



Financial Cost/Benefits Energy Efficiency Programs

An Austin Energy Perspective

Presented by
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Blue Skyways Energy Savings
Conference
Council Bluffs, Iowa



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Overview



Austin Energy – Austin, Texas

- ◆ Municipal-Owned Electric Utility
 - *9th Largest Municipal Utility*
- ◆ Serves > 888,000 Population
 - *320,000 Residential*
 - *40,000 Commercial*
- ◆ Generation – 2,700 MWs
 - *Coal 35%, Nuclear 28%, Gas 28%, Purchase Power 5%, Renewable 4%*



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***Editorial Published in
Austin-American Statesman - 10/07/07***

***“Over the next 15 years,
boosting markets for more efficient products
(lighting, cooling, heating and industrial
processes) can eliminate over 80% of forecast
growth in electricity demand, while lowering
consumers’ energy bills”***

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Program History



How Did Austin Energy Get Start!

- ◆ Original Program Developed in 1982
 - Austin City Council – Passed Ordinance Creating Energy (Efficiency) Department
- ◆ Home Improvements Offered
 - Low Interest Loan Program – Residential Customers
 - High Efficiency AC, Home Sealing, Attic Insulation
- ◆ Core Group of Contractors
 - 4 to 5 Local Contractors

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Program History



Accomplishments - Past 25 Years!

- ◆ Peak Demand Savings – 772 MW
- ◆ Energy Savings – 1,211,696 MWH
- ◆ # of Participants – 620,309

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Energy Efficiency . . .

Gives Austin Energy the Ability to:

- ◆ **Manage Power Purchase Costs**
 - *Minimizes Volatile Fuel Costs & Charges*
- ◆ **Provide Options to Utility Customers**
 - *High Bill Complaints & Delinquent Accounts*
 - *Enhanced Customer Service*
- ◆ **Satisfied Customer!**

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Austin City Council



Resolution September 14, 1999

“Cost-effective conservation programs shall be the first priority in meeting new load growth requirements of Austin Energy.”

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Austin Energy's Commitment

◆ *Austin Energy – Strategic Plan!*

- 15% Demand-Side Management by 2020
- 20% Renewable Energy by 2020
- 100 MW of Solar by 2020

◆ *Continue Offering of Cost-Effective Energy Efficiency Programs!*

- Targeting Residential, Commercial, Low-Income Customers

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Capital Cost – New Generation

<u><i>Power Plant – Fuel Type</i></u>	<u><i>Cost/kW</i></u>
◆ Natural Gas – Combined Cycle	\$750
◆ Pulverized Coal	\$1,549
◆ Nuclear	\$2,800

Source – National Energy Technology Lab (NETL)

