Energy Efficiency in California – The Number One Resource

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

Brian C. Prusnek -- Chief of Staff to 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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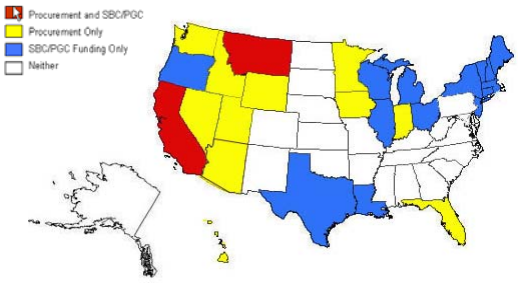
Energy Efficiency Programs and Funding Arrangements



Sources: ACEEE and NRDC

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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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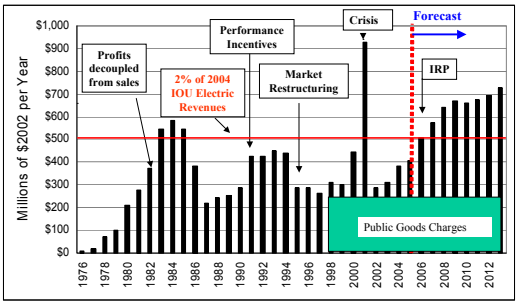
California IOU's Investment in Energy Efficiency



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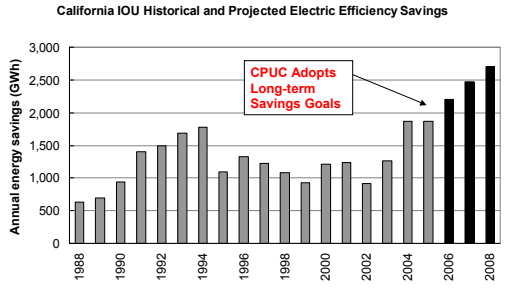
California Commits to Long-Term Efficiency



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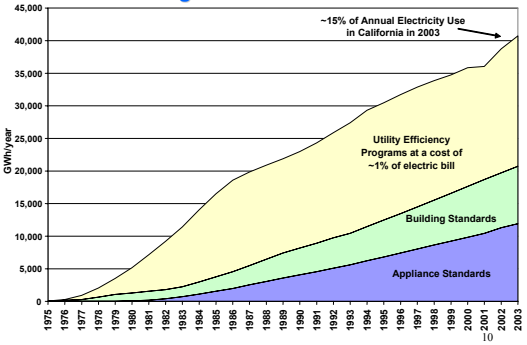
Annual Energy Savings from Efficiency Programs and Standards



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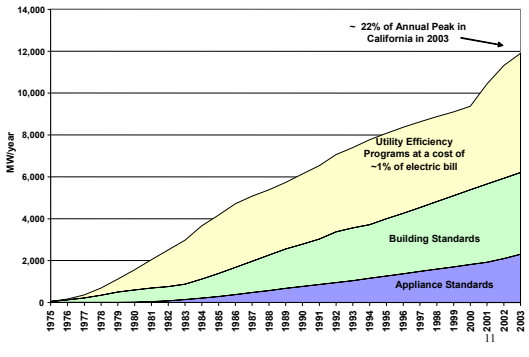
Annual Peak Savings from Efficiency Programs and Standards



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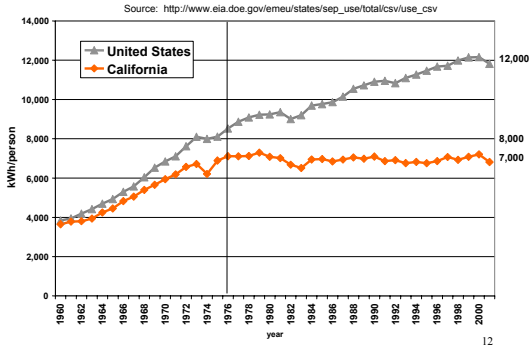
Per Capita Electricity Consumption

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.

[2]CPUC, D.96-12-077

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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

[3]Public Utilities Code Section 739.10

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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

