



DEMAND
SHIFTING
through
THERMAL
MASS



Demand Shifting through Thermal Mass

Focus Group Results

*J. Carlos Haiad, P.E.
Southern California Edison
Design & Engineering Services*

March 21, 2005



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Objectives

- Learn More about the Customer Perception of the Pre-Cooling Concept
- Learn More about the Customer Acceptability of Different Pre-Cooling Strategies
- Learn More about the Customer Requirements for Participation on a Pre-Cooling Program
- Learn More about the Best Ways to Promote the Pre-Cooling Program



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Site/Participant Selection

- Site Selection
 - Small (GS-2) commercial/industrial
 - Demand: $50 < \text{kW} < 500$
 - Client/customer traffic
 - Air-conditioned spaces
 - Air conditioner capacity: $3 \leq \text{ton} \leq 15$ and controlled by a thermostat
 - Basic building construction
 - Tilt up, block, wood frame, etc.
- Participant Selection
 - Have control of or access to the thermostat
 - Non-participant of a load control program (22 people in 2 focus groups)
 - Participant of the SCE EnergySmart Thermostat program (20 people in 2 focus groups)

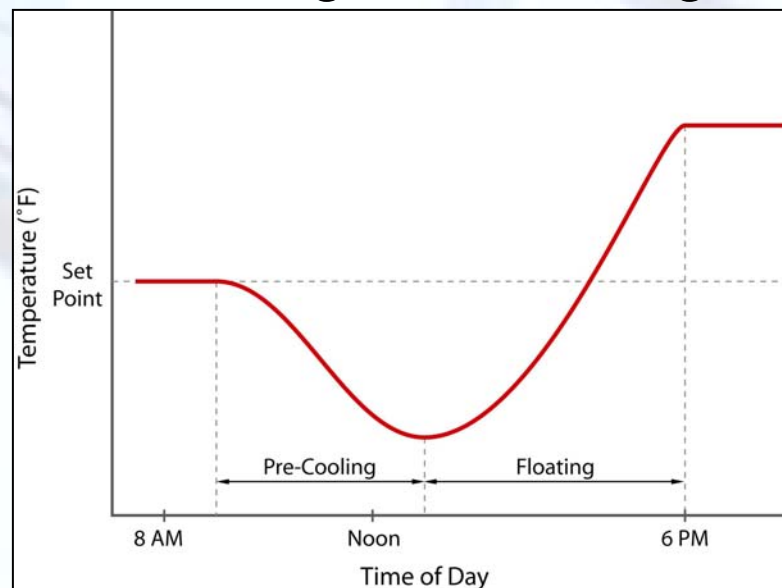


DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Pre-Cooling Strategy

- During the Summer
 - First Sunday in June through first Sunday in October
- Afternoons (noon to 6:00 p.m.)
 - Up to 15 times per year
- Lower the Temperature a Few Degrees Starting Mid Morning and Then Rise the Temperature a Few Degrees Starting Early Afternoon
- Install a New 7-day Programmable Thermostat Free of Charge





DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Non-Participant Results

- Initial Reaction to Pre-Cooling: The Skeptics
 - Question the effectiveness of reducing the temperature in advance
 - “Temperature reduction will not last”
 - “Too many customers coming and going”
 - “Building is not well insulated”
 - Question if pre-cooling would increase their utility costs
 - “Not saving energy”
 - “Just redistributing, save nothing”
 - Question if pre-cooling would actually increase discomfort and even lead to health problems due to a wide temperature swing
 - “The farther the amplitude, the more complaints”
 - “It is human nature”
 - Question if pre-cooling would wear out the air conditioner faster
 - “The air conditioner is now working harder”



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Non-Participant Results

- Initial Reaction to Pre-Cooling: The Enthusiastic
 - Immediate recognition of increased comfort potential
 - “Do you hear more complaints about too cold or too hot? Too hot, Right?”
 - Saving energy seemed less of a concern among these customers
 - “I am trying to save energy, but, yes, I would love it”
 - Although difficult to draw any final conclusion, those who immediately liked pre-cooling were almost all women



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Non-Participant Results

- Pre-Cooling Needs to Be Experienced
 - Shortly after the initial reactions, both the skeptics and the enthusiastic agreed that pre-cooling must be experienced to see how comfort and/or energy use are impacted
 - “I think someone would actually have to experience it to really know”
 - “I can not visualize letting it be cooler for a couple of hours is going to make up for being really hot”
 - Would it be possible for SCE to go to some of the companies and do a study on each company?
- Pre-Cooling Set Point Adjustment
 - Most agree with up to 3 degrees, with some up to 4 degrees
- Window Signs Showing Participation
 - Free them from dealing with complaints
 - “I would rather have a sign in the window than any kind of incentive”



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Non-Participant Results

- Non-Participant Customers
 - At the end of the each focus group more than half of the customers were interested in the pre-cooling strategy
 - This suggests that pre-cooling requires a lot more education, demonstration, and information to get the customer on board than the basic EnergySmart Thermostat program.
 - Customers want to know that pre-cooling
 - Would not increase their costs
 - Would increase their comfort during the adjustment period



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Energy\$mart Results

- Initial Reaction to Pre-Cooling
 - Question the effectiveness of reducing the temperature in advance
 - “It would cool down, and then the air goes off 10 minutes later and it is hot again”
 - “The curtailment is 4 to 6 hours. If you cool it down earlier, it might be good for half hour. After that is still going to get warm”
 - Question if pre-cooling would increase their utility costs
 - “My doors are open a lot. I have 300 to 350 customers a day coming in and out. It would cost me money”
 - “I thought the whole thing was to save energy, but then they are using more energy to lower it first”
 - Question if pre-cooling would actually increase discomfort and even lead to health problems due to a wide temperature swing
 - “I do not want to go from “it is feeling really nice in here” to “Oh, my God, I am ready to go home”
 - “Have you cleared this with CAL-OSHA?”



DEMAND
SHIFTING
through
THERMAL
MASS



Focus Group: Energy\$mart Results

- Pre-Cooling Set Point Adjustment
 - Most agree with up to 4 degrees
- Energy\$mart Customers
 - At the end of each the focus group most of the customers seemed willing to try the pre-cooling strategy if they could opt-out of the set point decrease as they can for a set point increase in the Energy\$mart program
 - These customers seem to have a general willingness to try just about anything if there is little downside risk