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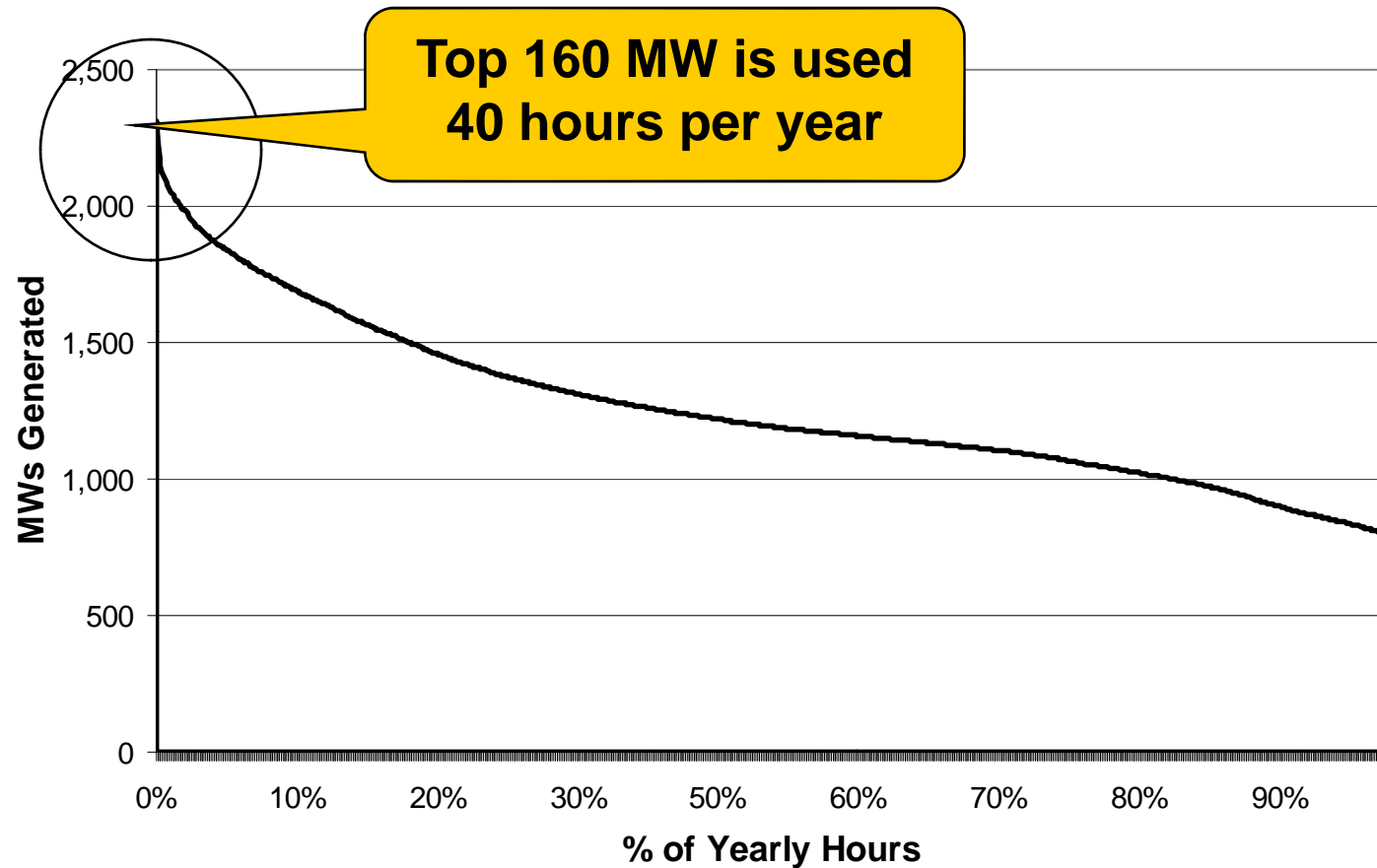
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Energy Efficiency Opportunity



AE System Load Duration Curve - 2004



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Program Elements



Keys to Success!

- ◆ Work Closely with Utilities Fuels Planning & Power Supply Dept.
- ◆ Energy Efficiency Goals – Should Be Part of Long Term Load Forecast
- ◆ Programs Must Be Cost Effective

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Program Elements



Modeling/Load Forecast

- ◆ Hourly Electric Load Shapes Developed
- ◆ Hourly KW Savings are Determined Through Computer Modeling
- ◆ DSM Impacts are Included in Load Forecast

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Program Elements



Cost Effectiveness Tests

- ◆ **Standard Practice for Cost-Benefit Analysis of Conservation and Load Management Programs - Published 1983**
- ◆ Used to Compare Program Costs to Supply-Side Options
- ◆ DSM is Lower Cost Option than Supply-Side Options
- ◆ Residential DSM Cost: \$439 per peak kW saved
- ◆ Commercial DSM Cost: \$272 per peak kW saved

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Program Elements



Cost-Effectiveness Tests

- ◆ **Participant Test:** measures benefits to the customer
- ◆ **Utility Revenue Requirement Test:** measures the net costs of DSM program incurred by the utility
- ◆ **Total Resource Cost Test:** measures the net costs of DSM based on total costs to all participants and the utility
- ◆ **Rate Impact Measure Test:** measures what happens to customer rates due to DSM program

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Energy Savings are Calculated Estimates

Baseline Equipment Peak kW Efficiency
– High Efficiency Peak kW Equipment
kW Savings

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Example Energy Calculation:

Replace Standard 3-Lamp T12 Fluorescent Fixture = 112 Watts*
with a New 3-Lamp T8 Fluorescent Fixture = 75 Watts*

$(112 \text{ watts} - 75 \text{ watts}) = 37 \text{ Watts of Energy Saved per Fixture}$

*ANSI rating

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Why Does DSM Work?

