Enabling Technology as Applied to Pricing Pilots for California

Demand Response Enabling Technology Development Workshop

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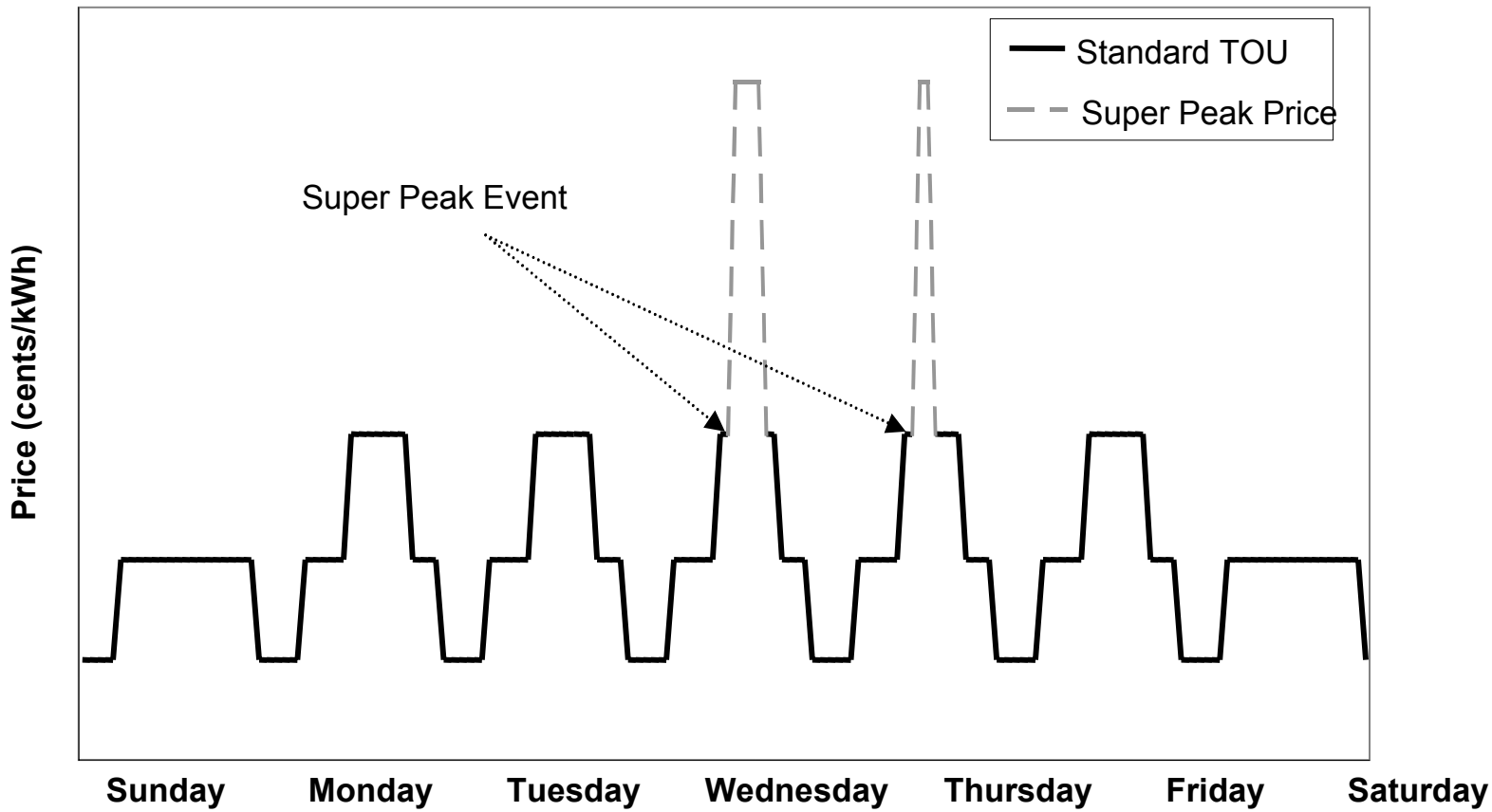
Statewide Pricing Pilot (SPP)

