

NARUC-FERC DR Collaborative

California

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Energy Efficiency and Demand Response Are the Preferred Means of Meeting California's Energy Needs

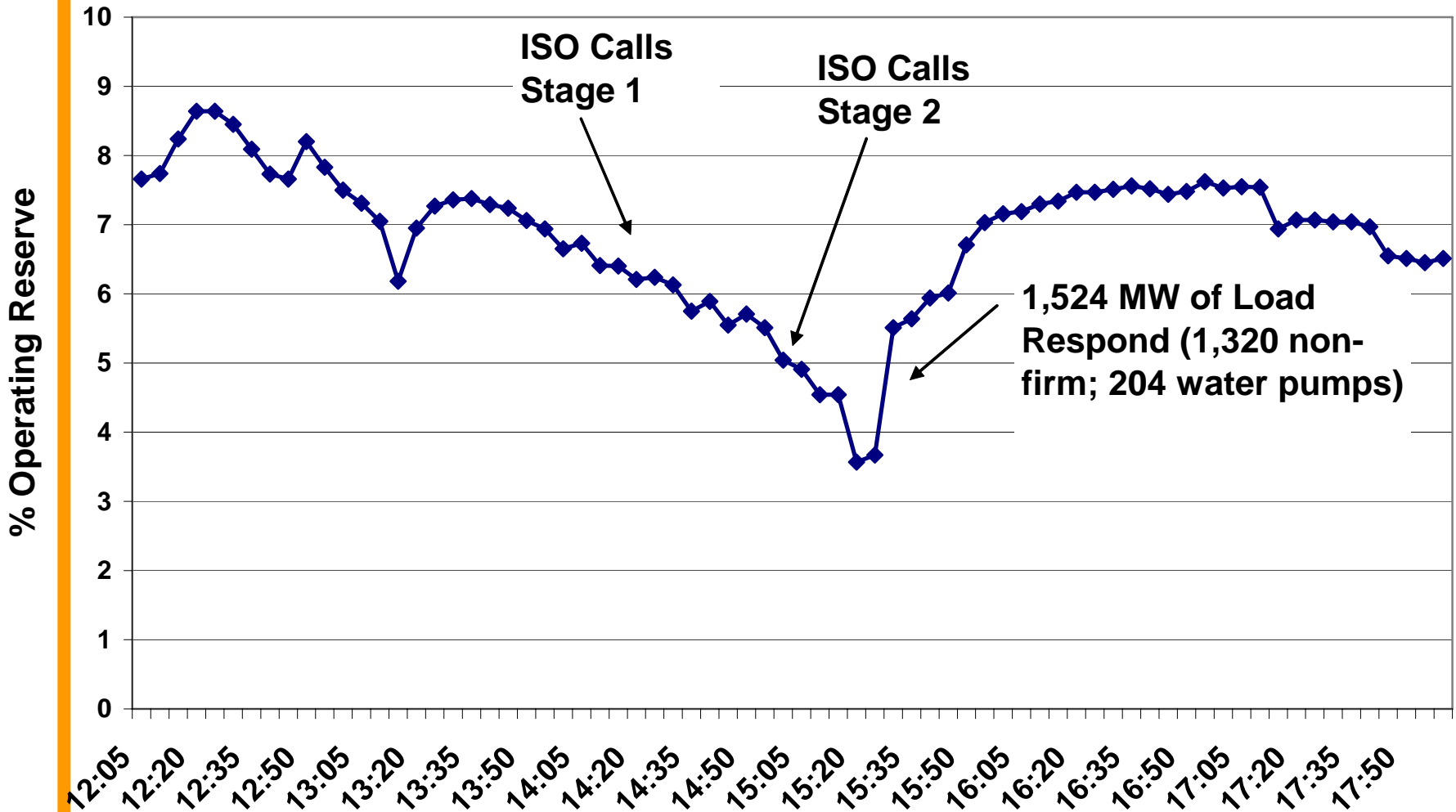
- **The CPUC and the CEC have adopted joint goals for California's energy future that place Demand Response second in the resource "loading order"***
 - Develop programs to increase demand response to 5% of system peak demand in 2007
 - Make dynamic pricing tariffs available to all customers
 - Adopt decisions for statewide installation of Advanced Metering Infrastructure (AMI)
 - Educate Californians about the time sensitivity of energy use and how they can participate in demand response programs
 - Incorporate demand response into the planning protocols of the CPUC, the CEC, and the CAISO