- ◆ Equipment Changes –
“Not” Behavior Modification
- ◆ Inspection of Installation Work
- ◆ Consumption Verification
- ◆ Program Evaluation

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DSM Focuses on Technology Upgrades



◆ Eligible technologies

- High efficiency ventilation and air conditioning (HVAC)
- Air Duct Sealing & Improvements
- Energy efficient lighting equipment
- Premium efficiency motor
- Home weatherization

◆ Ineligible Conservation Measures

- Maintenance and operation changes
- Turning off equipment
- Removing equipment
- Down-sizing equipment

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Inspections

- ◆ Pre-Inspections
- ◆ Post-Inspections
- ◆ Rebates payment based on post-inspection

Program Evaluation

- ◆ Measurement and Verification
- ◆ Utility Bill Analysis

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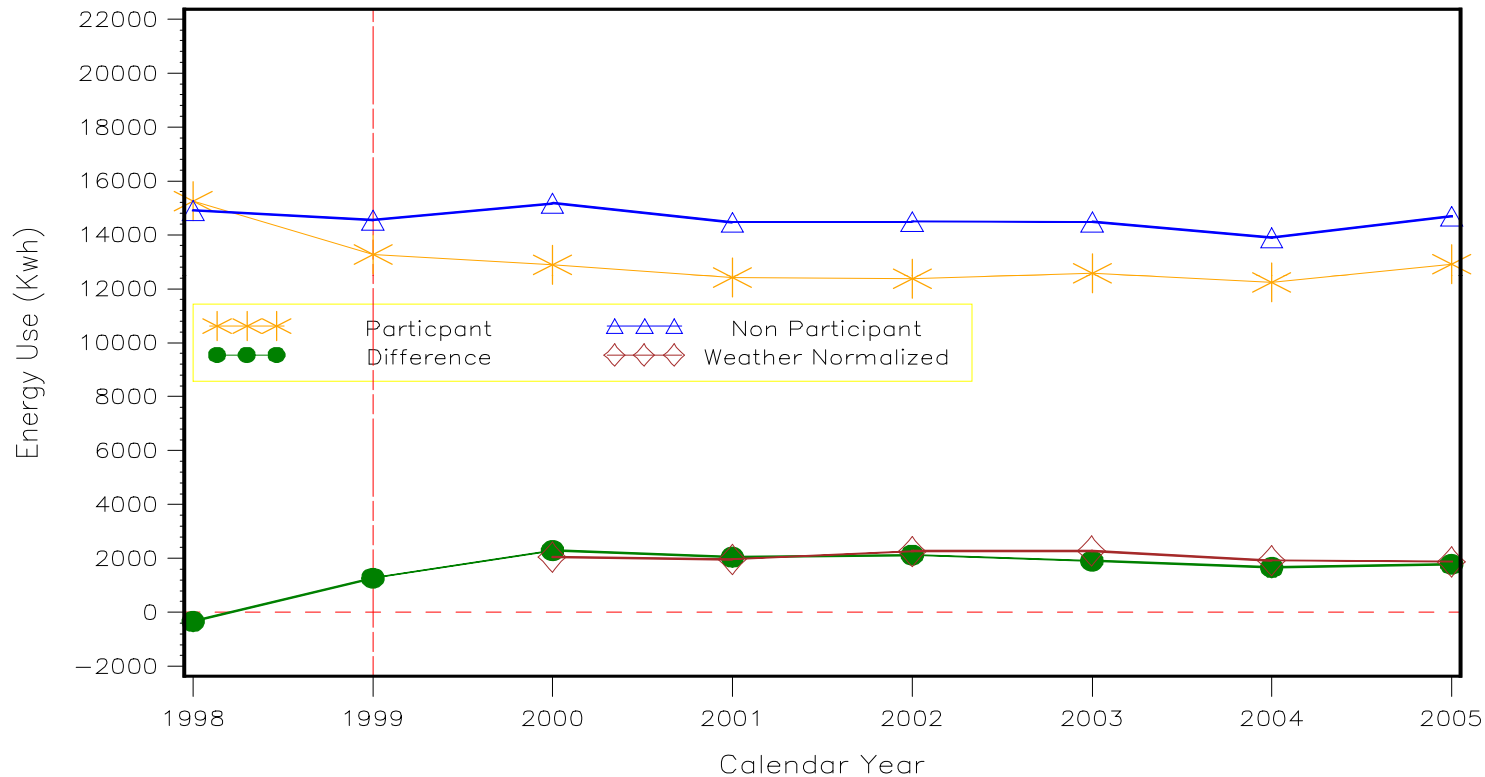
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Measurement & Verification