- Statewide pilot test of dynamic pricing for residential and small commercial customers in California (n = 2,500)
- Customer will be placed on time of use pricing and will receive "super peak" price signals on a day-ahead or day-of notice
- Scheduled for summer 2003 through spring of 2004 (12 – 18 months)

New SPP Dynamic Rates

- Time of Use (Shift and Save) – for both residential and commercial (simple hi/lo differential pricing, from 1.7 to 3.6)
- CPP F or V (Super Peak) – time of use base with an event driven peak price, 15 days or less a year (peak price 5 x on-peak rate)
- Multiple rate versions to develop elasticities

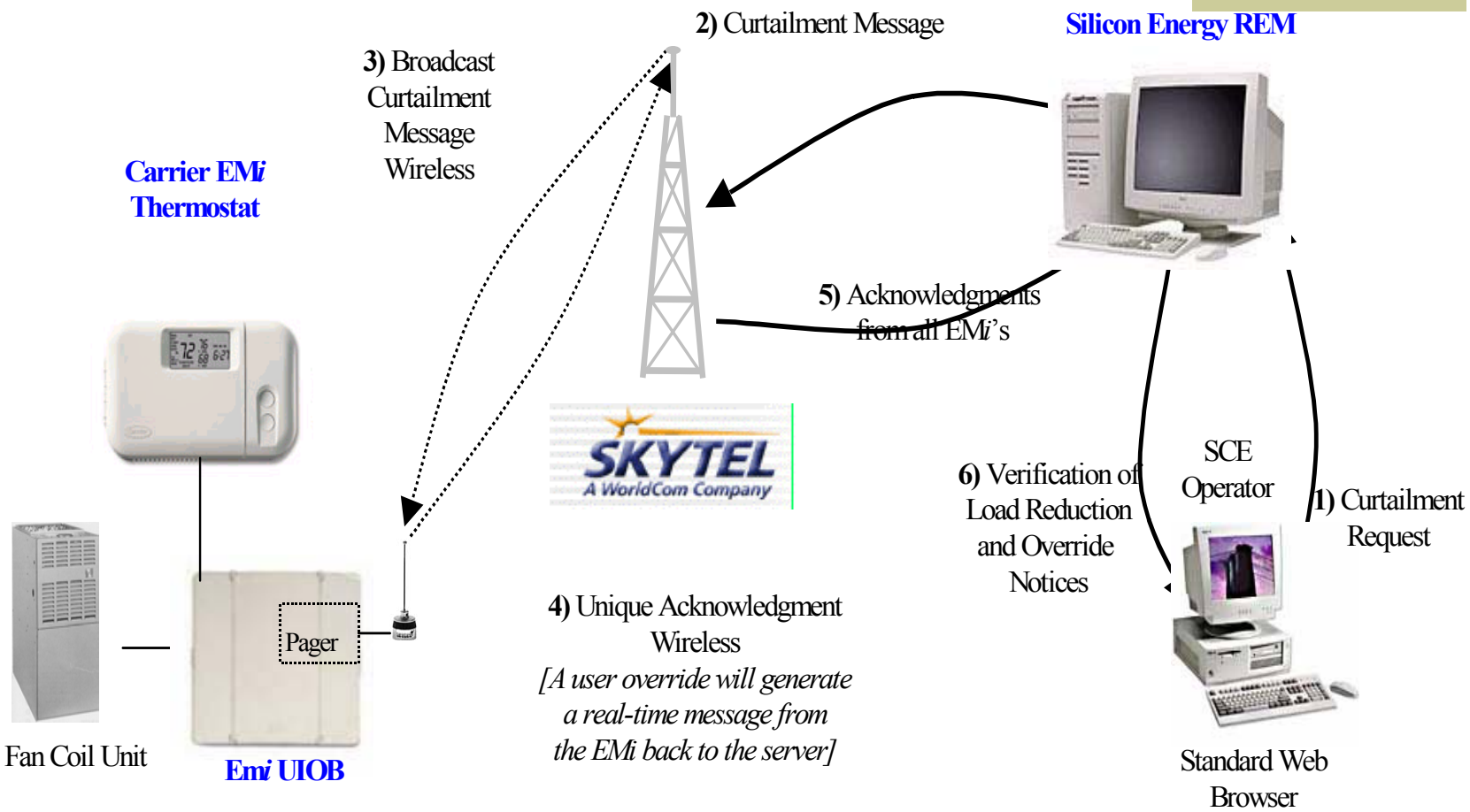
New Super Peak Rates



Enabling Technology Concept

- During Super Peak, customers are motivated to shift or avoid usage by being charged higher retail price for electrical energy
- Enabling technologies allow customers to automatically facilitate price-response, in addition to manual behavioral changes
- Smart Thermostat technology borrowed from AB970 pilot (SCE and SDG&E)

