BPA Commercial & Industrial Demand Response Pilot Projects

Stakeholder Meeting #3

Spokane (August 10, 2010)

Presenters

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Today's Meeting Agenda

- Introduction
- Project Objectives & Process (Abbreviated Review)
- Technical and Infrastructure Overview
- Phase 2: Pilot Implementation Overview
- Other Topics
- Open Q&A session

Background: Why is BPA interested in DR?

- Hydropower system has met needs for years, but has increasing demands on system
  - Want to keep the system
    - Reliable
    - Flexible
    - Cost-effective (i.e. low rates)

- Why now?
  - Better to pilot strategies before capacity issues become critical
  - The 6th Power Plan stresses need for BPA to engage pilots; It's possible that the 7th Power Plan may have DR targets
  - There are many unknowns needing research regarding how to develop DR as a resource in Pacific Northwest

Pilot: Goals and Objectives

- Test DR strategies that provide value to BPA, customer utilities, and/or end users
- Successfully execute pilot projects with engaged partners
- Increase BPA's understanding about utility needs & considerations in regard to DR
- Share findings with customer utilities and other stakeholders

Key Drivers

1. Managing system loads during prolonged summer heat waves when river levels are lowest and electrical demands are very high due to cooling loads and/or irrigation needs
2. Managing system loads during winter cold spells when electrical demands are very high due to heating loads
3. Integrating growing wind generating resource and the associated challenges brought on by its variable availability
4. Mitigating effects of disruptions on the power grid due to generation unit outages or limitations
5. Integrating energy efficiency with demand response activities

Many ideas to configure, adapt or customize

Type of Pilot	Exmples of Pilot Options	Pilot Concepts
Integrated Load Management	Pilot 1	Load shifting in wastewater facilties by integrating EMS with process and control technologies
	Pilot 5	Integrated distributed resources (combines an optiomal mix of renewable resources, storage technologies, and load shed opportunities)
	Pilot 6	Thermal energy storage coupled with demand reduction
	Pilot 7	OpenADR, along with integrated EE/DR strategies in energy intensive industries such as refrigerated warehouses
	Pilot 8	Pricing mechanism (super peak TOU type) for C&I customers
	Pilot 9	Interruptible/curtailable for large C&I customers
	Pilot 10	Demand/capacity bidding with or without aggregators using OpenADR
	Pilot 11	Load shifting with thermal mass in large commercial buildings
	Pilot 12	OpenADR strategies for data centers
	Pilot 13	Air-cooled chillers with thermal energy storage replace water-cooled chillers
	Pilot 14	Off-peak non-road electric vehicle charging (e.g., fork lifts, golf carts)
	Pilot 15	Off-peak water pumping to gravity storage
Fast DR	Pilot 2	Fast DR for large C&I customers with Open ADR (events with response requirement less than 10 minutes)
	Pilot 4	Fast DR with small and medium C&I customers, with response requirement less than 10 minutes
Direct Load Control	Pilot 3	Direct load control for small and medium C&I customers using switch and PCT
Renewable energy integration	Pilot 16	Water pumping for reducing variability of renewable generation
	Pilot 17	Wind/PV-powered pumped water storage for electric energy storage
	Pilot 18	Wind/PV-assisted municipal water pumping and building water systems

Note: EMS = Energy Management System; DR = Demand Response; C&I = Commercial and Industrial; OpenADR = Open Automated Demand Response; PCT = Programmable Communicating Thermostat; EE = Energy Efficiency; TOU = Time-Of-Use; and PV = Photovoltaic

What does the process look like?

Begin

- Start with knowledge of your customers and of your utility's priorities
- Call Global for a short, high-level conversation to refine your ideas

Develop

- Develop the concepts into a proposal
- Global assists through in-depth phone consulting and on-site walkthrough

Commit

- Gain commitment from your utility management team and your customer
- Submit your proposal to BPA by Sept 30

For a more detailed overview of the recommended proposal preparation process, see slides 22 – 33 of the July 20 BPA C&I Demand Response Pilot Projects Stakeholder Meeting #2 Presentation and/or call Joshua Binus (503-230-5298).