1999 Loan and Whole House Participant Impacts
Residential Program Participants as Compared to Austin Energy Non Participants
Weather Normalized Savings Included



Control Group Based on Entire Population of Non-Participants

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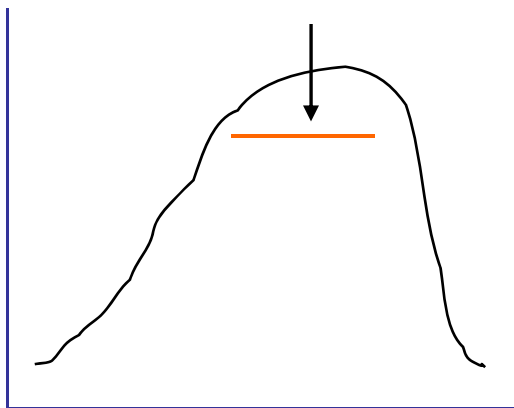
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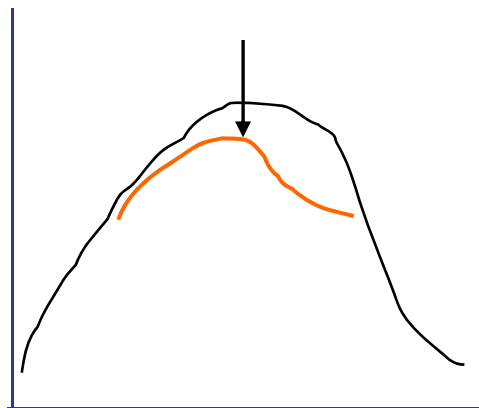


Energy Use Modification

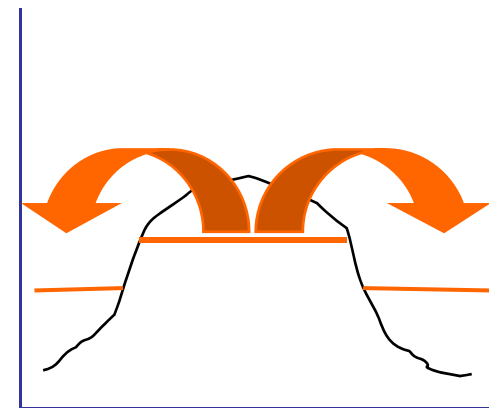
Peak Clipping



Strategic Conservation



Load Shifting



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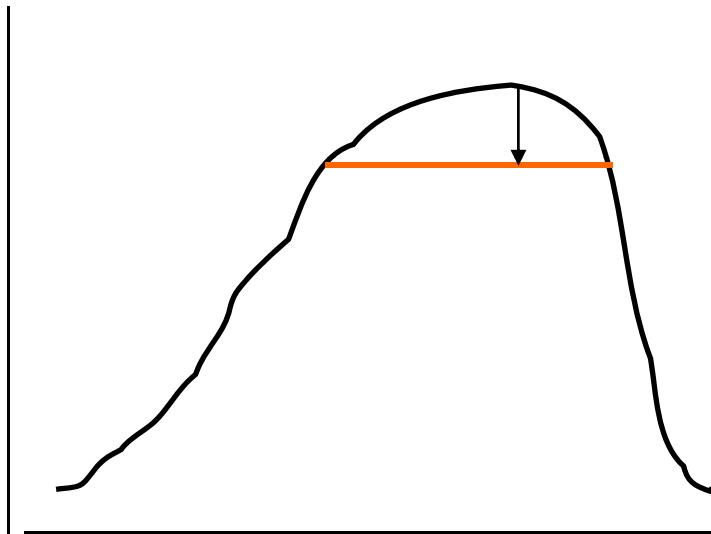
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Peak Clipping Strategy



Peak Clipping



Power Saver Programs:

A/C Cycling

W/H Cycling

Demand Response

Volunteers

Represent 36% of new DSM program mix

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Demand Response



Power Partner – Free Thermostats

SuperStat[®] Remote Programming Console
provided by **comverge**



Heat Mode SETTINGS **Cool Mode** SETTINGS **Vacation Mode** SETTINGS

► Start Times & Temperature Set Points
Use the form below to set the start time of each time period and input:

Primary Current Mode: Heat
Select a Day

Morning	Day	Evening	Night
Time <input type="text" value="6"/> : <input type="text" value="00"/> <input type="text" value="AM"/>	Time <input type="text" value="8"/> : <input type="text" value="00"/> <input type="text" value="AM"/>	Time <input type="text" value="5"/> : <input type="text" value="00"/> <input type="text" value="PM"/>	Time <input type="text" value="9"/> : <input type="text" value="00"/> <input type="text" value="PM"/>
Set Point <input type="text" value="70"/> °F	Set Point <input type="text" value="75"/> °F	Set Point <input type="text" value="70"/> °F	Set Point <input type="text" value="75"/> °F

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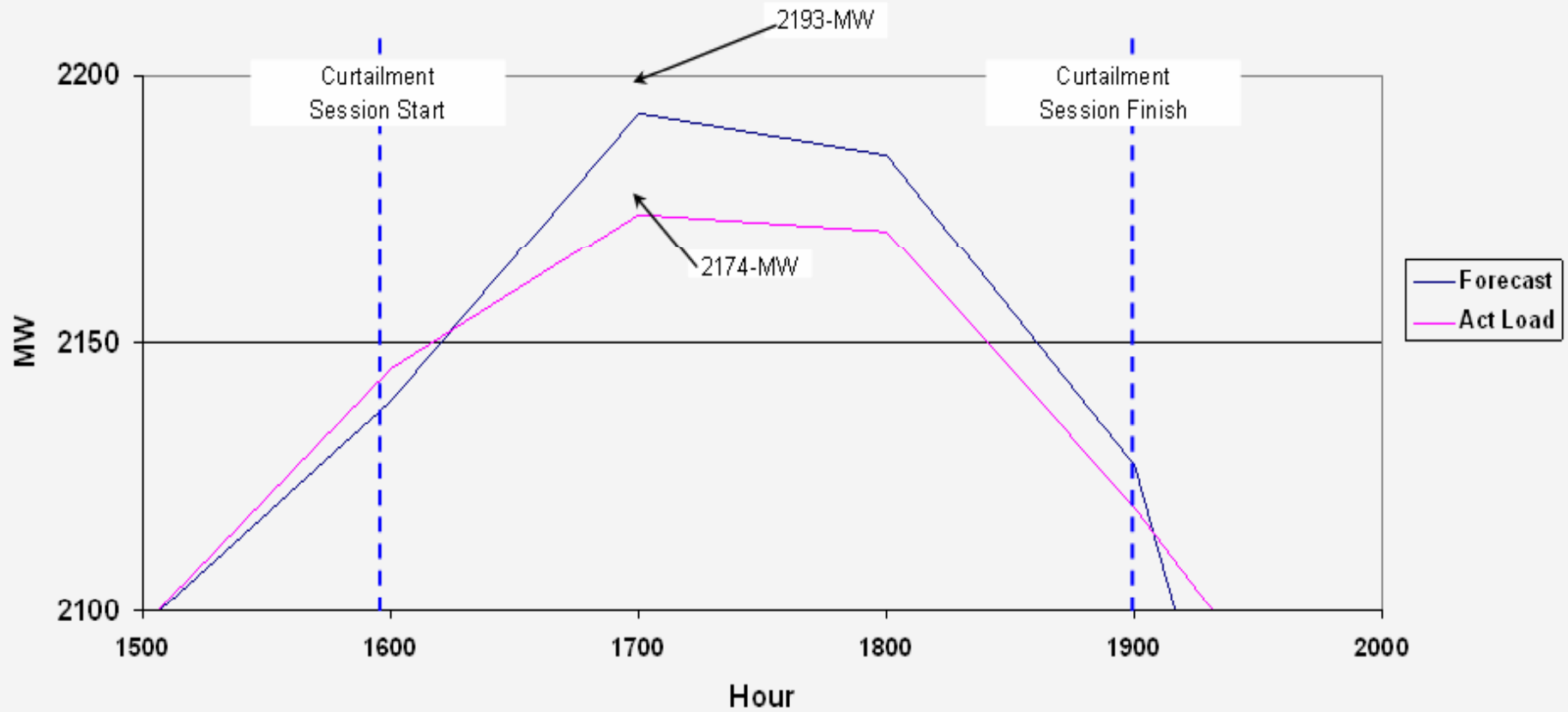