Two-Way Smart Thermostat



SPP-ACT Project Background

- SPP requires IOUs to offer some Super Peak customers a choice of enabling technologies, based on inventory of appliances (end uses)
- Basic enabling technology predefined (Smart Thermostats) but IOUs must present plan for additional control technology (ACT)
- ACT filing was made April 14, 2003

SPP Multi-Track ACT Approach

- One category of residential and commercial customers (Track A) would receive new Super Peak rate and an offer of enabling technology (Smart Thermostat, or pool pump and/or water heater control)
- Second category (Track C) would recruit from AB970 pilot and offer Super Peak rate, utilizing existing Smart Thermostats

Residential ACT Solution

- SDG&E proposed to use Carrier Smart Thermostat for new customers, and to offer Cannon pager-controlled switch for pools pumps and electric water heaters
- This enables customers with no AC (common in San Diego) low-cost enabling technology for other major appliances

SDG&E expected ACT response

Number of Customers	Comments
125	Total Customers on CPP-V, Track A (residential)
13	~10% of customers expected to choose 'none'
60	~50% of those remaining expected to choose Smart Thermostat
26 / 26	~20% of those remaining expected to choose pool pump / electric water heater switch

Commercial ACT Solution

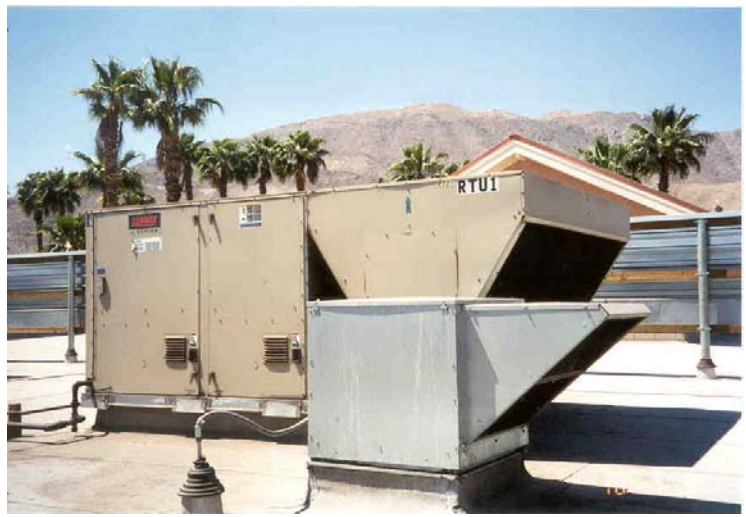
- SCE proposed to utilize Carrier Smart Thermostat with Super Peak indicating light
- Decision gave SCE six months to develop ACT solution for other end uses
- SCE plan will utilize existing Carrier system to control other loads, and develop stand along control for non-HVAC sites