* See Energy Action Plan and Energy Action Plan II

Progress To-Date: Reliability Triggered Programs Are a Significant Resource

- **Potential load impact from utility-run reliability programs represents 1,600 MW, or 3% of peak load**
 - Interruptible programs (PG&E and SCE)
 - Air conditioning cycling (SCE and SDG&E)
- **These programs can only be invoked in a Stage 2 emergency (reserves < 5%) or local transmission problems**

Operating Reserve Margin in CAISO July 10, 2002

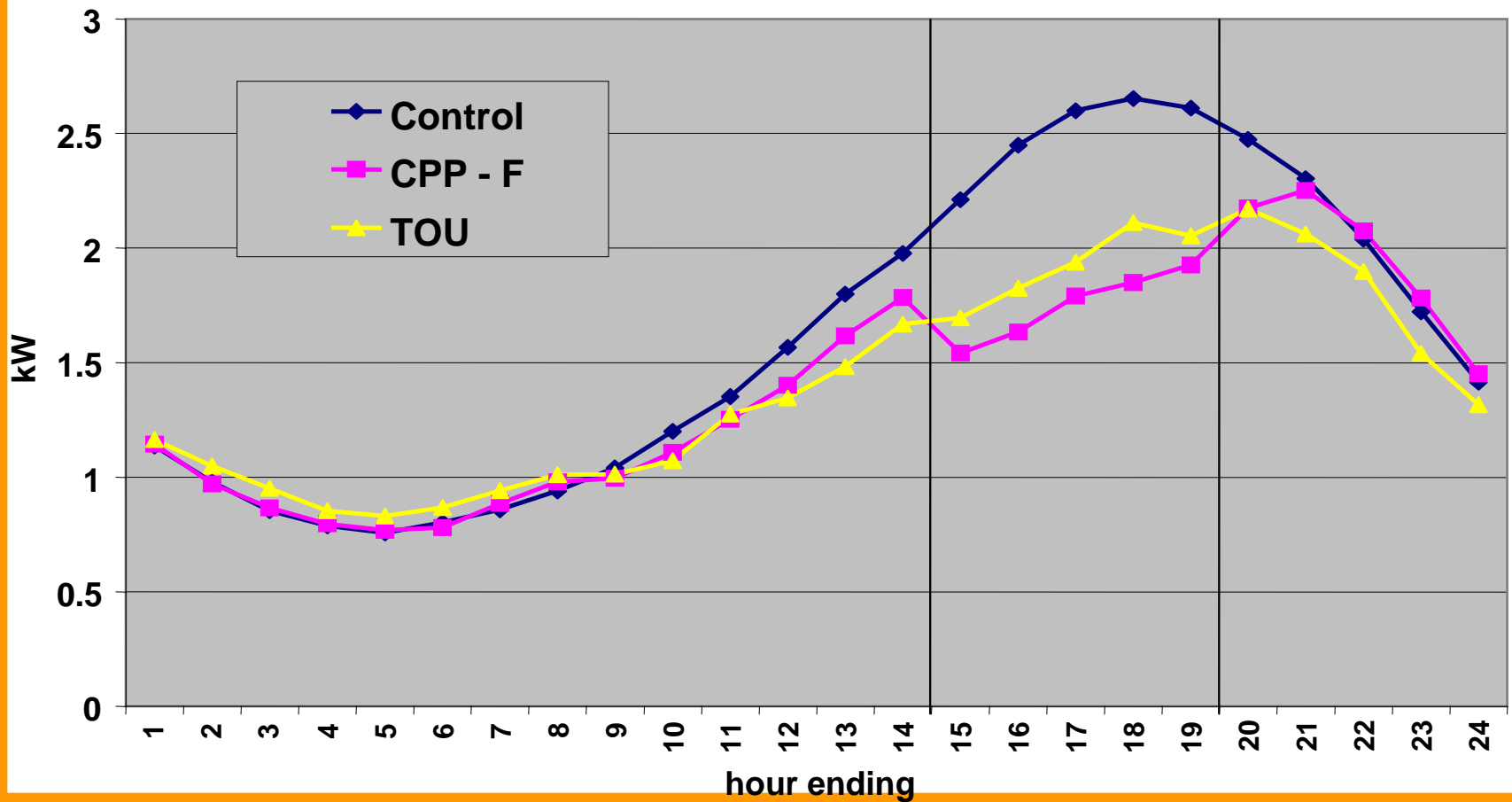


Progress To-Date: Enabling Technology Tested and Deployed

- **Advanced Metering Initiative (AMI)**
 - PG&E: Approved full deployment (5.1m electric, 4.2m gas)
 - SDG&E: Reviewing full deployment plan; decision in April
 - SCE: Proposal to be filed in mid-2007
- **Technology Demonstration and Eventual Deployment**
 - AutoDR demonstrations showing 14% reductions
 - Development of Programmable Communicating Thermostats well underway and likely to be incorporated in Title 24 Building Standards by the CEC
 - Smaller customer response to CPP of 12% reduction without automation and 27% with automation
- **Small demonstration of AC cycling as spinning reserve**

Pilot Projects Show that Customers Respond

Climate Zone 4 (Very Hot Areas) on CPP Days



Definition of Demand Resources

- “Demand response is a tariff or program established to motivate changes in electric use by end-use customers in response to changes in the price of electricity over time, ...”*
- *Price-based* demand response such as real-time pricing (RTP), critical-peak pricing (CPP) and time-of-use (TOU) tariffs
- *Incentive-based* demand response programs
- Some programs are designed with reliability triggers (e.g. ISO Alerts, forecast high temperatures)
- Others are linked to market prices or market price proxies, such as heat rate
- Load-shifting is considered to be a DR resource (e.g. thermal energy storage associated with air conditioning)

* EXECUTIVE SUMMARY of US Department of Energy, Benefits of Demand Response in Electricity Markets and Recommendations for Achieving Them, 2/2006.

Demand Response Measures Implemented and Under Consideration

- **Implemented:**
 - Interruptibles, Voluntary CPP, Demand Bidding Program, Capacity Bidding Program, Air Conditioning Cycling/Programmable Communicating Thermostats, Business Energy Coalition, Technical Assistance, Technical Incentives