Peak Clipping Impact

Wednesday, June 15, 2005



Forecast vs Actual Load

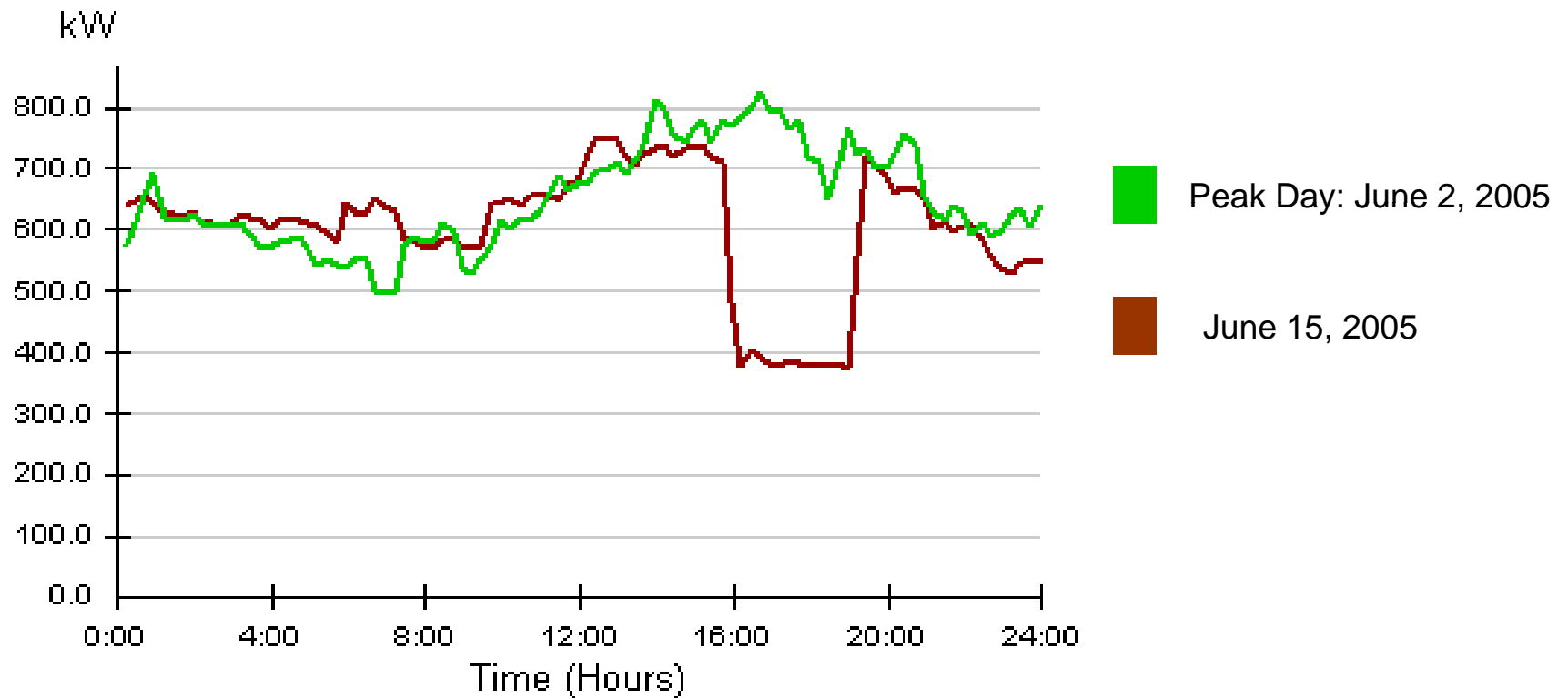


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Demand Response

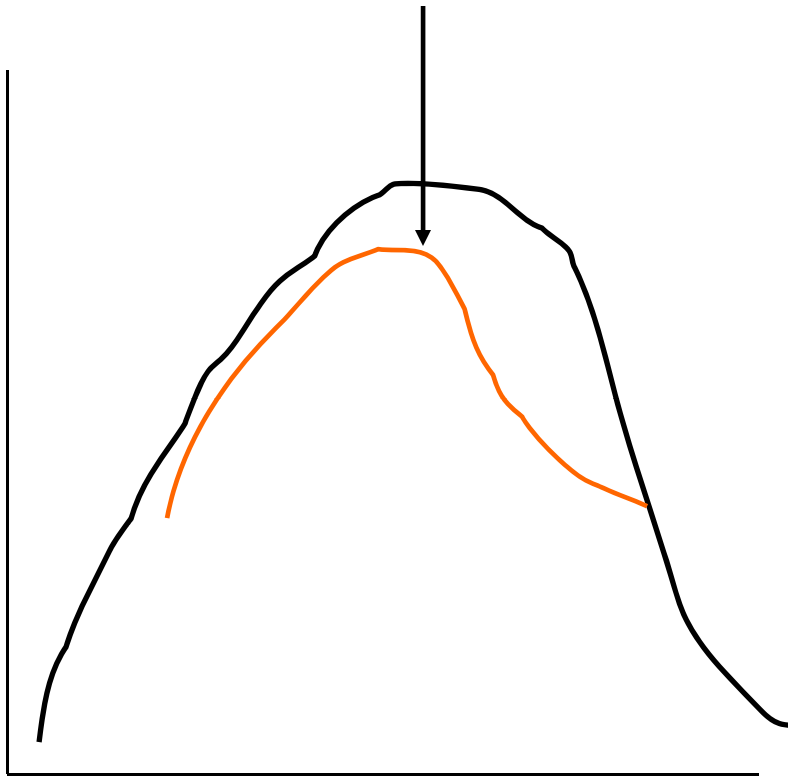
June 15, 2005



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Strategic Conservation



- ◆ Home Performance with ENERGY STAR®
- ◆ Small Business Efficiency
- ◆ Appliance Efficiency
- ◆ Multi-Family Rebates
- ◆ Commercial Rebates
- ◆ Refrigerator Recycling
- ◆ Free Weatherization
- ◆ Municipal Conservation