Pilot Project Proposal Guidelines

- Award Information: 2-6 awards ranging from $100k-$500k
- Eligibility: BPA PF Customer Utility (slice or load following)
- Proposal Evaluation Considerations: (See PIP)
  - Meets basic eligibility and mandatory requirements
  - Project Approach clearly identifies information outlined Proposal Submission Guide
  - Technology is viable and ready within the pilot timeframe
  - Project is scalable to other end-users or utilities
  - Project team is clearly identified (including vendors)
  - Budget shows cost and value to BPA ratepayers
  - Cost-share is stated (can include in-kind staff support, equipment, M&V)
  - Commitment expressed by Utility Management / Board and by End-use Customer
  - At least one technology or objective is demonstrated and/or tested

Technical Issues Associated with Pilots

- OpenADR specifications
- DR events
- Real-time Data Feedback
- Baseline Measurement

Technical Issues: OpenADR Specifications

- For pilots demonstrating Auto-DR strategies with OpenADR architecture:
  - Ensure interoperability among technical components with open standard, platform-independent and transparent end-to-end technologies and/or software systems
  - The design of the pilot should consider the applicability of these technologies to specific industries or customer-segments, for which these types of pilots are being considered

Technical Issues: DR Events

- Encompasses all pilots
- The DR service provider will need to clearly define:
  - the conditions under which DR events are likely to be called (trigger for the DR event)
  - the number of times during the year events are likely to be called (frequency of events)
  - the average duration of events and method(s) for notifying customers of DR events (telephone, pager, email, etc.)
  - the time period for responding to events once they are called (day-ahead or day-of with specification on the response time)

Technical Issues: Real-Time Data Feedback

- Especially important for Fast DR and for ancillary services market loads
- Essential to obtain real-time feedback on load participation (for example at 4-second intervals)
- Will need appropriate metering and communications infrastructure

Technical Issues: Baseline Measurement

- Encompasses all pilots
- Customer baselines (customer loads outside of DR events) must be established to measure the load reduction impact
  - A few standard baseline measurement methodologies exist
  - Global can help identify what methodology may be most appropriate
- Pilot project methodology should be based on an assessment of the most widely accepted and commonly applied methodology.

Infrastructure Issues Associated with Pilots

- Valuation
- Marketing and Recruitment
- Customer incentives
- Validation procedures

Infrastructure Issues: Valuation

- Essential to establish a framework to define pilot project benefits and costs to assess cost-effectiveness
- Commonly used approaches will be adopted, keeping in mind specific regional conditions and priorities

Infrastructure Issues: Marketing and Recruitment

- Pilot marketing and recruitment strategies need to address a specific targeted customer segment
  - E.g. marketing and recruitment methods for large industrial customers are likely different from a group of smaller, aggregated restaurants
- Once pilot ideas are decided upon, need to define strategies

Infrastructure Issues: Customer Incentives

- Each pilot will need to outline a participant incentive structure and level
  - E.g. Direct Load Control (DLC) may offer fixed monthly incentives to participants during the operation season
  - E.g. Curtailment may offer a fixed payment ($/kW) to supply a certain amount of load during DR events, along with an energy payment ($/kWh) for actual event energy reduction
  - E.g. Mandatory curtailment may pay higher incentives than voluntary reduction
  - E.g. Customers may have the option of getting power at a reduced price during non-peak hours, but pay higher prices during peak demand

Infrastructure Issues: Validation Procedures

- There are well-established validation procedures to measure and verify actual load reduction during DR events and/or to measure load shift amount prior to DR events
- Procedures must be defined in the proposal and then established prior to implementation

Pilot Implementation: Phase 2

Phase 2 will begin as early as October 25, 2010

Key Activities

- Scoping
- Contracting Options
- Site Assessment
- Installation and Enablement
- Metering
- Testing and Validation
- Program Operations
- Data Collecting and Reporting

