Opening Remarks

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Agenda

- Vision of A Demand Responsive Future
- Systems Integration Case Study
- What is System Integration?
- How is Systems Integration Achieved?
- Strawman PCT (Programmable Communicating Thermostat) SI (Systems Integration) I/F (Interface)
- Panel & Facilitated Public Discussion

Workshop Purpose

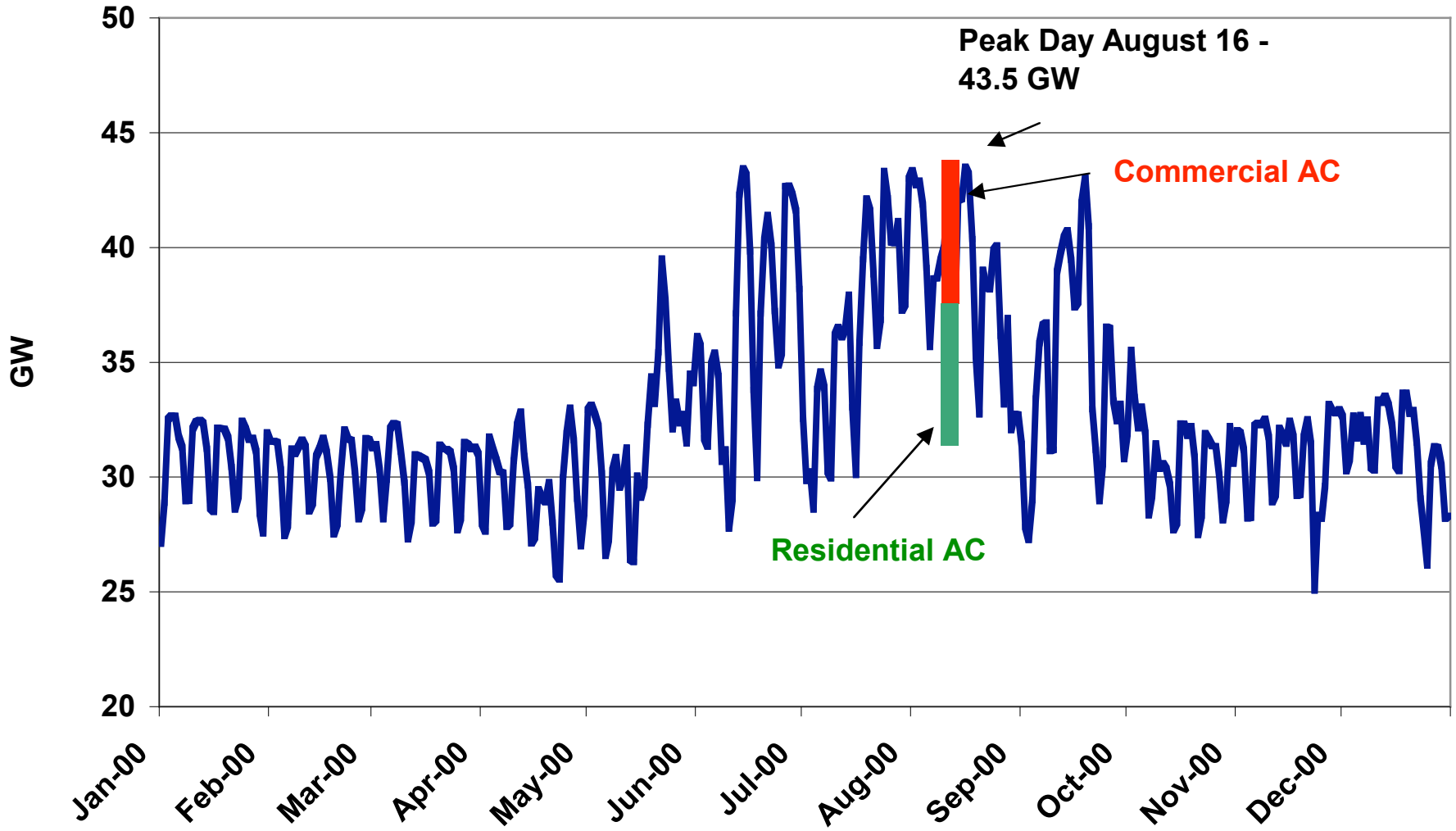
- **Support PCT Title 24 standards process**
- **Define Systems Integration Issues**
  - Communications
  - Networks
  - Information exchange
- **Define WHAT needs to be done**
- **Provide a Strawman for HOW it is done**
- **Get comments from stakeholders**

Background

- California has a peak load problem
- Demand response (DR) solutions can be far less expensive than supply solutions
- A time-dependent system is required
- We are beginning to deploy AMI and time-based load control systems (e.g., PCT) that will need to work together
- Systems integration will be important

Cal ISO Daily Peak Loads

January 1, 2000 - December 31, 2000



Options

- Supply-side solutions to provide for peak demand or system emergencies cost more than demand-side solutions
- It doesn't take much "automated" load reduction to avoid blackouts
- Air conditioning is the low-hanging fruit
- A real-time control and communications infrastructure is required to support price and emergency signals

Policy Objectives

- **Energy Action Plan (EAP)**
  - "Implement a voluntary dynamic pricing system to reduce peak demand by as much as 1,500 to 2,000 megawatts by 2007."
- **Integrated Energy Policy Report (IEPR)**
  - Loading order has DR in second priority
  - 5% peak reduction by 2007
  - Dynamic tariffs for large customers
  - AMI for smaller customers w/ large loads

Demand Response Definition

- **Demand Response (DR) is the action taken to reduce load when:**
  - Contingencies (emergencies & congestion) occur that threaten supply-demand balance, and/or
  - Market conditions occur that raise supply costs
- **DR typically involves peak-load reductions**
  - DR strategies are different from energy efficiency, i.e., transient vs. permanent

A Systems Integrated Vision

- Create a real-time, automated DR infrastructure that is simple to use and can adaptively respond to changing contingency and market conditions
- A DR infrastructure must coexist with legacy systems, allow for future technology and tariff improvements, and have near-, medium-, and long-term benefits to California ratepayers

Assumptions

- Minimum requirements that meet DR objectives but don't impede the future
- Allow path for incremental upgrades
- Focus on least expensive solutions using today's technology with a path to future
- Expedite implementations of AMI and signal-responsive load control systems

Deployment Comparison Between AMI and Load Control Devices

System Initiative	Advanced Metering Infrastructure (AMI)	Load Control Devices (e.g., lights, thermostat, pool pumps, EMCS)
Market Process	Regulated	Unregulated
Owner	Utilities	End user (residential, C&I)
Primary Function	Provide electricity metering & monitoring	Control actions in response to signals: price (market) , reliability (contingency, system protection)
Supported Features	• Changing tariffs • New applications • Inc. upgrades • Net metering • Gas & water	• Default control/shed strategies • Manual override switch • Default programming option • Remote audit/support • Customer choice
Other Stakeholders	Regulators (rate case)	Utilities (system reliability, incentive programs)

In Order to Stay on Schedule

- Clarifying questions only
- Save your comments for the facilitated discussion from 3-4 PM
- Depending on the outcome of the workshop, there may be another workshop next quarter to delve more deeply into specific issues