



# Retail Rate Options for Small Customers

**The California Statewide Pricing Pilot**  
**Why? ... What? ... The Future?**





## Two Objectives

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1

Summarize the most significant results from the California Statewide Pricing Pilot.

2

Identify how California is interpreting these results and what they mean for regulatory policy and demand response.



# Why ?

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- “ Why was there virtually no reduction in electricity peak demand from the customer side of the market when wholesale prices increased by a factor of five in less than a week in the summer of 2000? “ \****
- How do we solve outage management practices that exempt 50% of the utility customers?***
- How do you provide customers with the capability to better manage their electric bills and tailor reliability to their individual needs?***
- What can we do to turn demand response into a viable resource?***

\* CEC Action Plan, October 11, 2002



# The Problems

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*DR programs can be best characterized as patches to compensate for poor or ineffective rate design.*



## Price

Without basic price information customers do not have the capability to make rational investment or operating decisions.



## Rates

Customers don't understand their electric rates.



## Programs

Electrical system problems require that technologies and procedures be in place and instantly available – they weren't.



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# ***Statewide Pricing Pilot***

## **Results**



# Critical Design Features

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1. **Approximately 2,500 participating customers.**
2. **CPUC, CEC and CPA cooperative regulatory proceeding.**
3. **Complex experimental design – statistically representative.**
4. **SCE, PG&E and SDG&E cooperative joint-venture pilot.**
  - Revenue neutral rate designs.**
  - Rate treatments: (1) TOU, (2) CPP-F, (3) CPP-V.**
  - Technology and information treatments.**

# SPP Conclusions

## System Impacts

Residential CPP rates can, within five years of deployment reduce California's peak load by 1,500 to over 3,000 mW.

## Conservation and Peak Load Impacts

Dynamic rates encourage greater conservation and peak demand impacts than conventional inverted tier or time-of-use rates.

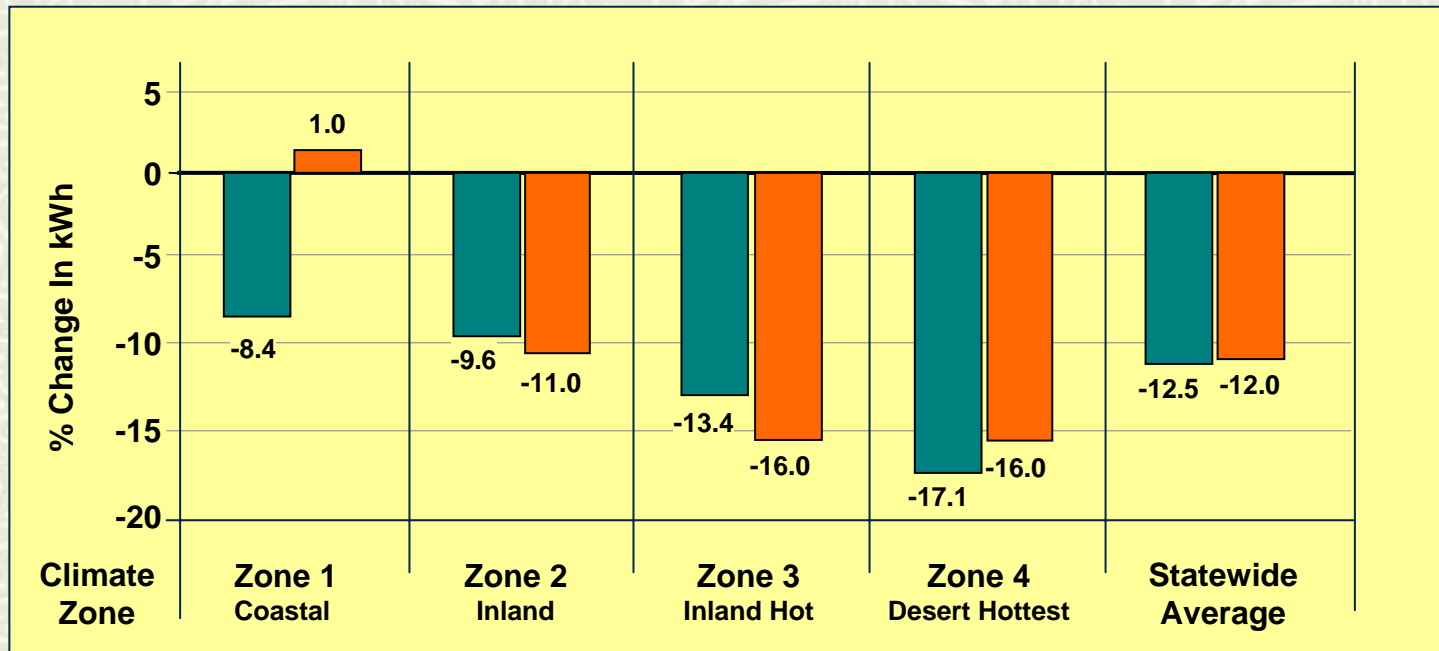
## Customer Acceptance

Residential and small to medium commercial and industrial customers understand and overwhelmingly prefer dynamic rates to existing inverted tier rates.