SCE Track A Sample Design

< 20 kW Super Peak 58 service accounts

> 20 kW Super Peak 80 service accounts

- Commercial only
- Inland areas
- Enabling technology optional



Distribution of Commercial Buildings within SCE*

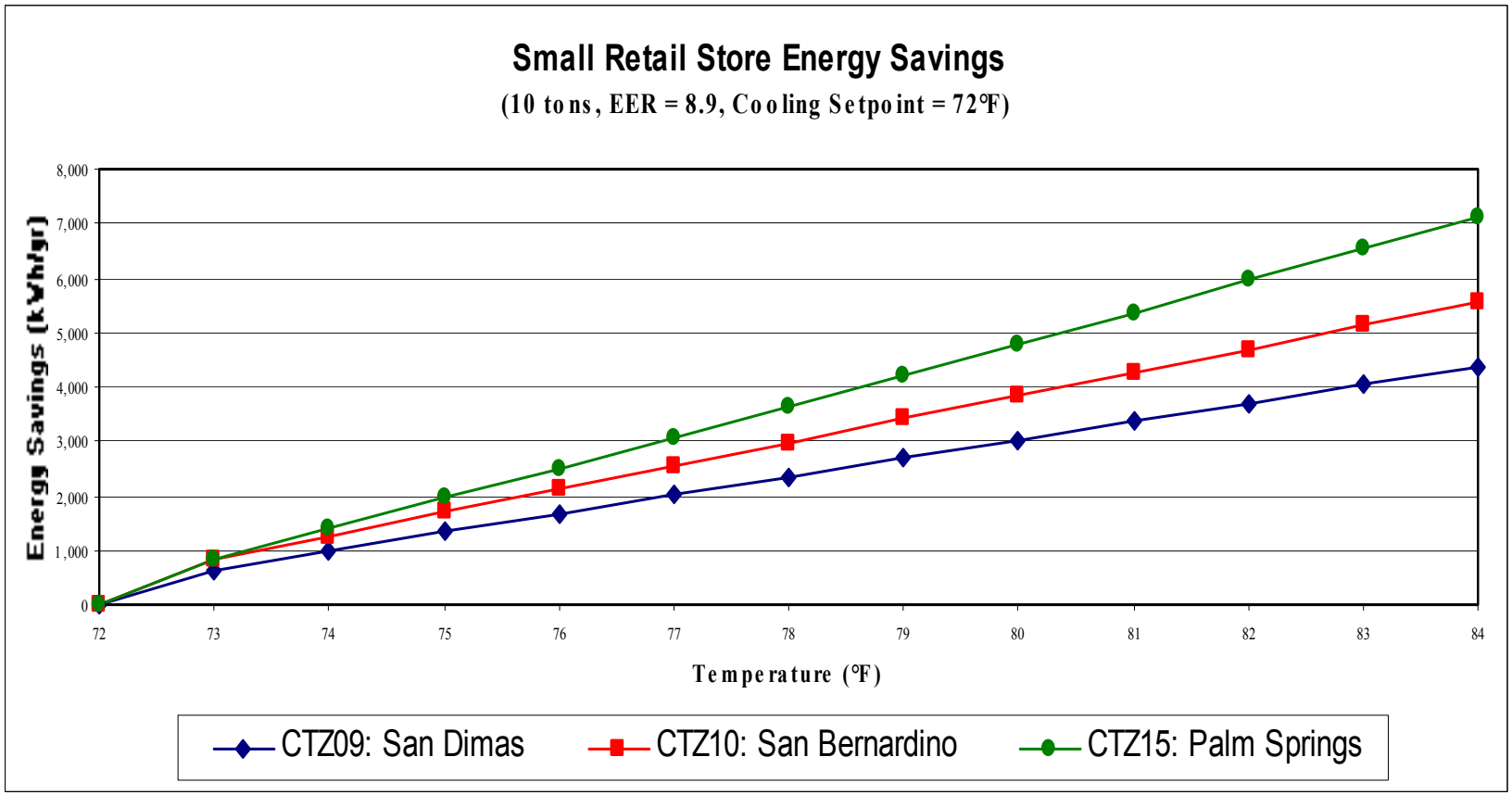
- Retail 26%
- Restaurant 6.3%
- Sm. Office 17%
- School 13.1%
- Misc. 26%
- Large Office 1.3%
- Lodging 3.1%
- Warehouse 4.7%
- Health 1.4%
- Grocery 1.6%

