



National Action Plan for Energy Efficiency

[www.epa.gov/
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Coordinating Energy Efficiency & Demand Response

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Leadership Group Meeting



Project Overview

- Background: Year Action Plan Year Two Work Plan
 - “Expand scope of Action Plan to additional DSM options.... Particular focus will be to determine how to incorporate energy efficiency (EE) and demand response (DR) in complementary ways such that customers have increased tools... to understand and manage and reduce their electricity use”
- Approach
 - Prepare “scoping study” on coordination of EE and DR
 - Synthesize existing literature and interviews with sample of program administrators, service providers and large customers



Scoping Study: Outline

- 1) Executive Summary
- 2) Introduction
- 3) Relationship between EE and DR
- 4) Customers' Views on EE/DR Coordination
- 5) Program Administrators & Service Provider Views on EE/DR Coordination
- 6) Lessons/Conclusions



Definitions of Demand Response Vary

- 2006 Action Plan Report recognizes value of DR :
“The term energy efficiency as used here includes using less energy at any time, including at times of peak demand through demand response and peak shaving efforts.”
- 2006 DOE report to Congress
“[DR can be defined as] changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.”



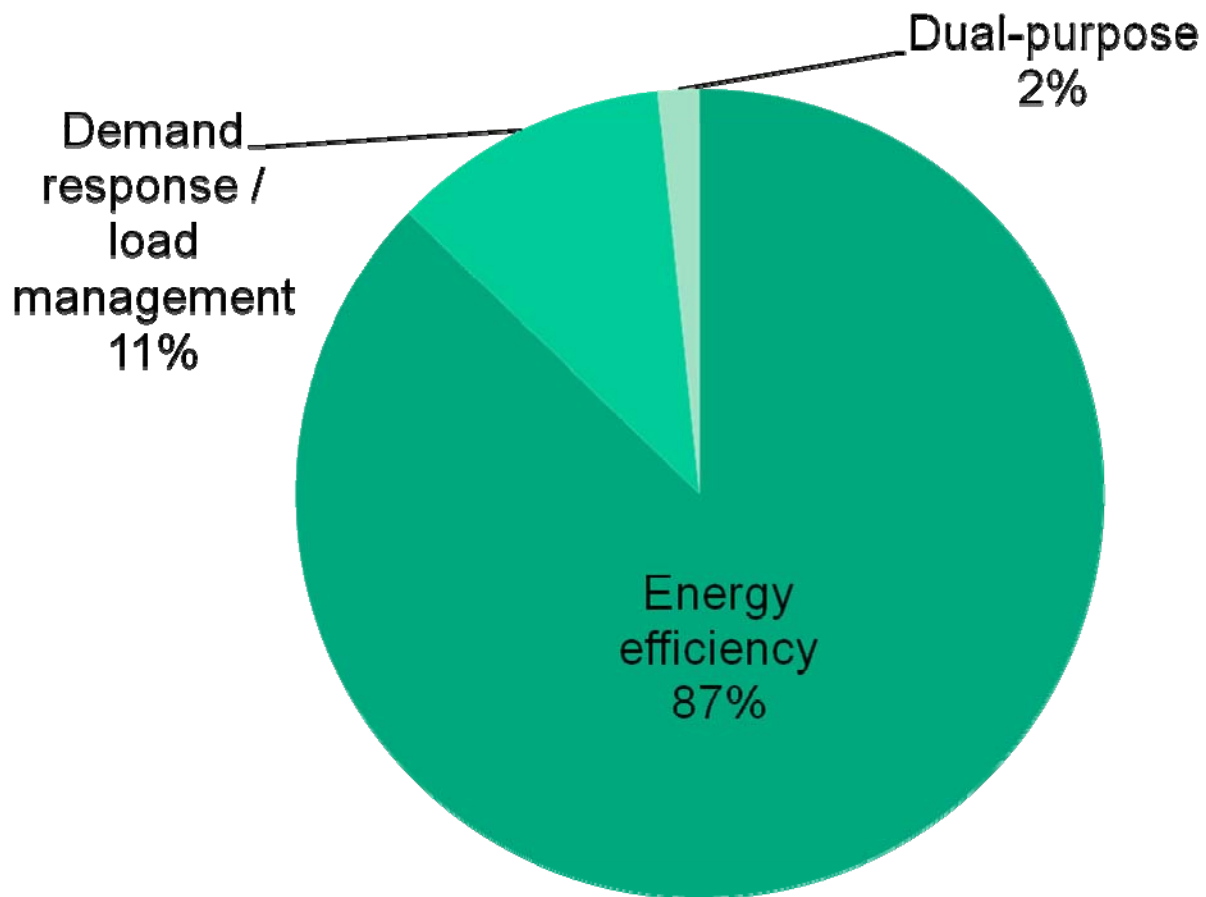
A Continuum of Options

	Energy Efficiency	Load Management	Demand Response
Frequency	Daily	Daily	Event-driven (80-100 hours/year)
Motivation	<ul style="list-style-type: none"> • Energy savings • Environmental protection 	<ul style="list-style-type: none"> • TOU savings • Peak demand savings 	<ul style="list-style-type: none"> • Reliability • Price signals or other incentives
Supporting Infrastructure	<ul style="list-style-type: none"> • Energy-efficient design and equipment 	<ul style="list-style-type: none"> • Energy-efficient design and equipment • Building and process controls 	<ul style="list-style-type: none"> • Building and process controls • Communications systems • Standby generation
Customer Actions	<ul style="list-style-type: none"> • Operations and maintenance 	<ul style="list-style-type: none"> • Limiting loads • Shifting loads 	<ul style="list-style-type: none"> • Limiting loads • Shifting loads • Shedding loads • Displacing grid power
Initiation	<ul style="list-style-type: none"> • Customer 	<ul style="list-style-type: none"> • Customer 	<ul style="list-style-type: none"> • Distribution utility • ISO

Adapted from Piette (2007)



Few Programs Explicitly Serve Multiple Purposes



Source: 1,451 active electric DSM programs in E Source's DSMdat™ database



Coordination of EE and DR Can Mean Many Different Things

Internal Coordination

- Coordinating assessments of potential and establishment of goals
- Funding both out of the same pool of dollars
- Housing both within the same part of the organization
- Making program managers and account reps responsible for both

External Coordination

- Marketing jointly
- Linking program eligibility requirements
- Providing unified technical assistance