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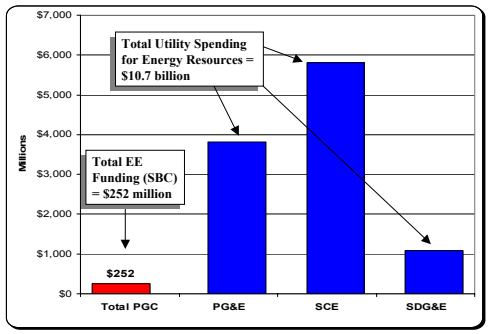
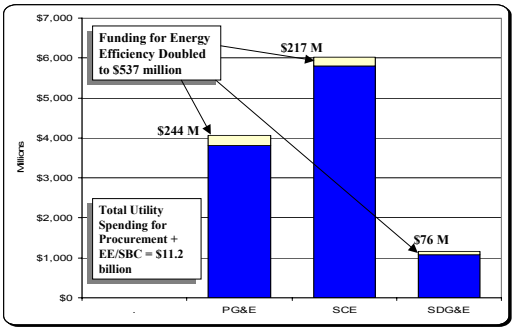
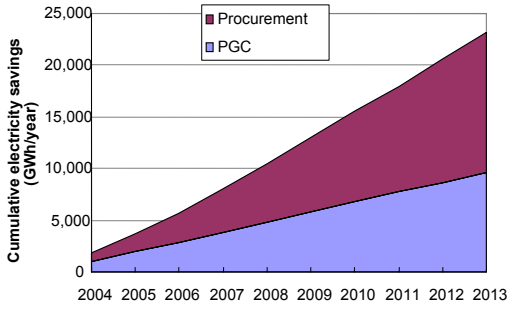
Energy Efficiency Funding by SBC Compared with Total Procurement Costs (2005)



Energy Efficiency Funding Integrated with Energy Procurement (2005)



IRP Creates Additional Savings For Energy Efficiency



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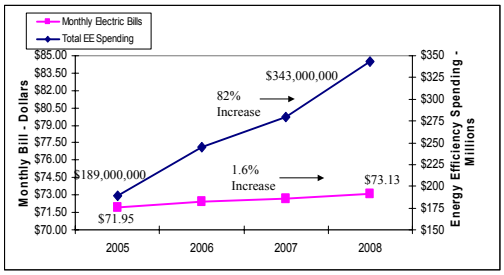
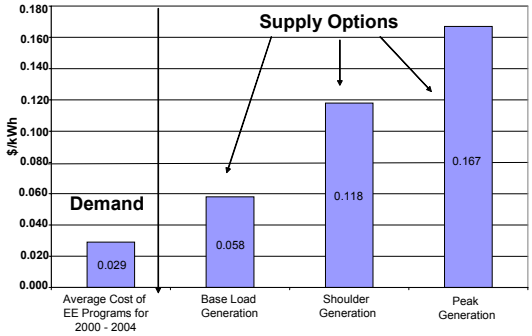
Increase EE Funding
- Minimal Impact to Customers -
PG&E



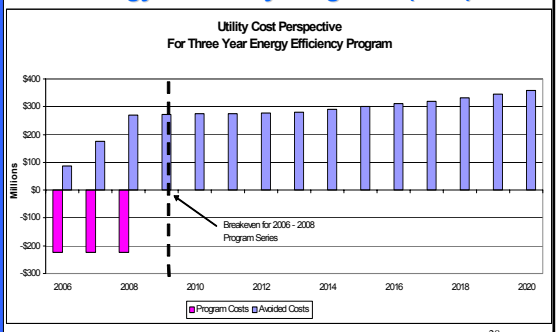
Bill Impact Resulting from IRP and Increases in Efficiency Funding

- 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

Comparison of EE Program Costs to Supply Generation Costs



Annual Cost-Benefit for Energy Efficiency Programs (SCE)



Examples of Energy Efficiency Programs

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

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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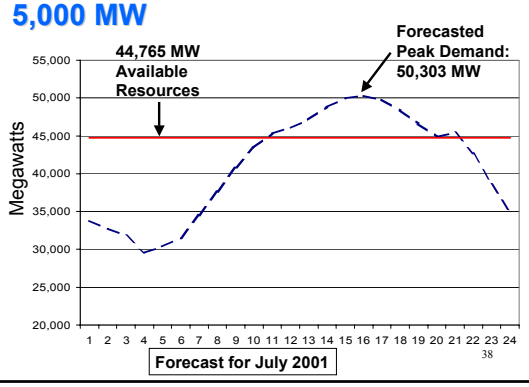
DSM Goal: Reduce Peak Demand by 5,000 MW



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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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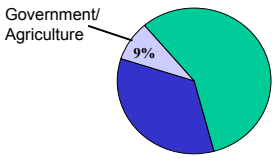
Government & Agriculture Sector



- 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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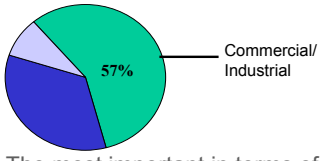
Commercial and Industrial Sector



- **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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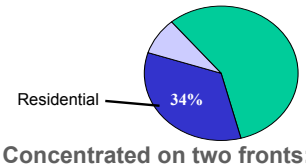
Residential Sector



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	Conser-vation 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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