- **Dynamic Pricing Tariffs Are Under Consideration:**
 - Residential and small commercial: choice between CPP, TOU and flat
 - Large customers (200 kW to 1 MW): choice between TOU, CPP and RTP, with CPP as the default
 - Very large customers (> 1MW): choice between TOU, CPP and RTP, with RTP as the default

Policy, Research and Stakeholder Input Have Determined Which Measure to Implement

- **Program development has been driven by policy objectives**
 - Linking tariffs to prices
 - Improving system reliability with demand-side resources
 - Reduce electric sector emissions
- **Research and pilot studies have supported policy directives**
- **Program and tariff details proposed by utilities and subject to critique by customers and other stakeholder in regulatory proceedings**
 - Customer preferences have driven program and tariff design
- **Utilities have proposed programs on their own initiative**
- **The CAISO is expected to play a more active role in defining demand response products**

Rulemaking Underway to Measure Load Impact and Cost-Effectiveness

- **Programs currently reviewed by measurement and evaluation working group**
- **The CPUC launched a new rulemaking on January 25, 2007 to improve program design and evaluation**
 - Establish protocols for estimating the load impacts
 - Establish methodologies to determine the cost-effectiveness
 - Set goals for 2008 and beyond
 - Modify programs to integrate into California Independent System Operator's market design

Customers Need to See Value in DR

- **A central question is will pricing tariffs (like CPP or RTP) provide adequate incentive for customers or are incentive payments (e.g. capacity payments) needed?**
- **Or said another way: how to choose between price rationing and capacity rationing with attendant issues of customer baseline and “penalties”? Or should both be offered and customer choose what fits best for them?**
- **Enabling technologies will increase customer acceptance**
 - Programmable Communicating Thermostats will be available and required by CEC Title 24 new buildings standards
 - Automated Demand Response (hardware and tariff) could be popular in commercial buildings with associated reductions in total electricity use