“Utility Case Studies in Demand Response”

Tuesday, May 1, 2007

Webinar

Agenda

- Introduction to Demand Response
- Utility Case Studies
  - East River Electric Power Cooperative
  - City of Madison, South Dakota
  - Black Hills Power
- Questions and Discussion
- Future of Demand Response

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Introduction to Demand Response

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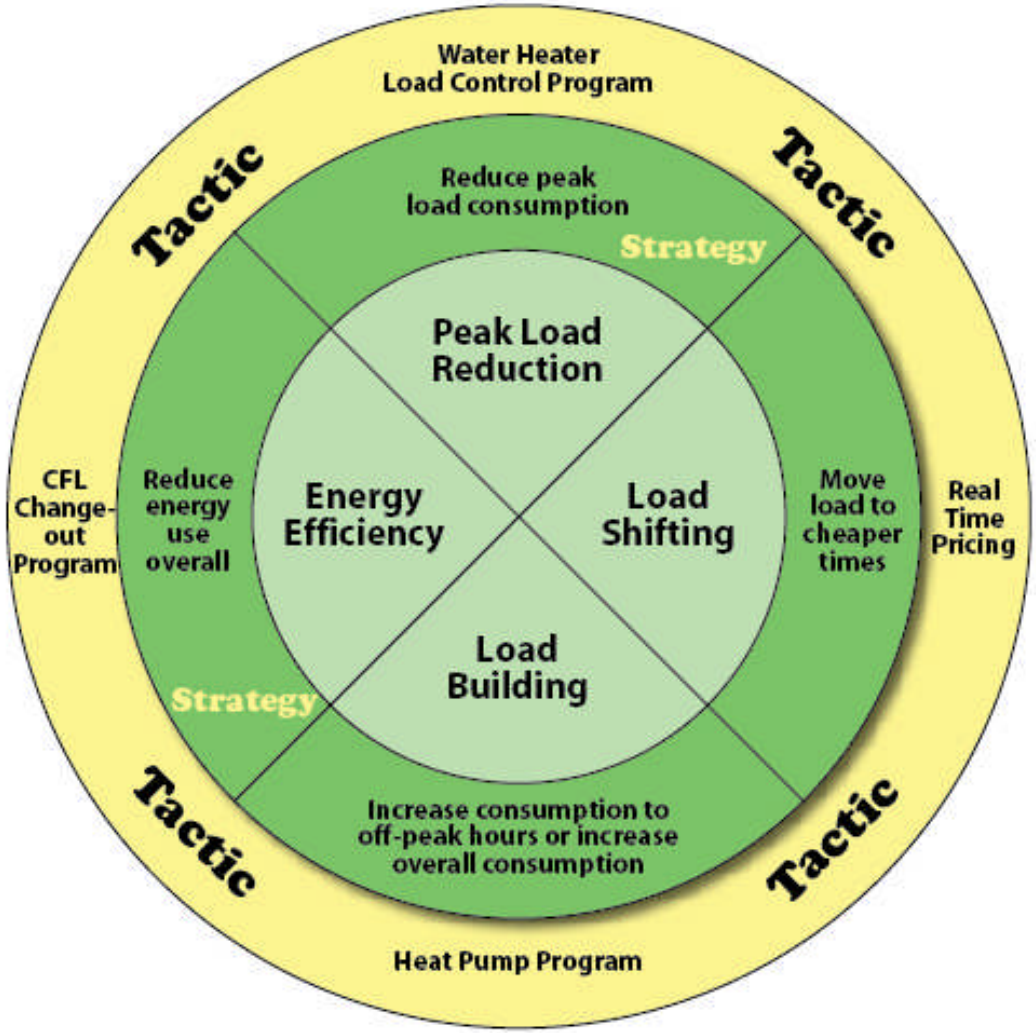
How Load Strategies Link to Program Tactics



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What are Utilities Doing?