Source: CEC staff conclusions based on review of collective SPP reports.

# Residential Load Impacts (Weather)

## Percent Change In Peak Period Energy Use (CPP-F)



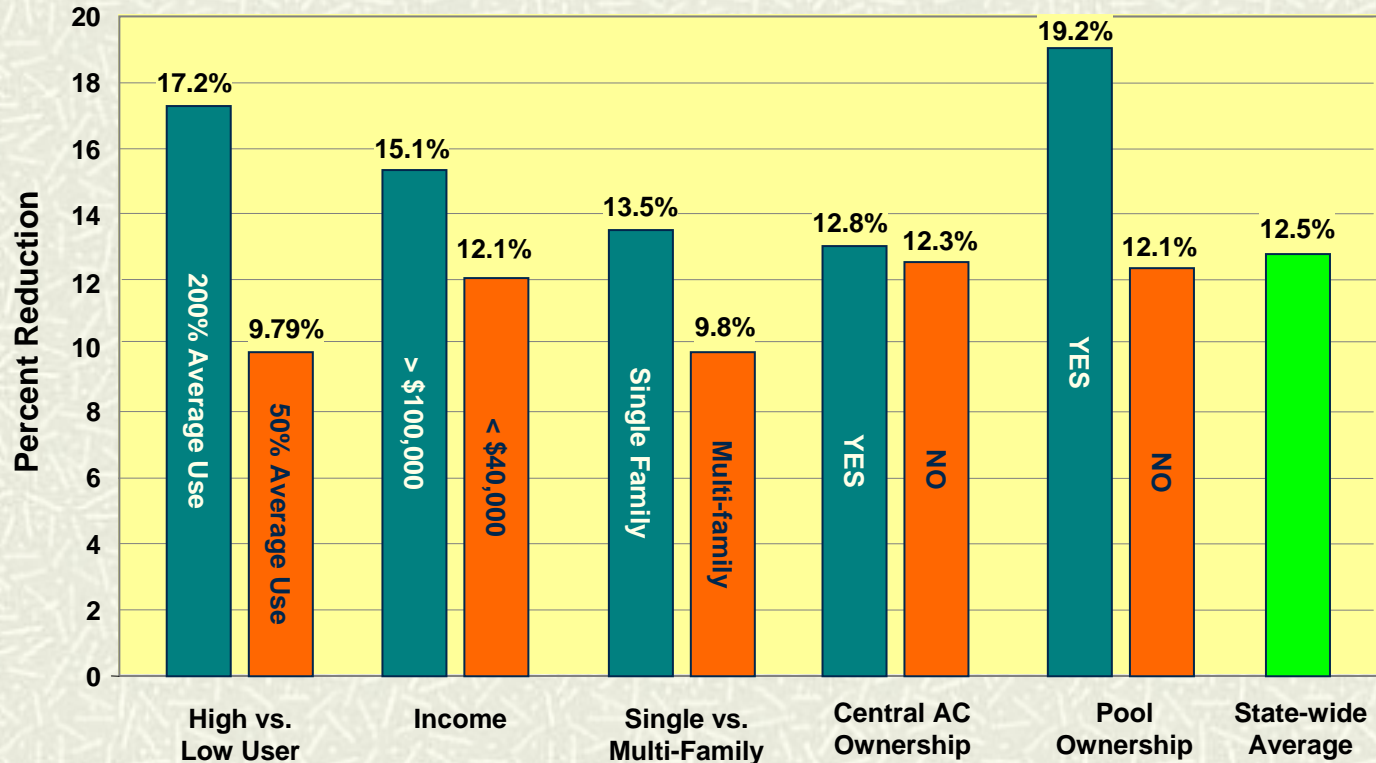
■ CRA Econometric Model

■ CEC Engineering Method

Source: Statewide Pricing Pilot, Summer 2003 Impact Analysis, Charles Rivers Associates, August 9, 2004, Table 5-4

