 - Expanded on-line design resources for industrial, agricultural, residential, and commercial buildings
- Statewide Marketing and Outreach will continue with the Flex Your Power campaign – www.fypower.org

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Energy Crisis: Efficiency and Conservation were Critical Tools

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California 2001: The Perfect Storm

- Energy demand increased by 13% (1988-1998)
- Generation capacity declined by 5% (1988-1998)
- Available imports declined
 - Drought conditions
 - Population growth throughout the Western US
- Flawed deregulation plan

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Outlook for Summer 2001

- Peak demand could be short by 5,000 MW (CA Energy Commission)
- 34 days of blackouts expected - financial cost of \$16 Billion (California Independent System Operator)
- More than 700 hours of rolling blackouts expected (North American Electric Reliability Council [NERC])

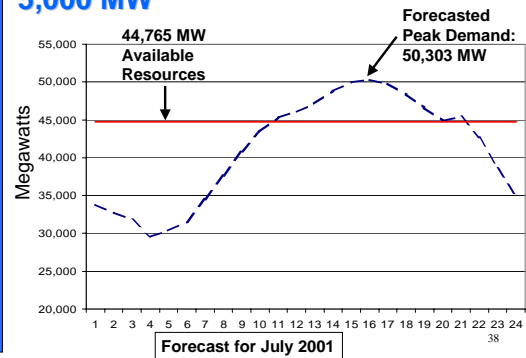
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The Emergency Plan

- Stabilize the electric utilities financially
- Emergency program for building power plants
- Emergency campaign for energy conservation

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DSM Goal: Reduce Peak Demand by 5,000 MW



Customer Research

Customer Research concluded that instructions to people had to be:

- Easy to understand
- Consistent
- Repetitive

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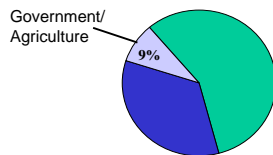
Three Specific Actions Needed

The Message:

- Set air conditioners to 78°F
- Use major appliances after 7pm
- Turn lights off when you leave a room

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Government & Agriculture Sector



- Most immediate access to MW savings because **under our control**
- Government must **lead by example**

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State Buildings

Objective: Establish communications network with state agencies, departments, universities, and building managers

Strategy: Designate an **Energy Conservation Coordinator** for all state buildings and programs

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State Building Energy Conservation Coordinators - Responsibilities

1. Turn off all non-essential lighting
2. Set interior temperature levels to 78°F
3. Turn off all non-essential office equipment during peak hours
4. During '**Energy Alerts**' (operating reserves fall below 7%) all work not necessary to protect public health and safety stopped

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Results - Government & Agriculture Initiative

- State government reduced electricity usage by **23%** in 2001
- **285 MW** of peak demand reduced
- **Energy Alerts** reduced demand an additional 100 - 200 MW

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State Agency Outreach & Education Campaign

Identified all contacts with businesses and the public through every possible channel:

- Business licenses
- Vehicle registrations
- Websites
- Newsletters
- Tax notices
- Welfare checks
- Health care assistance
- Unemployment and disability assistance

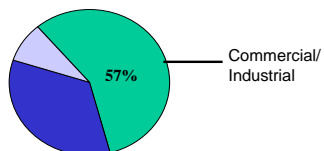
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Results - Informed Millions

- 19 million vehicle owners and 8 million drivers who applied for or renewed licenses
- 1 million tax notices
- 900,000 businesses contacted via the Employment Development Department newsletter

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Commercial and Industrial Sector



- **Challenge:** The most important in terms of potential energy savings
- 57% of California's electricity consumption
- No built-in network to communicate as with State government

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Outreach Through Business & Industry Associations

- **California Chamber of Commerce** - represents banks, manufacturers, and hotel chains
- **California Retailers Association** - represents thousands of department stores, clothing stores, pharmacies and restaurants like McDonald's
- **California Grocers Associations** - represents large food market
- **Silicon Valley Manufacturers Group** - represents hundreds of high-tech companies in Silicon Valley

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Individual Business Leaders Pledge Action

1,300 CEOs agree to:

- Appoint an **Energy Conservation Coordinator** for each of their facilities
- Distribute conservation brochures to all their employees
- Set air conditioners at 78°F at all facilities
- Reduce their lighting by 25% immediately, and reduce another 25% during an **Energy Alert**

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Partnership Between Labor Unions & Building Owners

- 300 million square feet of commercial office space covered
- 2 million workers covered
- Janitors trained to
 - shut off unnecessary lights and computers,
 - check air conditioner level, and
 - look for energy savings opportunities

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Retailers Reached Out to Customers

- McDonald's: conservation message placed on **4 million tray liners** in 1,100 restaurants
- 3,000 food stores distributed **13.5 million** conservation brochures to customers

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Retailers Reached Out to Customers

- Appliance stores
 - Offered special promotions,
 - Educated customers, and
 - Offered state-funded rebates on energy efficiency appliances

One appliance company distributed 37 million conservation brochures to customers

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Commercial & Industrial Results - Summer 2001

- 27% of businesses **reduced** electricity usage **by at least 20%** - some businesses reduced usage by as much as 40%
- Commercial sector **reduced** peak consumption by **1,982 MW** - a 14% reduction

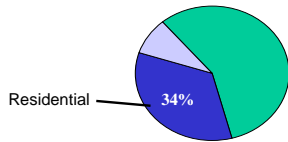
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Commercial & Industrial Results - Summer 2001

- Industrial sector **reduced** peak consumption by **810 MW** - a 9.3% reduction
- State-funded rebate programs in coordination with advertising **resulted in sales increases** ranging from **50% to 400%**

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Residential Sector



Concentrated on two fronts:

1. Media advertising
2. Contacting customers through electric utilities

Same Message:

- Set air conditioners to 78°F
- No major appliances until after 7pm
- Lights out in every room

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Media Advertising Campaign

- Television
- Radio
- Newspapers
- Outdoor advertising

• Results

- 95% penetration rate among adults and teens
- 67% recall of the advertisements
- 53% could correctly recite the instructions in the ads

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Contacting Customers Through Electric Utilities

- Conservation message included in utility bills
- **20/20 Program**
 - 20% decrease in electric use resulted in additional 20% reduction in bill

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Residential Sector Results - 2001

- 33% of the utilities' residential customers reduced energy consumption by 20%
- Reduced peak consumption by 2,312 MW - a 16.9% reduction off projected levels

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Results – All Sectors

- The three sectors combined reduced peak electric usage by a total of **5,570 MW** – exceeding our original goal

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2001 Energy Savings By Sector, Source and Initiative

Sector	Sector %	Sector MW	Efficiency MW	Conservation MW	Total MW
Residential	34.5	13,666	494	1,818	2,312
Agriculture/ Government	8.4	3,328	228	238	466
Commercial /Industrial	57.2	22,619	385	2,407	2792
Totals:	100	39,613	1,107	4,463	5,570

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Permanent Investment in Energy Efficiency

- Replaced old lighting with energy-efficient lighting
- Retrofitted Heating, Air-Conditioning and Ventilation (HVAC) units
- Installed demand-managing systems such as motion-sensitive lighting in offices
- Retrofit agricultural water pumps

Result: 1,100 MW of permanent savings created in 2001

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Building Standards

California adopted the strongest building standards in the US – June 2001

- Increased emphasis architects and builders must place on:
 - Air conditioning units
 - Heating ducts
 - Insulating windows and attics

Result:

- An additional 200 MW in savings per year
- Savings to increase to 1,000 MW per year by 2006

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