- Aggressive promotion of demand response programs
- Building support for energy efficiency programs that promote peak load reductions
- Revising time-of-use rate structures

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Reasons for Demand Response

- Primary goal is to save capacity (kW)
- Program cost can be less expensive than new peaking generation or energy purchases
- Potential to change load requirements using price signals and customer incentives
- Provide flexible supply alternatives in an ever more complex world
- Increase service reliability
- Delay/avoid future rate increases
- Environmental stewardship

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Definitions

- Peak load occurs when a majority of customers use a large amount of electricity at the same time.
- Demand Response includes Load Control and Innovative Rates
- Load Control of various customer electric loads (i.e. water heaters, air conditioners & electric heat sources) during peak load times
- Innovative Rates designed to allow customers to understand and choose how much electricity they use during peak load times

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Demand Response Types

- Load Control
  - Interrupt
  - Cycle
  - Shift
- Innovative Rates
  - Demand
  - Interruptible

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Objectives

- Clip monthly peak demand charge
- Clip daily peak demand charge
- Delay new generation building
- Ease transmission constraints

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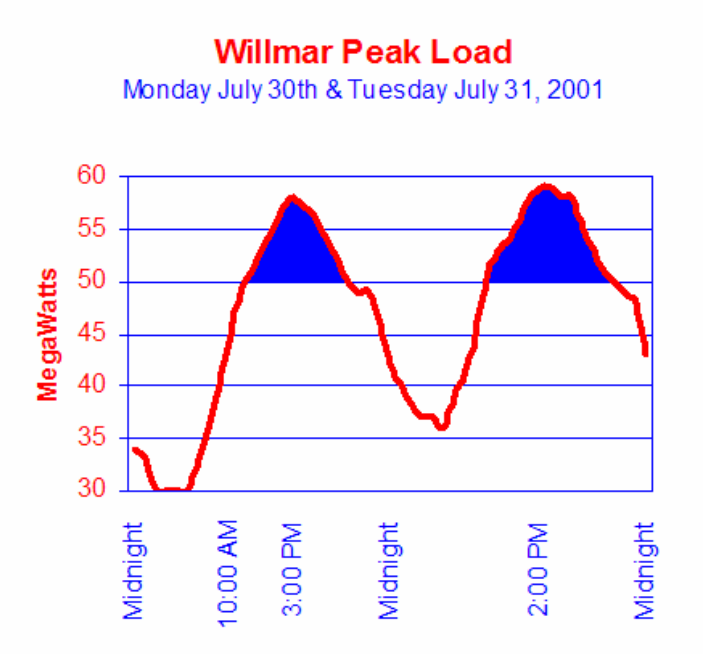
When?

- Extreme weather conditions
- Extreme power constraints/costs
- Every day



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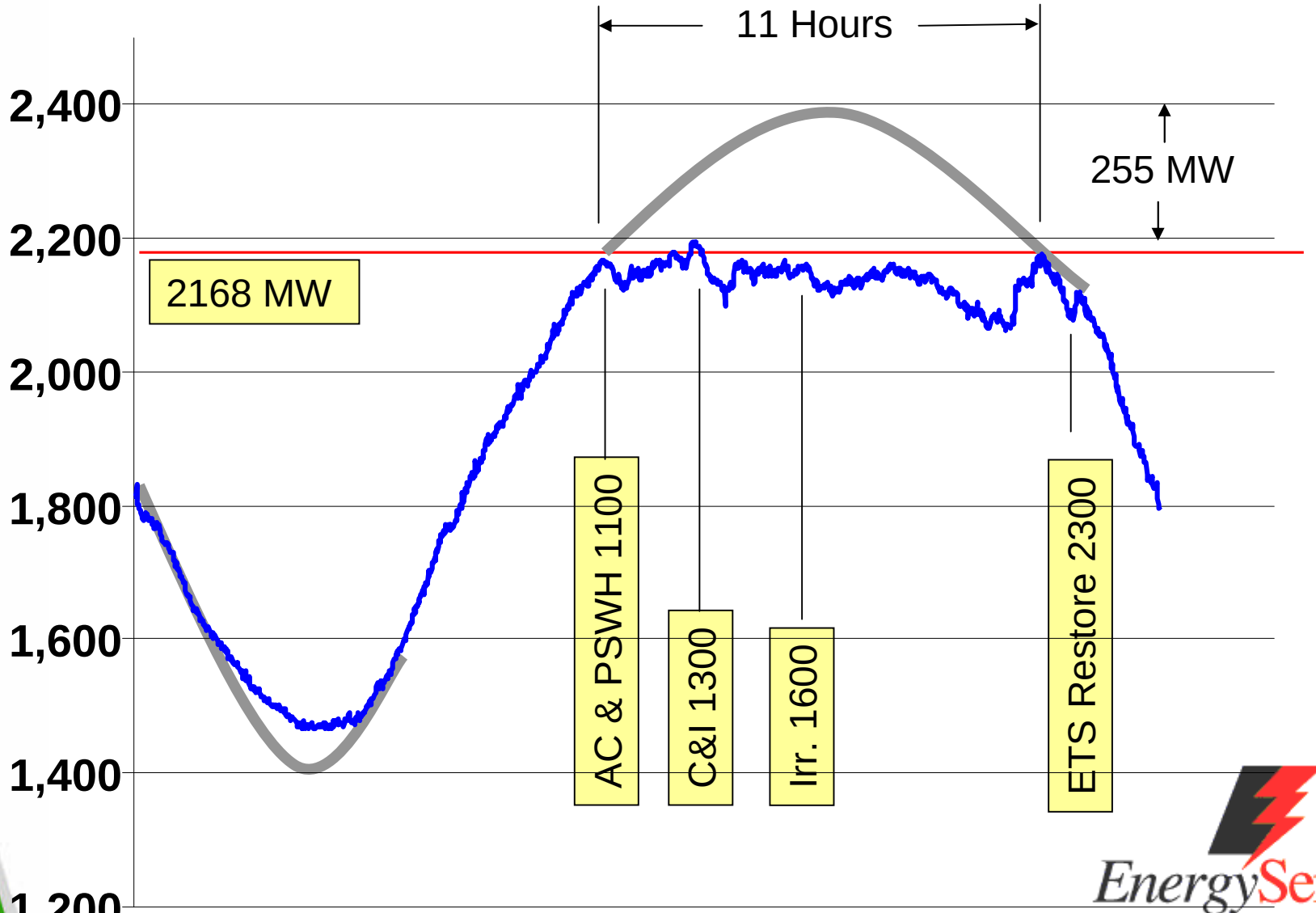
Great River Energy's Demand Response in Action