# Residential Load Impacts (Demographics)

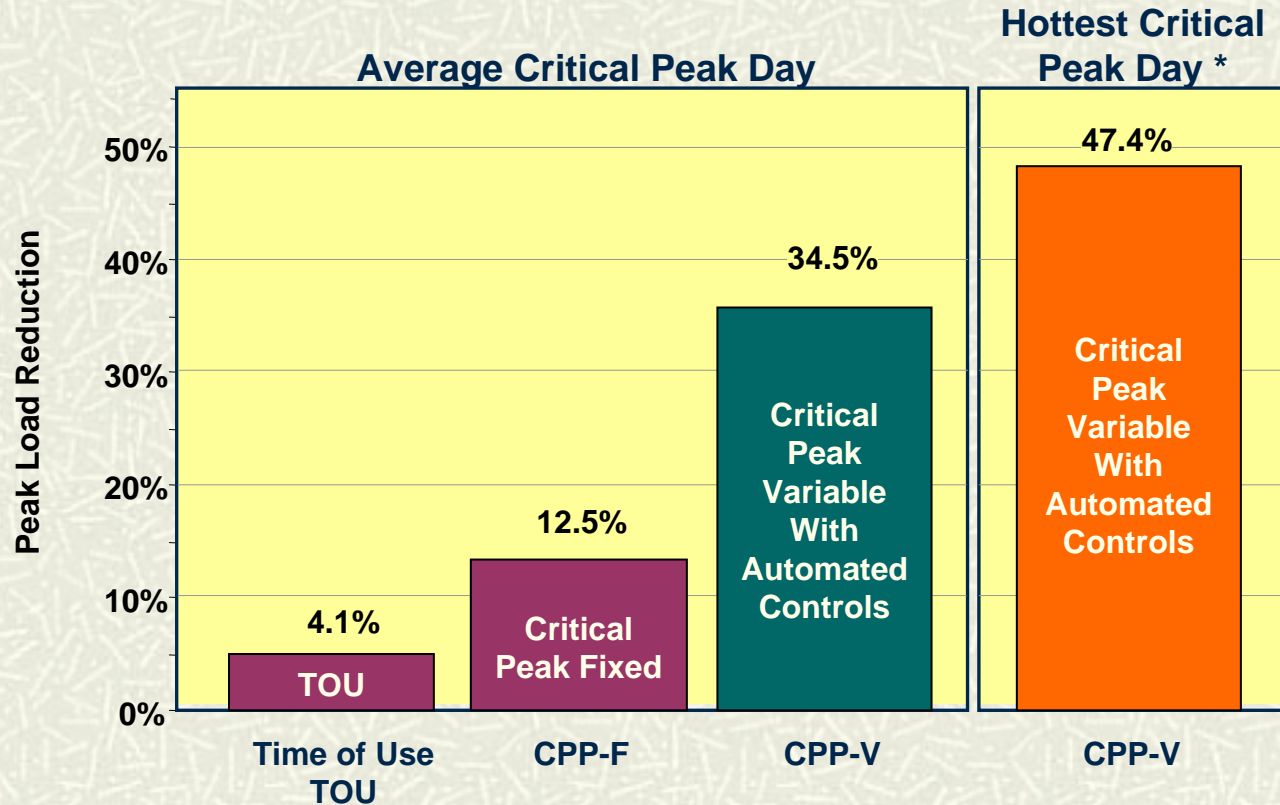
## Percent Reduction in Peak Period Usage (CPP-F)



Source: Statewide Pricing Pilot, Summer 2003 Impact Analysis, CRA, August 9, 2004, Table 5-9, p.90

