

# ACEEE National Conference on Energy Efficiency as a Resource

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## Energy Efficiency as a Resource at the Sacramento Municipal Utility District

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## Overview

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- SMUD Profile
- Impacts of the Energy Crisis
- Actions Taken as a Result of the Energy Crisis
- Demand Reducing Programs
- Program Results
- Program Direction



## SMUD Profile

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- Electric utility with a 900 square mile service territory
- Governed by seven member Board of Directors elected by voters
- Revenues of \$767 M in 1999, \$939 M in 2000, \$1.5 B in 2001, \$994 M in 2002
- 2,000+ employees
- Summer peak - 2779 MW (7/10/02)



## -Deregulation-

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“You don’t know how bad you’ll fail unless you try!”

-Homer Simpson



## Impacts of the Energy Crisis

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- Rolling blackouts
- High energy prices—to utilities & customers
- Significant increase in energy awareness
- Increased demand for energy efficiency & load management programs



## Actions Taken as a Result of the Energy Crisis

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- After 10 years without a rate increase, SMUD increased rates
  - 13% to 19% increase for residential
  - 18% to 25% for commercial/industrial
- Increased energy efficiency activities
  - SMUD Board approved additional \$1.5 million for EE
  - Received \$9.7 million from CEC (SB5X & AB970)



## Actions Taken as a Result of the Energy Crisis

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- Increased load management efforts
  - \$2.85 million allocated by CEC to demand responsive programs
  - PowerNet and PowerDirect—demand-responsive programs funded by the CEC
  - Pilot residential programs
  - Increased participation in Voluntary Energy Curtailment Program (VECP)
- Constructing 500 MW natural gas-fired power plant at former nuke site



## Actions Taken as a Result of the Energy Crisis

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- Petitioned for and received approval to become our own control area
- Encouraged customers to reduce energy use
  - Customers cut use by 15% through non-permanent actions
  - Approximately 10% still continues



## Energy Efficiency as a Resource

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- SMUD is a summer-peaking utility
- SMUD generates approximately 50% of its power
  - Hydro (688 MW)
  - Cogeneration (380 MW)
  - Wind and PV (22 MW)
  - Other (50 MW)
- Remaining power is purchased through long- and short-term contracts and on the spot market



## Energy Efficiency as a Resource

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- Energy efficiency programs have always been viewed as a resource—
  - Reduces peak demand
  - Reduces need for purchased power
  - Cleaner
  - Customer benefits
    - Lower bills
    - Improved efficiency
    - Improved comfort



## Demand Reducing Programs Residential

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Energy Advisory	Pool & Spa
Equipment Efficiency	Solar DHW
Appliance Efficiency	Shade Trees
New Construction	Retail Lighting
Low Income Weatherization	



## Old Refrigerator Pickup & Recycling

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- Turnkey program
- 1,901 kW reduced
- 13,701 MWh saved
- 8,930 refrigerators recycled
- 563 tons of metal recycled
- 613 gallons of oil recycled
- 49,189 lbs of cfc-containing foam destroyed



## Demand Reducing Programs Commercial/Industrial

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- C&I New Construction
- C/I Retrofit Programs
  - Lighting and HVAC rebates
  - Resource Conservation Manager
  - Small C/I HVAC Tune-Up
  - Retrocommissioning
  - Building Operator Certification
  - Cool Roofs
  - Pump Testing



## Cool Roofs

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- Program started in early 2001 (prior to energy crisis) with CEC funding
- Rebate \$0.20/sf (\$0.15 CEC, \$0.05 SMUD) in 2001 and 2002
- Current rebate is \$0.10/sf for first 20k sf and \$0.05/sf thereafter
- 1,200 kW reduced (0.25W/sf)
- 720 MWh saved (0.15kWh/sf)
- 4.8 million square feet installed



## Retrocommissioning

- Program started in 1999
- SMUD paid commissioning agents \$25k to \$35k to review plans, analyze building control systems, observe energy-using equipment and make recommendations
- Building owners must be willing to contribute \$10k to \$20k for improvements
- 17 buildings retrocommissioned
- Savings ranged from 1.5% to 38% of total energy use



## SMUD's Public Goods Budget

	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>
Energy Eff	\$13.6	\$13.6	\$14.6	\$14.6	\$15.0
Renewables	\$ 3.6	\$ 3.3	\$ 3.2	\$ 3.2	\$ 3.3
RD&D	\$ 1.8	\$ 1.8	\$ 1.8	\$ 1.8	\$ 1.9
<u>Low Income</u>	<u>\$ 5.2</u>	<u>\$ 5.4</u>	<u>\$ 6.1</u>	<u>\$ 8.5</u>	<u>\$ 9.0</u>
<b>TOTAL:</b>	<b>\$24.2</b>	<b>\$24.2</b>	<b>\$25.7</b>	<b>\$28.1</b>	<b>\$29.2</b>



## Program Results

### Energy Efficiency Program Savings and Spending

	<u>MW</u>	<u>GWh</u>	<u>Budget</u>
•	10.0	29.8	\$14.4 M
•	17.6	63.4	\$16.9 M
•	21.6	69.4	\$20.6 M
•	15.4	41.7	\$17.1 M



## SB5X Programs and Results Through 2002

<u>Program</u>	<u>kW</u>	<u>MWh</u>	<u>\$ (k)</u>
Residential ac rebates	2,435	1,114	\$ 906
Refrigerator recycling	1,901	12,701	\$1,856
Large C/I lighting rebates	2,598	13,568	\$ 553
Large and medium cfl rebates	110	482	\$ 41
Small C/I lighting	2,034	6,356	\$1,247
Chiller/ac/process rebates	816	2,582	\$ 376
Vending Miser	349	5,481	\$ 629
Res new construction ac rebates	2,132	799	\$1,366
C/I New Construction HVAC	186	310	\$ 117
<u>Measurement and Verification</u>			<u>\$ 260</u>
<b>Totals</b>	<b>12,561</b>	<b>44,393</b>	<b>\$7,351</b>



## Load Management Programs

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<u>Program</u>	<u>MW Reduction</u>
Res ACLM	110 – 200 MW
CACLM	19 MW
VECP	45 - 75 MW
<u>PowerNet &amp; Power Direct</u>	<u>12 - 14 MW</u>
Total Ld Mgmt	186 - 308 MW



## Program Direction

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- Maintain focus of EE programs on peak period demand reduction
- Compare energy efficiency to other resources and work to procure additional EE funds and expand programs
- Continue participation with national and regional organizations and IOU's to—
  - Maintain statewide program consistency where possible
  - Promote national codes and standards
  - Stay apprised of new developments