- Incentivizing installation of equipment with dual benefits
- Delivering seamless packages of EE and DR



Customer Interviews

Industry	Number
Chemicals	1
Commercial real estate	1
Government	1
Financial services	1
Grocery	1
Primary metals	1
Retail	3
Telecommunications	1
Higher education	1



Customer Experience with DR Is Broad but not Deep (1)

Company	DR Experience
Chemicals manufacturer <i>>3,700 MW load in multiple states</i>	One facility participating in DR; 24/7 operations preclude curtailments at most facilities
Commercial property owner/mgr. <i>>100 facilities, 38 million sq. ft.</i>	One building in DR, primarily due to a good relationship with the local utility
Government agency <i>20 million sq. ft. in four states</i>	A few buildings in a DR program in one utility service territory
Financial services company <i>20 million sq. ft. in 30 large facilities</i>	Limited experience with curtailment using standby generator at one site
Grocery chain <i>~2,500 stores and distribution centers</i>	Participates in DR in Northeast via standby generators and lighting reductions
Primary metals manufacturing <i>(Trade association)</i>	Almost all major facilities on a curtailable rate or participating in wholesale market DR



Customer Experience with DR Is Broad but not Deep (2)

Company	DR Experience
Retail chain (a) <i>~1,000 stores and distribution centers</i>	No DR; already raising AC set points on hot days to save money
Retail chain (b) <i>~2,500 stores and distribution centers</i>	Recently signed up for DR via aggregator in one state; no curtailment experience yet
Retail chain (c) <i>>4,000 stores</i>	Participating in 16 utility and ISO DR programs, generally via aggregators
Telecommunications company <i>>1,500 facilities</i>	Some DR participation in Northeast via standby generators; 24/7 loads
University <i>11 million sq. ft; large cogeneration plant</i>	Standby generator at central utility plant is in a DR program



What We Heard from Customers (1)

- DR itself, not coordination, is the big issue
 - Money offered often isn't worth the hassle
 - The patchwork of programs is challenging
 - Difficult to reach kW thresholds
 - Customer comfort is our priority
 - We can't curtail essential tenant services
 - We already raise set points on hot days to save money—so we don't have any more to give during DR events.
 - “Demand response is what the utilities desire, not what the market is demanding.”
 - But: Industrials strongly favor broad application of dynamic pricing



What We Heard from Customers (2)

- “We prefer to focus on energy efficiency”
 - EE helps us all the time
 - EE provides environmental benefits
 - Given scarce capital, EE takes priority because it provides better paybacks
 - EE benefits persist, whereas DR programs may be transient
 - “If everybody got one percent more efficient, demand response would be totally unnecessary.”
- Utilities’ technical assistance is of limited value



Utility Interviews

- Ameren
- Austin Energy
- Avista Utilities
- Con Edison
- Duke Energy
- Gainesville Regional Utilities
- Otter Tail
- PG&E
- Pepco Holdings
- PNM
- Progress Energy
- SDG&E
- SMUD
- Southern Company
- United Illuminating
- Xcel Energy



What We Heard from Utilities (1)