# Residential Load Impacts (Technology)

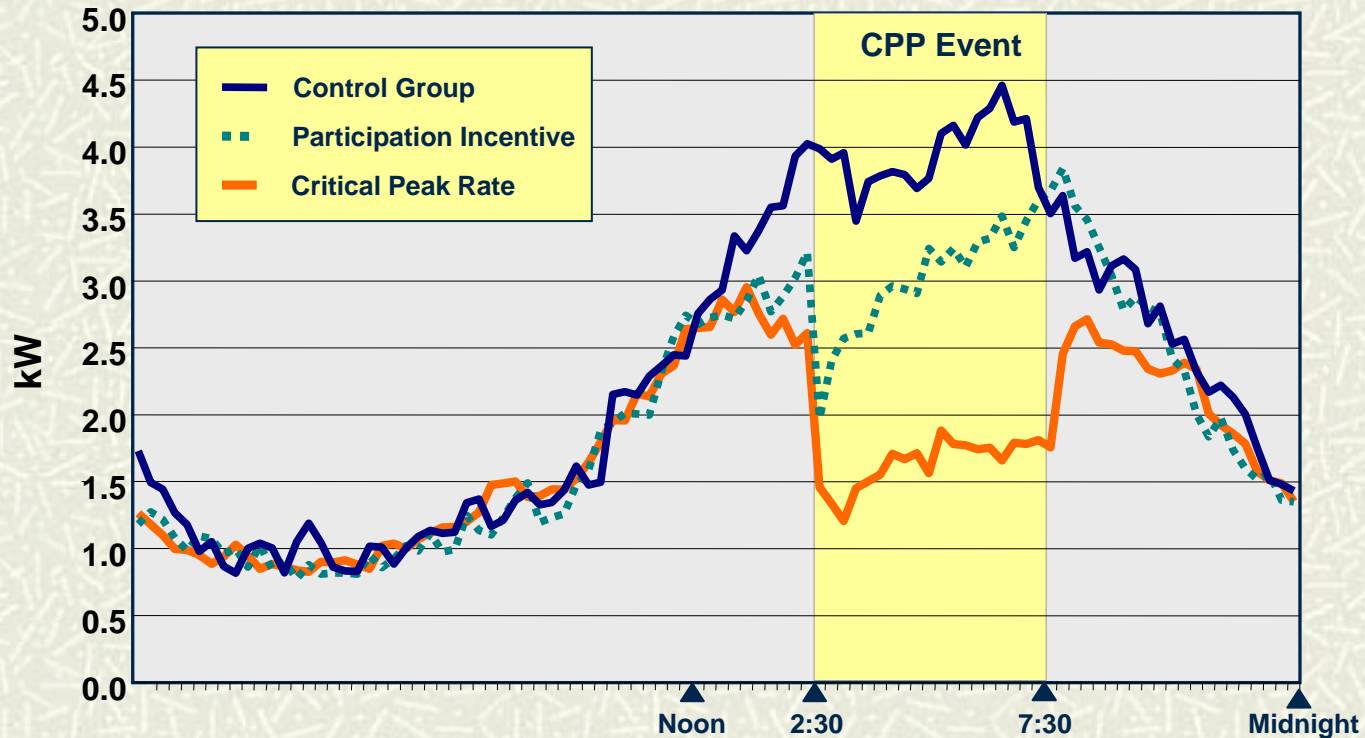
## Critical Peak Impacts By Rate Treatment



Source: Statewide Pricing Pilot Summer 2003 Impact Analysis, Charles Rivers Associates, Table 1-3, 1-4, August 9, 2004.

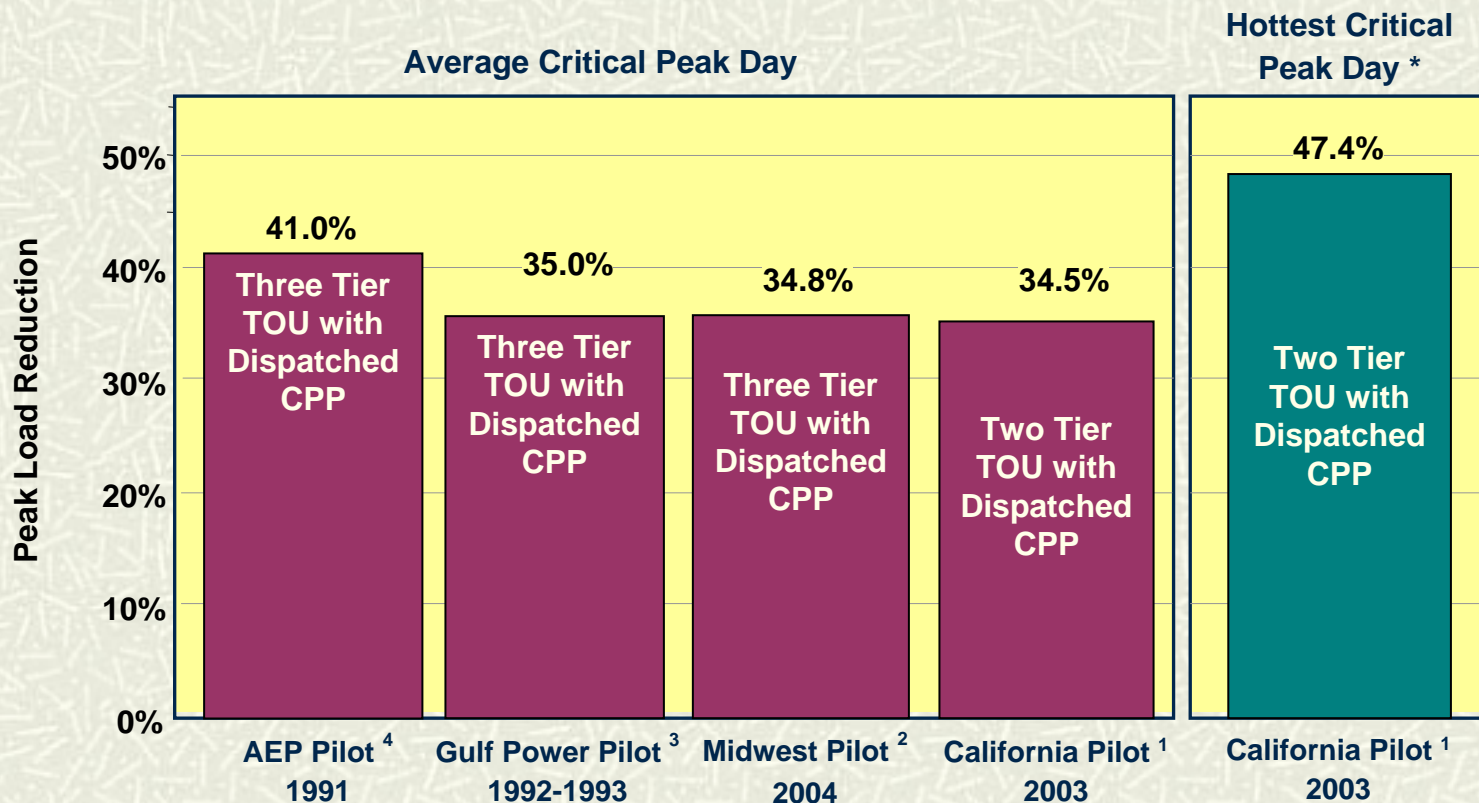
# Residential Load Impacts (Incentives)