* SCE 1997 Commercial End Use Survey

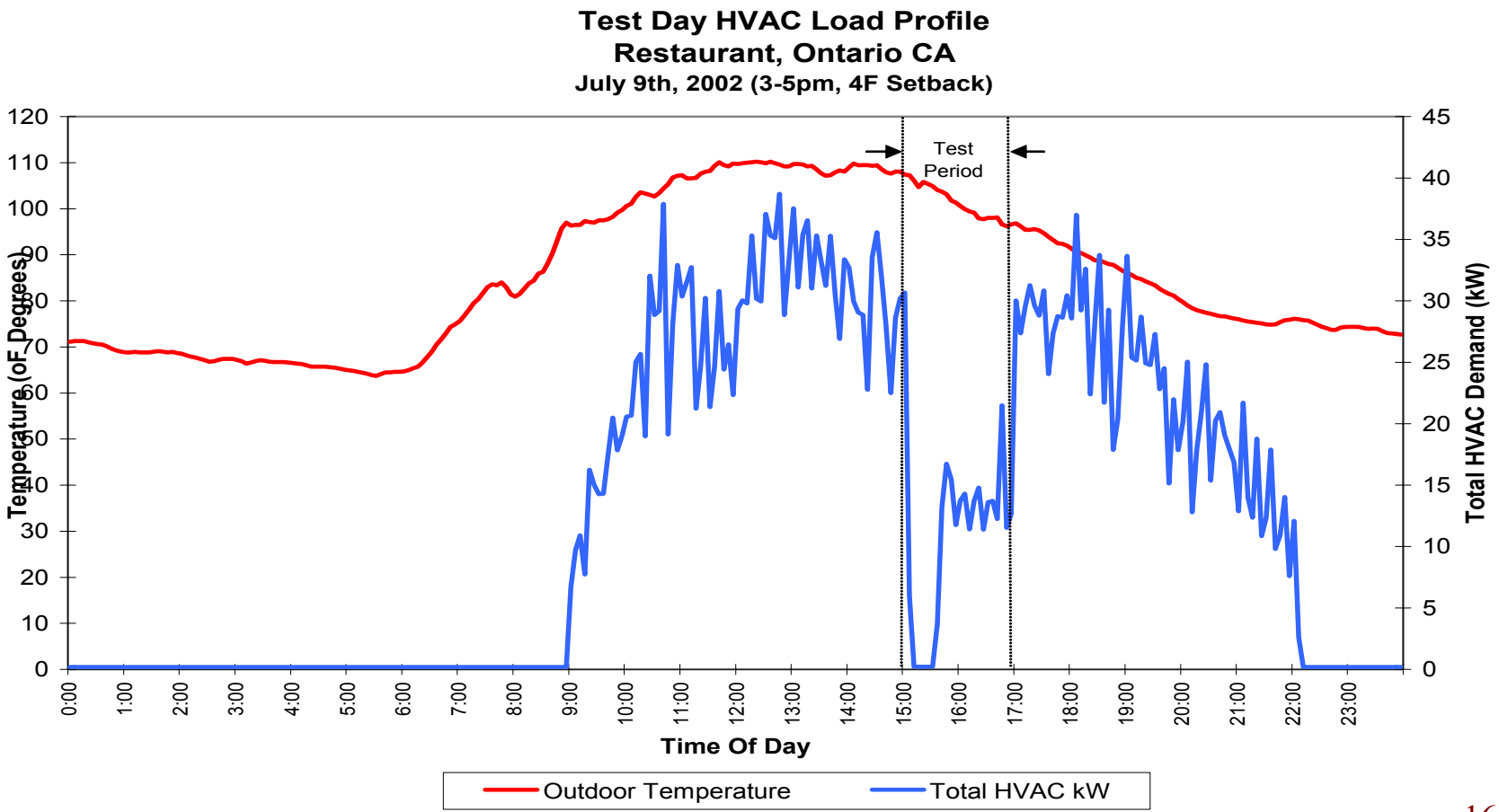
Smart Thermostat a Proven Enabling Technology

- Energy savings and demand reduction based on the remote adjustment of the AC set point (from 2 – 6 degrees higher)
- Depending on AC unit loading, savings and load reduction vary per customer
- Other factors include building envelop, space utilization, and external temperatures