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Program Requirements

- End-use controls
- Communications Network
- Customer Interaction

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End-Use Controls

- Automated
- Manual

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Communications Network
One-Way and Two-Way

- Powerline
- Pager
- Telephone
- Internet
- Broadcast radio/tv

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Customer Interaction

- Education
- Recruiting
- Notification
- Incentive

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Utility Case Study: East River Energy Cooperative

- Operating for over 22 years and has saved almost $90 million in avoided wholesale power costs
- Over 60,000 different electric loads in eastern South Dakota and western Minnesota are connected to the system
- Operates the system on behalf of its member systems

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Program Design Strategy

- Demand Management objective
- Customer Segment targeted
- End Use targeted
- Decision-making drivers

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Implementation Tactics

- Customer incentive strategy/levels
- Promotion/Marketing/Recruitment activities
- Customer enrollment/fulfilment process
- Roles

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Program Results

- How measure success
- Evaluation and verification activities
- Program results to date

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Lessons Learned

- Key Success Factors
- Key Lessons Learned
- Planned Program Enhancements

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To Learn More

Utility Overview and Key Contact:

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Utility Case Study: City of Madison, South Dakota

- Offers incentives to customers who allow the utility to load-control their water heater, central and room air conditioners, and electric furnaces
- "Dual fuel" incentive is offered to customers with an auxiliary heat source other than electric
- Almost half of the utility's 3800 electric customers participate in the program

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To Learn More

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Utility Case Study:
Black Hills Power

- Offers "residential demand service" rate to for customers that average 1,000 kilowatt-hours (kWh) or more per month
- Customer purchases Demand Controller that monitors whole house electricity use and begins shutting off major appliances on a prioritized basis as demand reaches a preset kW limit
- Black Hills Power does not control usage

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To Learn More

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Future of Demand Response

- Can be proven least-cost resource
- Long-term commitment
- Communicate benefits and opportunities

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Prove to be Least-Cost Resource

- Deploy to help meet some portion of expected future growth
- Monitor and evaluate costs of existing demand response programs
- Target use of demand response to reduce peak demand and high-cost energy needs

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Long-Term Commitment

- Provide funding that is:
  - Sufficient
  - Timely
  - Stable

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Communicate Benefits and Opportunities

- Work to maintain balance between customer satisfaction and program optimization
- Buying the resource from customers creates:
  - Economic development benefit
  - Customer relationship enhancement

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