## Residential Response with Automation: Participation Incentive vs. Critical Peak Rate



Hot Day, August 15, 2003, Average Peak Temperature 88.5°

# Residential Load Impacts (Historical Results)



Source:

1. Statewide Pricing Pilot Summer 2003 Impact Analysis, Charles River Associates, Table 1-3, 1-4, August 9, 2004. Hottest day impacts on page 105.
2. Private communication, residential TOU pilot study, May 2005.
3. Results of the Pilot Residential Advanced Energy Management System, Gulf Power, November 1994.
4. Levy Associates case study report, July 1994.

# Customer Bill Impacts (Actual)

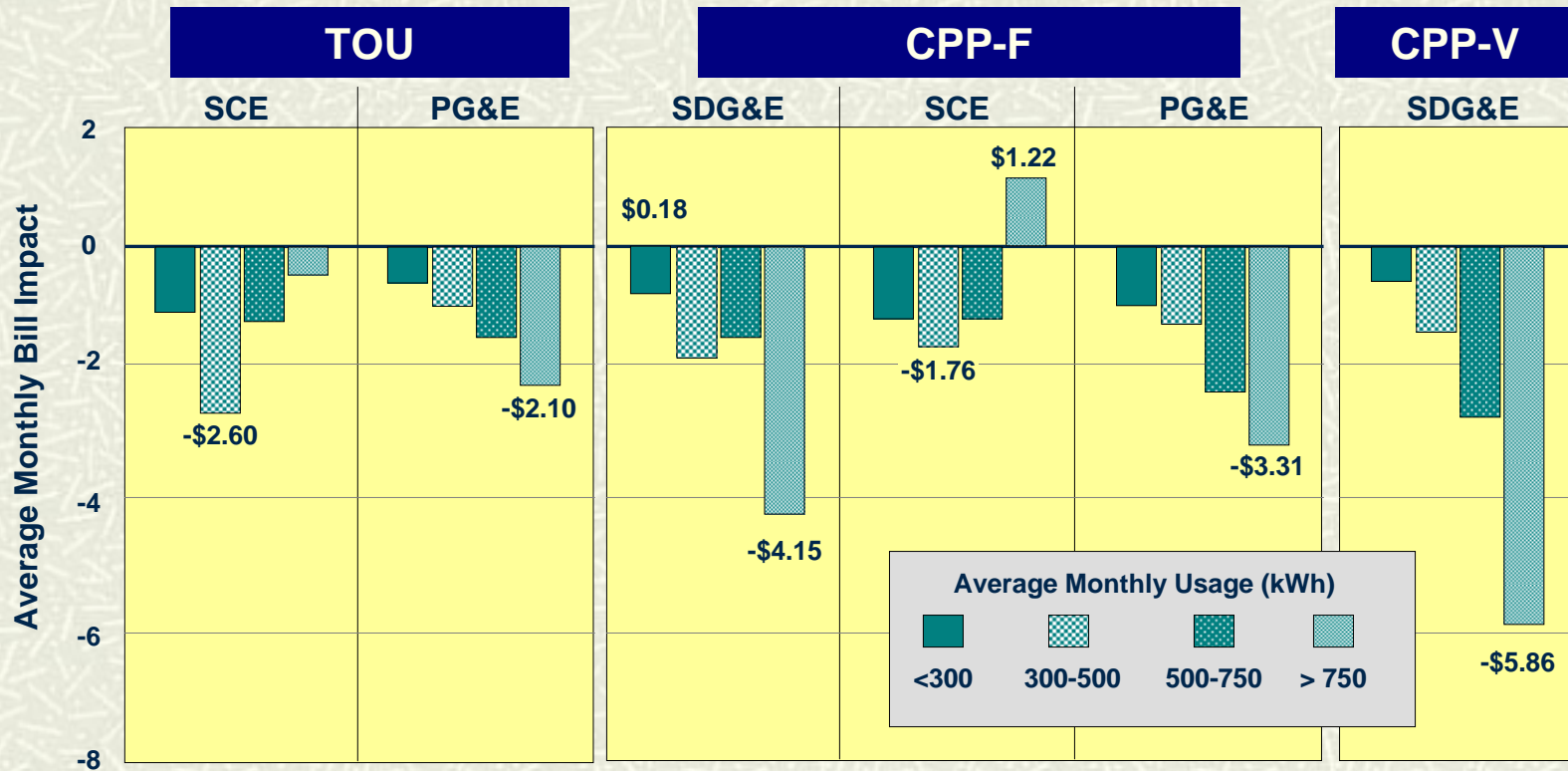
|                               |                               | Residential |        |        | Small-Medium Commercial |         |
|-------------------------------|-------------------------------|-------------|--------|--------|-------------------------|---------|
|                               |                               | CPPV        | CPPF   | TOU    | CPPV                    | TOU     |
| Customers With Bill Savings   | Participants (%)              | 71.1%       | 73.7%  | 70.0%  | 80.3%                   | 58.2%   |
|                               | Average Monthly Savings (%)   | 5.1%        | 5.5%   | 4.5%   | 12.2%                   | 9.6%    |
|                               | Average Monthly Savings (\$)  | \$6.81      | \$3.89 | \$3.25 | \$155.17                | \$90.65 |
| Customers With Bill Increases | Participants (%)              | 28.9%       | 26.3%  | 30.0%  | 19.7%                   | 41.8%   |
|                               | Average Monthly Increase (%)  | 4.0%        | 6.2%   | 3.0%   | 5.0%                    | 10.0%   |
|                               | Average Monthly Increase (\$) | \$5.03      | \$4.93 | \$3.32 | \$22.89                 | \$62.52 |

summer / winter 2003

Source: Statewide Pricing Pilot, Shadow Bill Results, WG3 report, June 9, 2004.