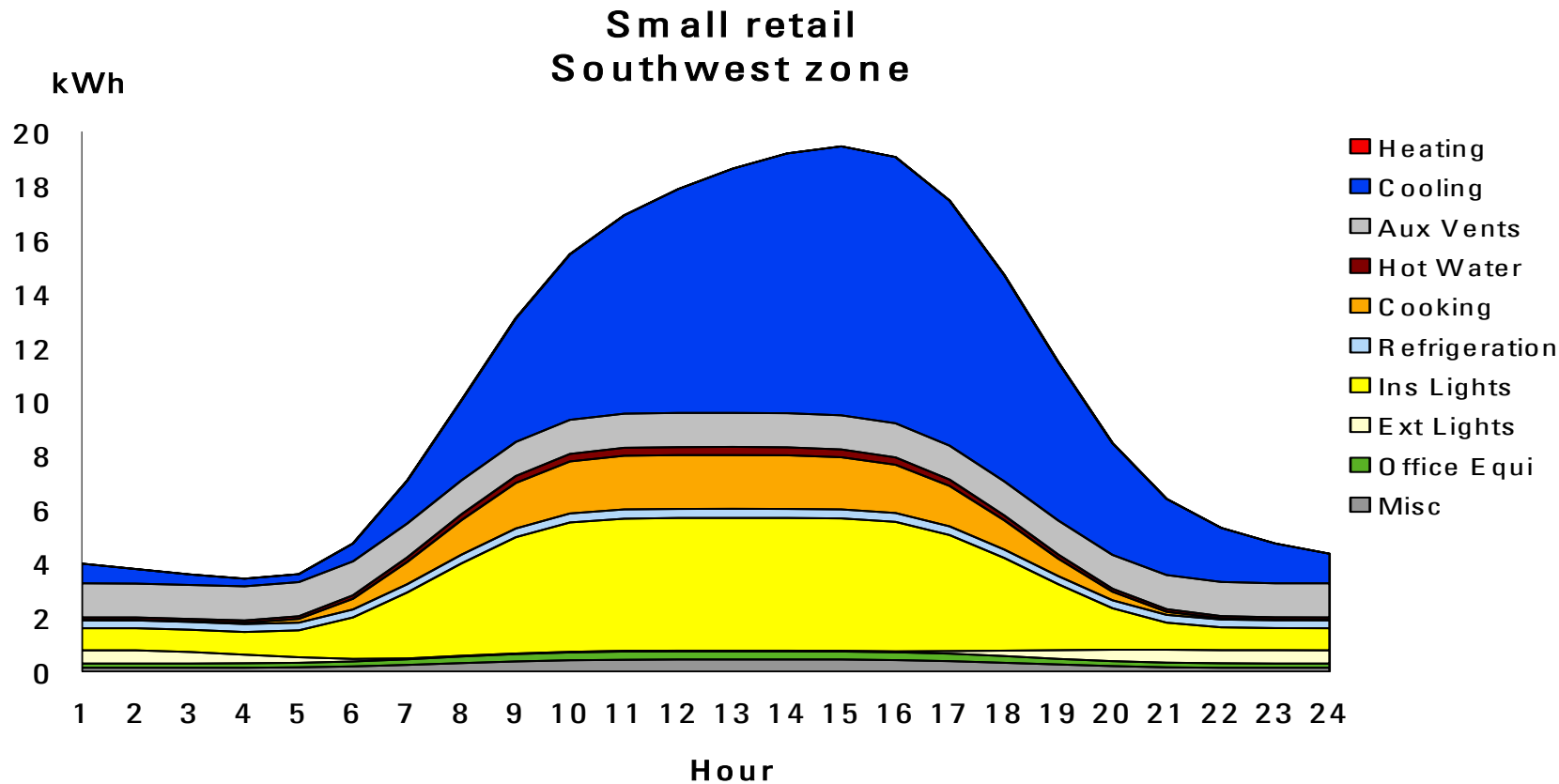
HVAC setpoint/savings ratio



AC load reduction at customer facility from Smart Thermostat



Retail commercial end uses*