Pilot Implementation: Scoping

- BPA/Global DR Team will work closely with utilities, end-use customers and consultant/sub-contractors to prepare pilot project scope documents for clear expectations and deliverables
- Documents will include, but not limited to:
  - Specific pilot objectives
  - Detailed project plans to be executed by the consultant/sub-contractor
  - Detailed budgets and schedules
- BPA will review and comment on SOWs
- BPA/Global DR Team will work with utility staff to ensure a plan is in place to gather information useful to furthering regional DR knowledge

Pilot Implementation: Contracting Options

- BPA & utilities sign Memorandum of Agreement (MOA)
- Two contracting options for utility flexibility:
  - Contract with BPA (utility assumes responsibility & cost of project management)
  - Contract with Global, general contractor for BPA (Global responsible for project management; BPA shoulders cost of project management)
- The contracting option will ultimately be chosen by the customer utility

Pilot Implementation: Site Assessment

- BPA/Global DR team to conduct site surveys to:
  - better understand end-use customer's existing conditions, equipment configurations, and load shed desires during events
  - identify all of the possible the DR measures that would bring about load reductions
  - estimate the load shed amount
- Team members to talk with customer about potential energy efficiency opportunities they may want to consider prior to DR equipment acquisition

Pilot Implementation: Installation/Enablement

- Complete equipment installation and enablement for load reduction during DR events
- Participating end-use customers may require existing system technical infrastructure modifications
  - BPA/Global DR team available to assist end-use customer(s) with modifications
  - Specific solutions will vary based on:
    - customer size
    - type of equipment that is currently in place
    - preferred DR measures to be taken

Pilot Implementation: Metering

- Vendor may install a new or utilize/modify an existing metering system to communicate load management data.
- BPA/Global DR Team will use data for the following:
  - to monitor participating loads in real-time before, during and after each DR event
  - to potentially settle the load reductions following each DR event, to serve as basis for compensating customer for participation in event
- After vendor establishes a site load data connection, BPA/Global DR Team will tailor monitoring and tracking systems to fit validation requirements and provide load reduction performance data to customer for incentive settlement

Pilot Implementation: Testing & Validation

- BPA/Global DR team to conduct a series of functionality tests to validate that systems are operational and capable of effectively modifying loads as desired for pilot testing
- BPA/Global DR team will use previously agreed upon baseline methodologies to estimate DR event load reduction

Pilot Implementation: Program Operations

- Operate DR pilot program, assess operations and tailor approaches, and adjust program design as needed
  - Notify customers of pending DR events
  - Resolve customer issues
  - Monitor DR event performance in near-real time and reporting back to BPA through web-monitoring systems
  - Undertake customer training and communications/ outreach activities through regular e-newsletters or other efficient media
  - Monitor, track and report usage and DR event load performance
  - Make warranted adjustments to maximize performance
  - Undertake settlements and payment processing related activities

Other Topics: Data Collection & Reporting

- Future DR programs may be supported by data collected on:
  - Recruitment Process
  - Implementation Process
  - Programmatic Issues
  - Technology Issues
  - Utility and End-use Customer Satisfaction
  - Lessons learned
  - Cost-effectiveness
  - Event Impact Measurement

Other Topics: Next Steps

- This is the third and final stakeholder meeting
- Question & Answer session: 8/18 10-11 AM PST
  - Covering proposal process
  - Conference call only: 877-278-8304 PIN 3992
  - Please submit questions to Theresa Hughes (tchughes@bpa.gov; 503-230-5341), BPA contracting officer (with a cc to Joshua Binus, jdbinus@bpa.gov) by COB Friday Aug. 13; a summary of the Q&A to be sent following the call
- For Global support: Plan ahead to minimize scheduling issues
  - Utilities that fail to take advantage of Global's technical support may disadvantage themselves (compared to those utilities who have already been engaging Global's help with pilot prioritization, site visits, etc.)

Questions and Answers

For more information contact:

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