- ◆ Air Duct Sealing

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Strategic Conservation



HID to High Bay Fluorescent Lighting Retrofit

Converted (25 each) 400-watt HID lamps to 4-lamp 240-watt T5 Fluorescents

- Annual Cost Savings: \$2,130
- Project Cost: \$5,973
- Utility rebate: \$1,613 (27% of job cost)
- Payback was 2 years

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WARNING!



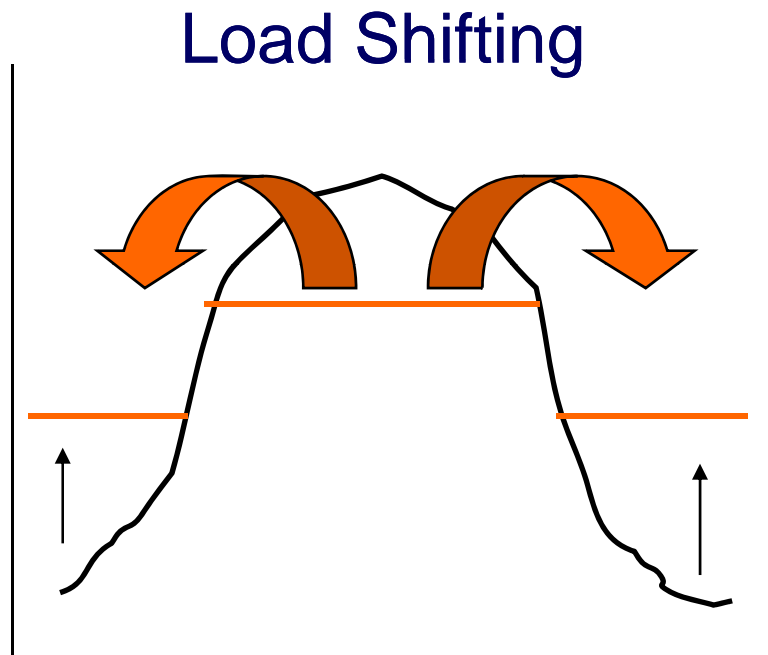
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Load Shifting Strategy