Summer weekday

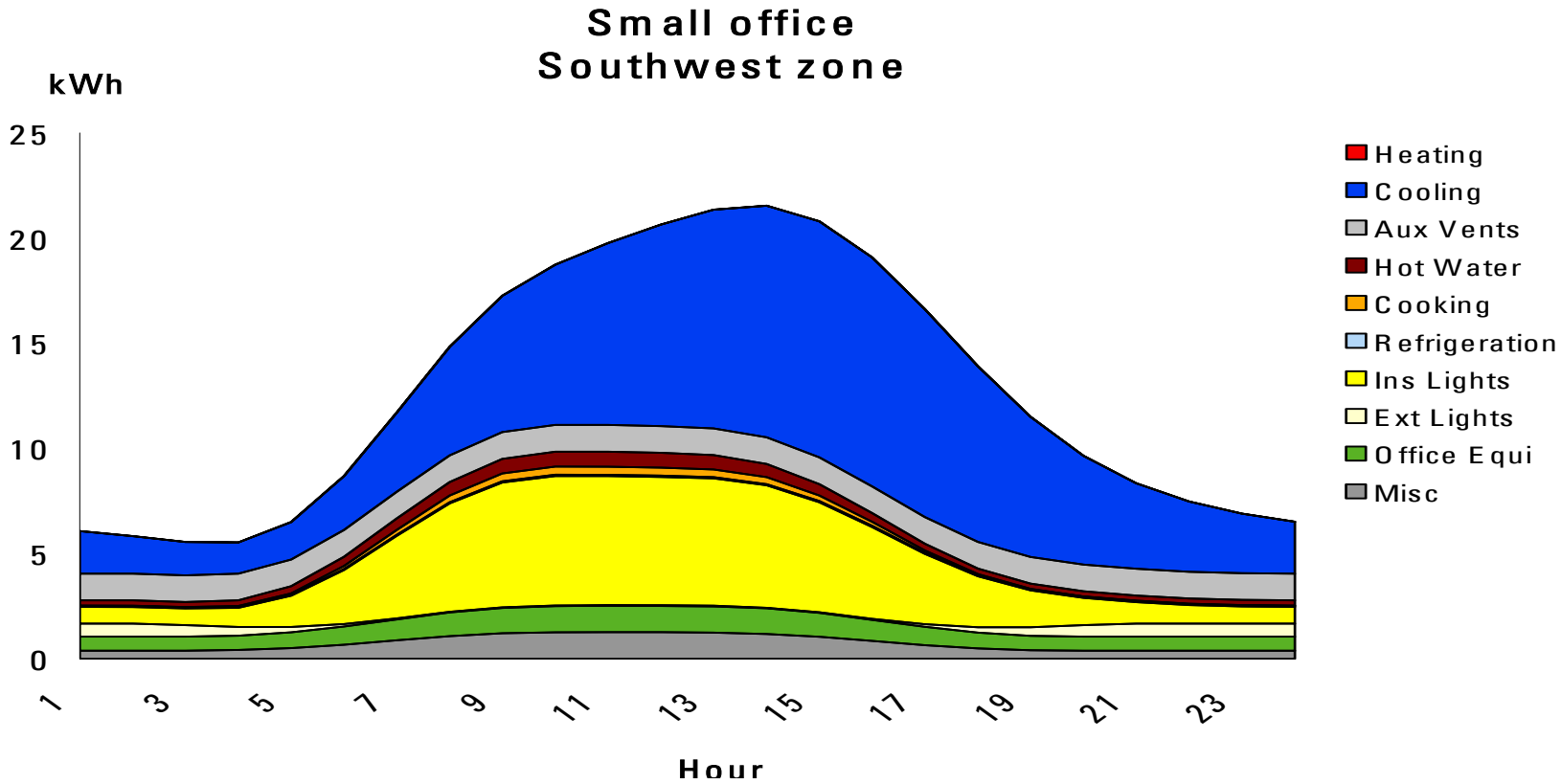
*Data graph courtesy Primen

Heat type: Electric
Load: Electric (kWh)

What are the other Small Commercial "appliances"?