# Customer Bill Impacts (Actual by Utility)

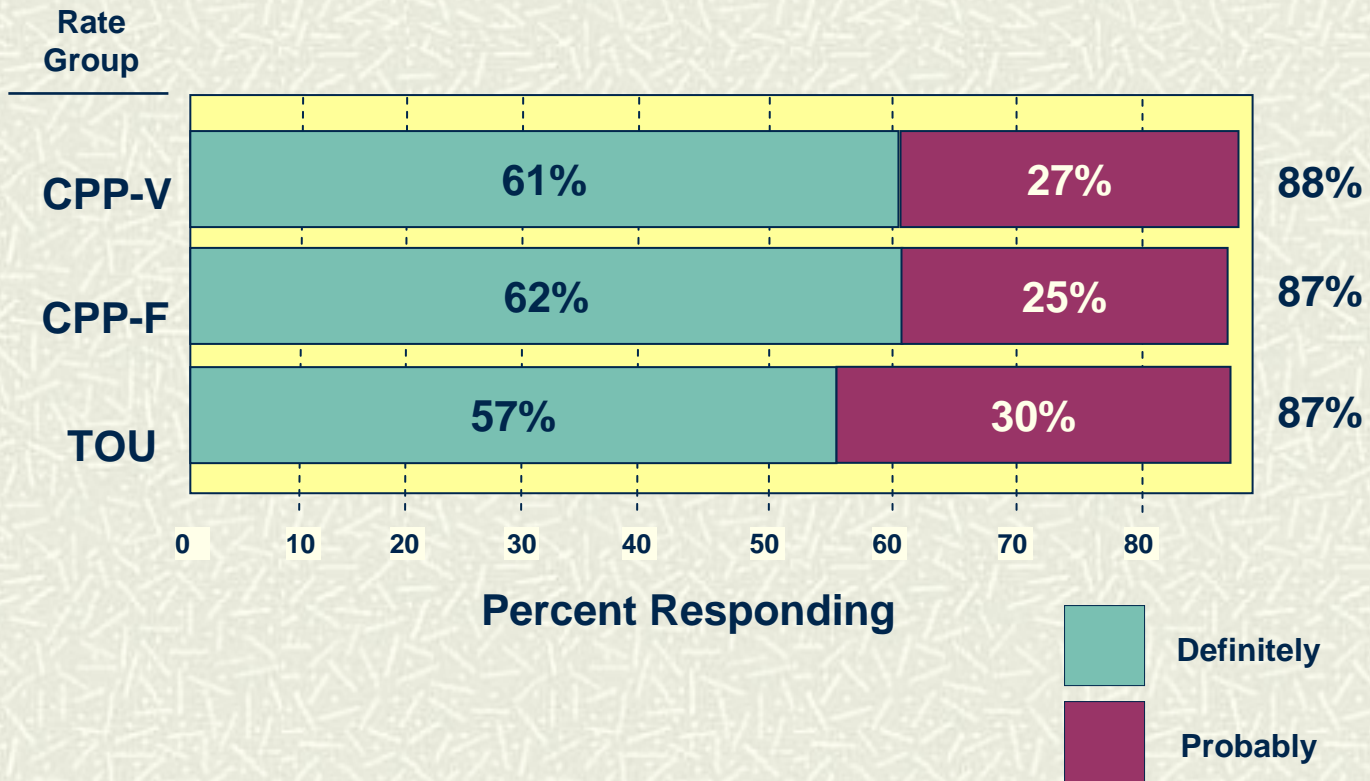
Change in Average Monthly Customer Bill, July 2003 thru May 2004