Time-of-Use Rate
Thermal Energy
Storage Systems

Represent 6% of new DSM program mix

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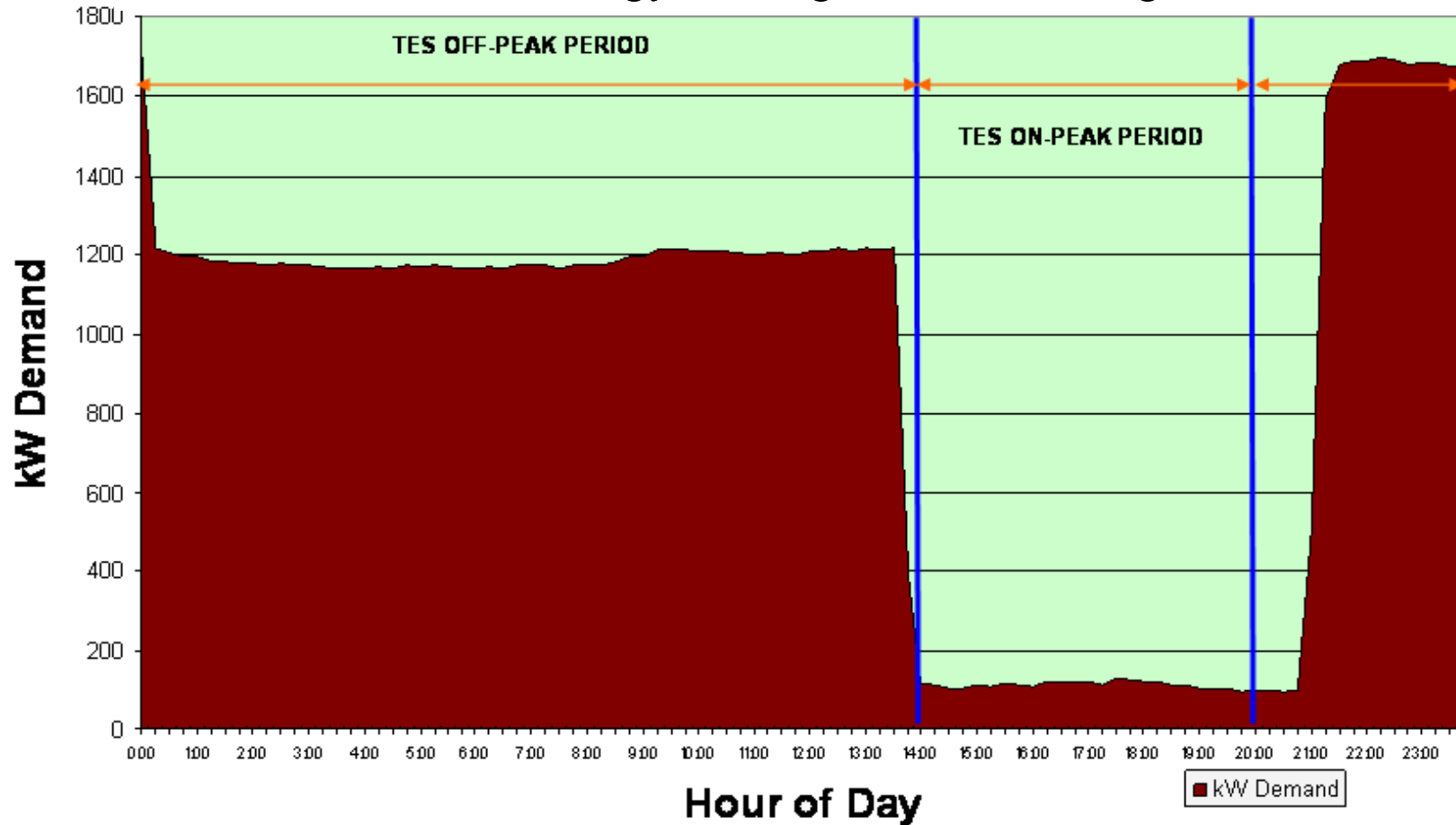
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Load Shifting



ABIA Thermal Energy Storage Profile – August 2000



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Closing

Energy Efficiency a Great Option for:

- ◆ Managing Future Load Growth!
- ◆ Creating Customer Loyalty!
- ◆ Providing Customer Solutions!

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Questions ?

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