- Many utilities report that internal coordination is adequate
- In some jurisdictions, regulation discourages EE/DR coordination
 - Separate proceedings, rules, budgets, and goals set direction for utilities
- Policymakers and stakeholders tend to focus on energy efficiency
- Training and incentivizing staff to deliver both EE and DR is challenging
- Vendors specialize in EE or DR, not both



What We Heard from Utilities (2)

- Customers want seamless solutions that reduce their energy bills—EE/DR distinctions are unimportant
 - Is the name “demand response” a deterrent?
 - Some utilities adopting an EE label for everything
- There is a pressing need for customer education
- AMI will likely be a turning point



What we heard from ISOs (1)

- ISO-NE (6 states; 28,130 MW)
 - Forward Capacity Market
 - 2007 auction: 2,483 MW of new Demand Resources qualified
 - Five types of Demand Resources: on-peak, seasonal peak, critical peak, real-time DR, real-time emergency generation
 - Qualified Capacity: 590 MW of EE (i.e. on-peak and seasonal peak) and 735 MW of DR
 - Impact on EE/DR Coordination
 - Significant new business opportunity for Project Sponsors (CSPs, ESCOs and utilities)
 - But ISO-NE requires separate bids for each resource type
 - Project Sponsor can offer combined package to customer
 - Large existing customer base with control technologies used for EE
 - encourage use of enabling technology for both EE and DR



What we heard from ISOs (2)

- PJM (13 states; 144,644 MW)
 - Capacity Market (Reliability Pricing Model)
 - In December 2006, FERC orders PJM to incorporate energy efficiency into their Capacity Market
 - Reliability Pricing Model (RPM) is a price-competitive process for acquiring capacity resources
 - Proposal under development and being considered by PJM Working Groups
 - Impact on EE/DR Coordination
 - Large potential impact because of size of PJM market: Business opportunity for EE/DR Service Providers
 - Stay tuned for details on final proposal



ESCOs and Curtailment Service Providers (CSPs)

- Historically, active in either EE (ESCOs) or DR (CSPs) but not both
- Some ESCOs and CSPs beginning to “dip toes” in new programs (and markets)
 - Some ESCOs exploring DR services (include alliances with CSP)
 - CSP acquired EE services company
- Both ESCOs and CSP leverage enabling technology assets and relationship with customer to explore new opportunities
- Both identify lack of customer awareness as an important barrier—although once the customer is “educated,” it is easier to sell other products



What we heard from CSPs (1)

- Historically, marketing done from DR perspective
 - “DR is foot in the door...”
 - DR product offerings differ depending on market structure
- DR and EE are not yet well-coordinated
 - But product offering is evolving towards total energy management (DR and EE)
 - Organizationally, both are being brought together
- DR focuses more on customer behavior (“relationship-type business”) while EE focuses on technology (“project-type business”)—not clear how both can work together



What we heard from CSPs (2)

- Regulatory/Policy Barriers (to DR)
 - Some state PUCs and stakeholder groups mainly interested in kWh savings, not kW
 - Recommend: explicit kW savings goals
 - Financial disincentives for utilities to procure DR (compared to building peaking units)
 - Valuation and C/E screening methods often do not reflect full value of DR resources
 - Narrow focus of programs discourages broader participation of DR resources
- Institutional/Market Barriers (to DR)
 - Lack of customer awareness—“An educated customer is a more reliable resource”
 - New EE projects can reduce potential for DR (affects Customer Baseline)



What we heard from ESCOs

- Historically, marketing done from EE perspective
 - EMCS capable of providing EE, peak load management and DR services
 - “DR is still a niche market”—not large enough to get in
- Barriers
 - Gap between EMCS technology design and possible use for DR purposes
 - Rarely optimized and automated for DR
 - Initial customer awareness of DR opportunities are low
 - Issues in adapting ESCO Performance Contracting model to DR
 - Assessing and managing performance risk
 - Learning curve for dealing with ISO/RTOs markets
 - Corporate culture of some ESCOs (product technology companies)



Questions for Leadership Group

- Defining DR and EE? Reconciling varying definitions?
- Scope of DR options to focus on in this study (e.g. include DG, dynamic pricing)? Should we narrow scope to event-based DR?
- Coordination of EE and DR: Which topics/areas to emphasize (e.g. customer interface issues, issues internal to program sponsors/service providers or regulatory)?
- If we conduct additional interviews, which group should we focus on?
- Among customers, important groups or segments missed that we should target for interviews?
- Given newness of issue and relatively small sample size (~35 interviews), “scoping study” or “white paper”?
- Should we include real-world examples from interviews, and if so, what should they focus on, given limited experience and confidentiality concerns?
- What would “best practice” look like for coordination of EE and DR?



For Further Information



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