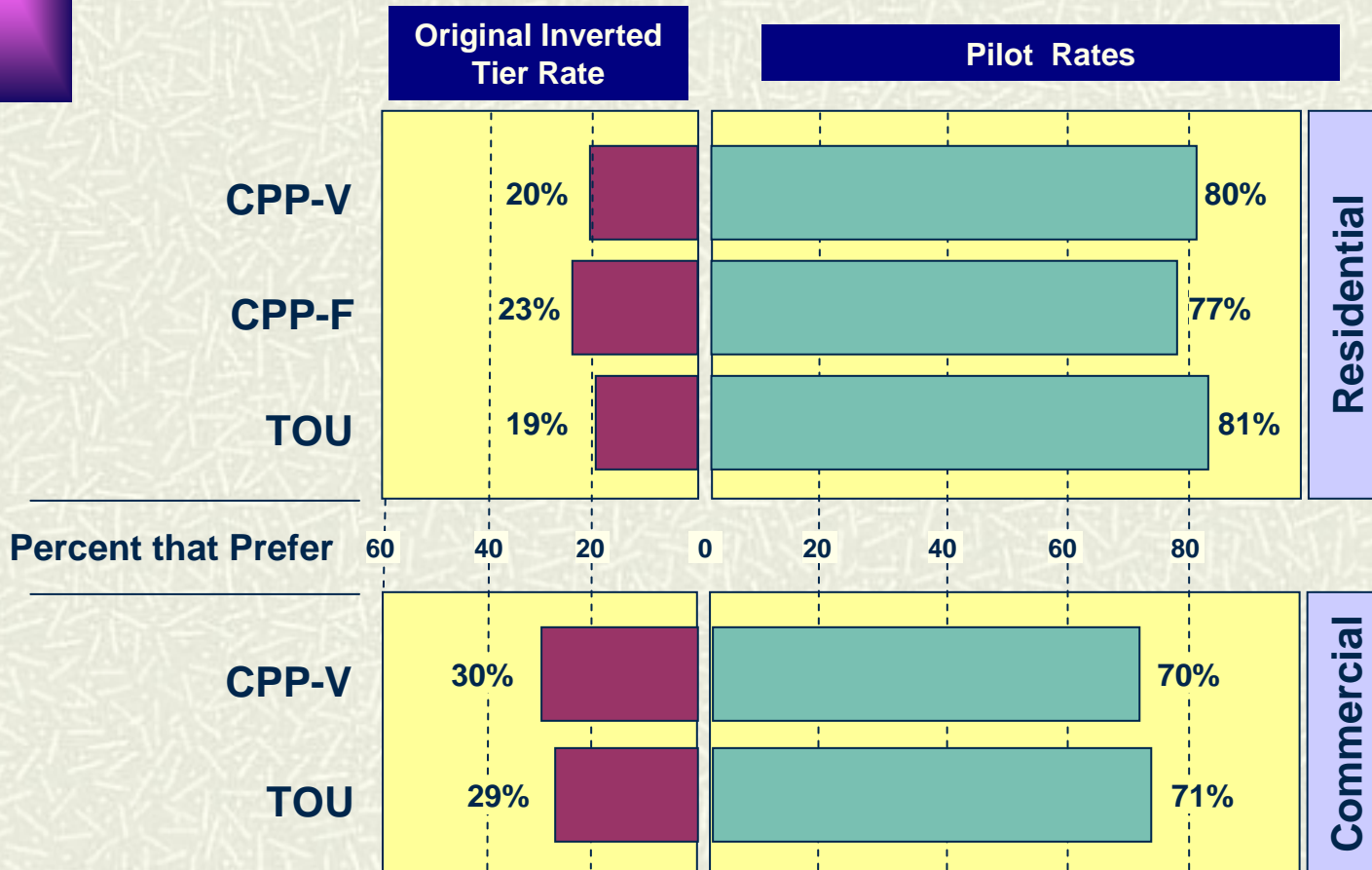
Source: Response of Residential Customers to Critical Peak Pricing and Time-of-Use Rates during the Summer of 2003, September 13, 2004, CEC Analysis.

