Incentive Mechanisms for Leveraging Demand-Flexibility as a Grid Asset

An Implementation Guide for Utilities and Policy Makers

Executive Summary accompanying the full written report

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Background
Demand flexibility is an increasingly valuable, but underutilized resource

Utilities and market operators can use **demand flexibility for supply/demand balancing** via demand response (DR)

Buildings that can **respond quickly and reliably are the most desirable** for supporting reliability, power quality, and low-cost service

The **need for low-cost grid-balancing assets is rapidly increasing** as the integration of inflexible and/or intermittent generation resources (e.g., solar PV) accelerates

Some **state regulations and policies undervalue or limit** the use of demand-flexibility as a valuable grid asset
Objective
This implementation guide serves utilities, policymakers, and customers

This guide serves the following audiences to:

**Primary**
- **Utilities**
  - Understand different financial incentive mechanisms and DR options
  - Help build underlying strategy for new financial incentives

- **Regulators and policy makers**
  - Build a framework for understanding and justifying support for demand-flexible building incentive mechanisms
  - Identify policy and regulatory opportunities to expand use of demand flexibility as a grid resource

**Secondary**
- **Building owners (i.e., customers)**
  - Understand available financial incentive mechanisms that could bring in new revenue
  - Identify technical and operational considerations to support preparation and implementation of demand-flexible operational plans and agreements
Approach and Purpose

Approach:

1. Characterize the demand-flexibility ecosystem:
   – Value proposition for demand flexibility
   – Relevant operational characteristics
   – Goals of the key stakeholders

2. Analyze the financial incentive mechanisms available via three DR options:
   – Price-based DR
   – Retail DR
   – Wholesale DR

3. Provides perspective on approaches for operational planning and contracting by illustrating the link between:
   – Stakeholder goals (item 1)
   – DR options & financial incentive mechanisms (item 2)

Purpose:

To serve utilities and policymakers as they seek to appropriately, equitably, and sustainably incentivize building owners and operators to invest in demand-flexible technologies and operational strategies and actively participate in demand management and demand response.
Incentive Mechanisms
Incentives and associated DR options drive demand-flexible behaviors

Customer-initiated behavior changes to optimize around pricing and rate structures

Compensating customers with bill credits or off-bill payments for curtailing load when called upon or via direct utility control

Emergency capacity, reserves, and other wholesale market products providing off-bill payments for customer curtailment

Source: Guidehouse
Value Proposition
Demand-flexible provides three value dimensions

**Cost Savings**
- Reduce operating and fuel costs
- Defer/eliminate need for:
  - New generation assets
  - Transmission and distribution infrastructure

**Reliability and Grid Flexibility**
- Mitigate reliability issues (e.g., short term generation shortages or severe congestion)
- Maintain power quality

**Greenhouse Gas Abatement**
- Reduce the use of peaking power plants (highest emissions rates)
- Support expanded use of carbon-free generation
Market
Demand flexibility is well established in many areas, but underutilized

By the numbers:
• ~60 GW of Retail and Wholesale DR potential in 2018
• 200 GW* market potential in 2030 assuming:
  – Modernized program design
  – Expansion of auto-DR (e.g., smart thermostat)
  – Improved policies, standards, regulations (see right)

Additional Limitations:
• Lack of wholesale power markets in all regions
• Regulatory disincentives and opt outs
• Suboptimal technology platforms and processes
• Inconsistency

## Stakeholder Landscape
Alignment of stakeholder goals is critical to incentive design

<table>
<thead>
<tr>
<th>Goal</th>
<th>Description</th>
<th>Stakeholder</th>
</tr>
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<tbody>
<tr>
<td>Reliability</td>
<td>Protection from grid outages</td>
<td>X</td>
</tr>
<tr>
<td>High Power Quality</td>
<td>Maintaining appropriate voltage and/or frequency</td>
<td>X</td>
</tr>
<tr>
<td>Resource Adequacy</td>
<td>Sufficient capacity to ensure power availability for peak periods</td>
<td>X</td>
</tr>
<tr>
<td>Cost Reflective</td>
<td>Alignment with actual costs incurred to provide utility service</td>
<td>X</td>
</tr>
<tr>
<td>Predictability</td>
<td>Consistency and ability to anticipate bill savings</td>
<td>X</td>
</tr>
<tr>
<td>Bill/Cost Savings</td>
<td>Customer OR utility ability reduce costs</td>
<td>X</td>
</tr>
<tr>
<td>Maximize Revenue</td>
<td>Utility opportunity to generate revenue</td>
<td>X X</td>
</tr>
<tr>
<td>Occupant Satisfaction</td>
<td>Comfort and productivity of people in the building</td>
<td>X</td>
</tr>
<tr>
<td>Payment Structure</td>
<td>Comfort with the way in which billing/payments occur</td>
<td>X</td>
</tr>
</tbody>
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Note: This list is not exhaustive and only shows those goals that pertain to Incentive Mechanisms. Other notable goals are identified in the report but not discussed because they are independent of demand flexibility.
# Opportunities

Barriers to broader use of demand flexibility highlight key opportunities

<table>
<thead>
<tr>
<th>Incentive Mechanism</th>
<th>Opportunity to Improve Access and Value of Demand Flexibility by Supporting:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Cutting</td>
<td>1. [All Incentive Mechanisms] Improved consistency and standardization across regions – See below</td>
</tr>
<tr>
<td></td>
<td>2. [Rates/Markets] Progressive state regulatory frameworks and business models focusing on resiliency, reliability, GHGs</td>
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<tr>
<td></td>
<td>3. [Programs/Markets] Modernization of IT and processes including enrollment, data sharing, and M&amp;V</td>
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<tr>
<td>Rate Structures</td>
<td>4. Alternative/modern rate design</td>
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<tr>
<td></td>
<td>5. Increased consistency in rate design and rate structures</td>
</tr>
<tr>
<td>Utility Program Structures</td>
<td>6. Increased consistency in DR program design and implementation between utilities</td>
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<tr>
<td></td>
<td>7. Increased consistency of regulatory and policy treatment</td>
</tr>
<tr>
<td>Market Structures</td>
<td>8. Expanded reach of wholesale markets across entire US</td>
</tr>
<tr>
<td></td>
<td>9. Unified market treatment and/or DER treatment (e.g., FERC Orders 2222/2222-A) and market/service standardization</td>
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<td></td>
<td>10. Elimination of state opt-outs and enable consistent participation across jurisdictions</td>
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<td></td>
<td>11. Regulatory alignment of incentives with utilities to streamline participation</td>
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