- (Al)most all commercial customers have packaged AC systems and overhead lighting
- Other end uses include office equipment, food prep or storage, water heaters, and business-specific plug loads

Office commercial end uses*



Summer weekday

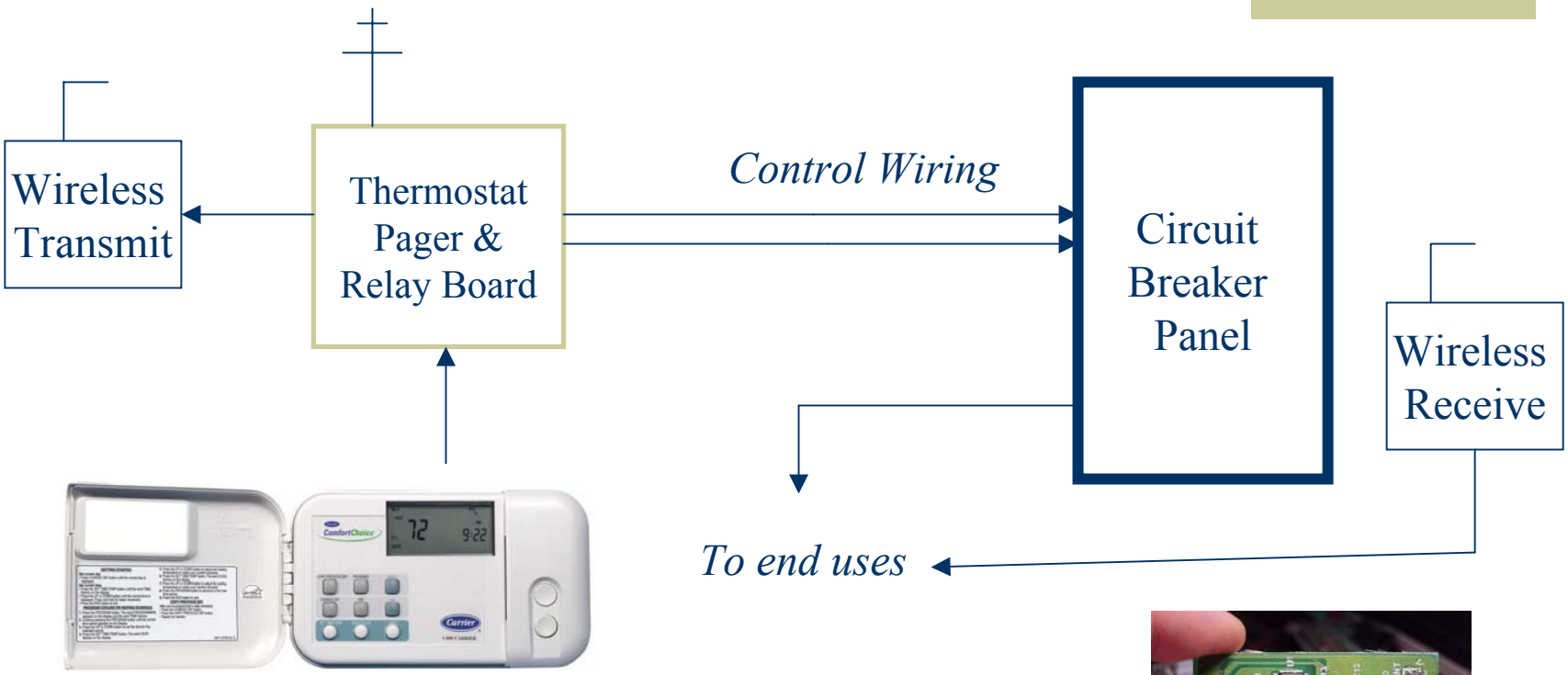
*Data graph courtesy Primen

Heat type: Electric
Load: Electric (kWh)

SCE Proposed Implementation Approach for SPP-ACT

- Enroll Track A customers with "SPP-ACT ready" Smart Thermostats – CPP light and relay options
- Market Research – assess commercial end uses in both AB970 & SPP inventory and "curtailability"
- Technology Assessment – small test sample to identify and control "auxiliary loads" in Track A
- Program Implementation – offer additional load control options for Track A, based on customer preferences and load options

Smart Thermostat ACT Scheme– HVAC, lighting and other



Smart Thermostat Auxiliary Load Control

SCE Schedule for SPP-ACT

- Provided “ACT ready” Smart Thermostats to Track A participants, as requested (n = 30 so far)
- Receive go-forward approval with draft plan -June?
- Conduct market research and technology pilot in preparation of implementation (June - July)
- Offer the ACT options to SPP participants at least six months after program start (September)