# Residential Rate Preferences

## Rates Should be Offered to All Residential Customers



# Customer Rate Preferences (Old vs. New)



Source: SPP End-of-Summer Survey Report, Momentum Market Intelligence, WG3 Report, January 21, 2004, p23-24.



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## *Translating the Results*

# **Regulatory Policy and Improved Operating Practices**

# Demand Response – A Customer Perspective

| The Customer Perspective |   | Customer Impact       | Purpose of DR             | Valuing DR                         | Advance Notice   | Time Perspective |                             |
|--------------------------|---|-----------------------|---------------------------|------------------------------------|------------------|------------------|-----------------------------|
| 5                        | <b>Full Outage</b><br>Entire facility outage.   | Total Loss of Service | System Protection         | Full Outage Cost                   | None             | 0-6 hrs/yr       |                             |
| 4                        | <b>End-Use Curtailment</b><br>Targeted end-use automatic curtailment brief period                     | Loss of End-Use       | Grid or System Protection | Expected Value Partial Outage Cost | Seconds or Less  | 2-10 hrs/yr      | Reliability Responsive DR   |
| 3                        | <b>Voluntary Partial End-Use Curtailment</b><br>Reduced usage, increase temp settings or curtailments | Some Comfort Impacts  | Reliability and Economics |                                    | Seconds to Hours | 20-40 hrs/yr     | Price Responsive DR         |
| 2                        | <b>Shifting or Rescheduling</b><br>Load Shifting or Rescheduling                                      | No Noticeable Impacts | Economics                 | kW                                 | Hours to Days    | 40-100 hrs/yr    |                             |
| 1                        | <b>Basic Service</b>  | None                  | None                      | kWh                                | Annual           | years            | Efficiency and Conservation |

**Customer Facility Envelope / Equipment**

Control Systems

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Interface

- Customer facility, end-uses and operating practices define the infrastructure that form the foundation for all DR and efficiency options.
- Efficiency and Demand Response are both part of the same continuum, differing only in time perspectives and valuation factors.



# Regulatory Proceedings – Policy Initiatives

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**1**

**Statewide implementation of advanced metering.**

**2**

**Critical Peak Pricing as the default tariff.**

**3**

**Programmable controllable thermostats in the Building and Appliance Standards.**

# Regulatory Proceedings – Policy Initiatives

|   | Measure  | Purpose  |
|---|--|--|
| 1 | Statewide implementation of advanced metering.                                 | <ul style="list-style-type: none"><li>❑ Facilitate better pricing.</li><li>❑ Support customer education.</li></ul>   |
| 2 | Critical Peak Pricing as the default tariff.                                   | <ul style="list-style-type: none"><li>❑ Integrates efficiency and demand response on a common financial basis.</li><li>❑ Demand response becomes a condition of service for all customers.</li></ul>   |
| 3 | Programmable controllable thermostats in the Building and Appliance Standards. | <ul style="list-style-type: none"><li>❑ Enable / automate customer choice.<ul style="list-style-type: none"><li>▪ Economic response (CPP day ahead)</li><li>▪ Reliability response (CPP day of)</li></ul></li><li>❑ Enable system protection and redefine outage management.</li></ul> |