



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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Authors:

Matt Guernsey (Guidehouse)
Margot Everett (Guidehouse)
Bill Goetzler (Guidehouse)
Theo Kassuga (Guidehouse)
Nicole Reed Fry (Guidehouse)
Rois Langner (NREL)

Reference: 209611

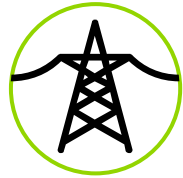
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Background

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:

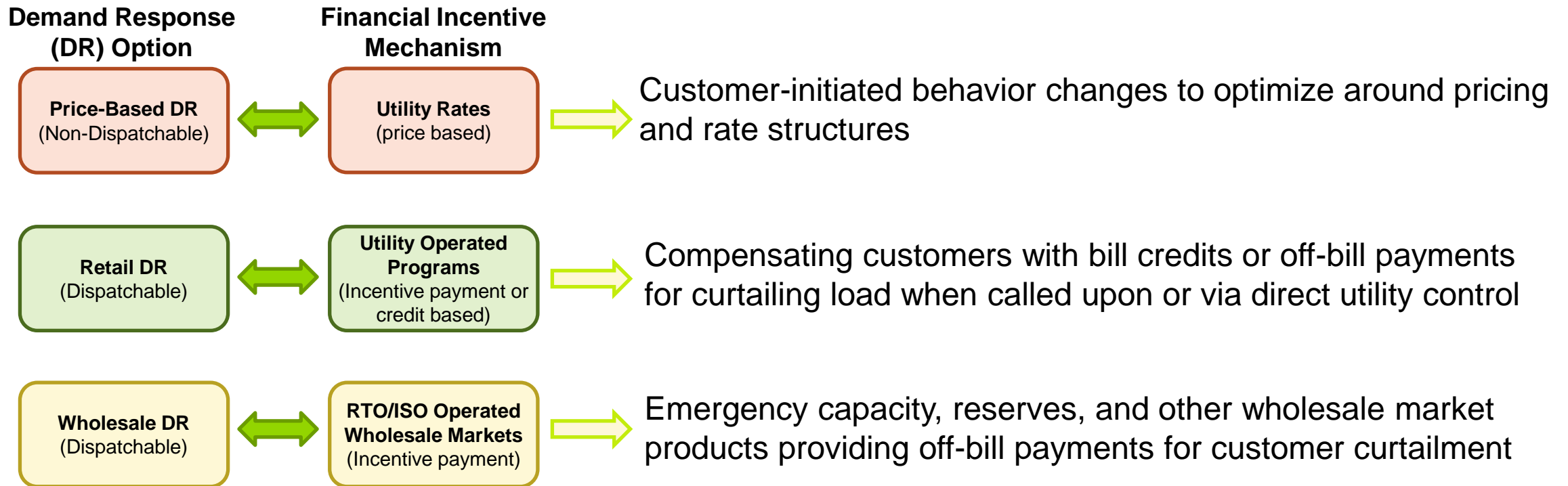
1. Characterize the demand-flexibility ecosystem:
 - Value proposition for demand flexibility
 - Relevant operational characteristics
 - Goals of the key stakeholders
2. Analyze the financial incentive mechanisms available via three DR options:
 - Price-based DR
 - Retail DR
 - Wholesale DR
3. Provides 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



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

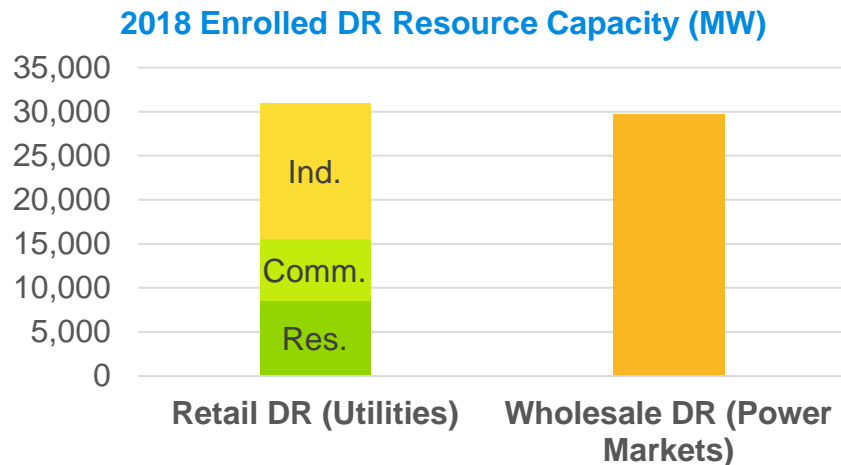
Demand flexibility is well established in many areas, but underutilized

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)

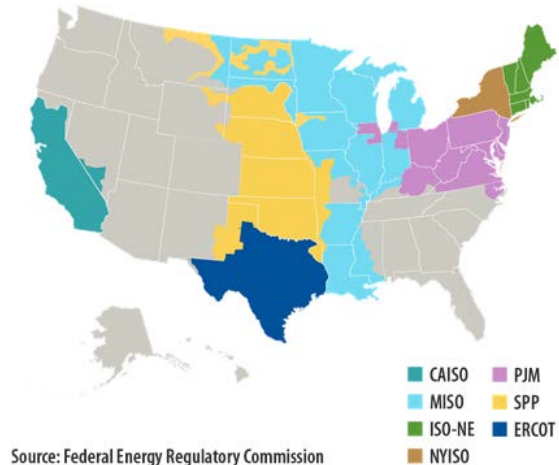
Additional Limitations:

- Lack of wholesale power markets in all regions
- Regulatory disincentives and opt outs
- Suboptimal technology platforms and processes
- Inconsistency



Source: FERC 2020 Assessment of Demand Response and Advanced Metering, Dec 2020

Wholesale Electric Power Markets in the US



Source: Federal Energy Regulatory Commission

Stakeholder Landscape

Alignment of stakeholder goals is critical to incentive design

Goal	Description	Stakeholder →	Regulator	Grid Operator	Utility	Aggregator	Customer	3 rd -Party Operator	Contractor
Reliability	Protection from grid outages		X	X	X				
High Power Quality	Maintaining appropriate voltage and/or frequency			X					
Resource Adequacy	Sufficient capacity to ensure power availability for peak periods			X					
Cost Reflective	Alignment with actual costs incurred to provide utility service		X		X				
Predictability	Consistency and ability to anticipate bill savings					X	X	X	X
Bill/Cost Savings	Customer OR utility ability reduce costs				X	X	X		
Maximize Revenue	Utility opportunity to generate revenue				X			X	
Occupant Satisfaction	Comfort and productivity of people in the building						X	X	X
Payment Structure Satisfaction	Comfort with the way in which billing/payments occur						X		

Source: Guidehouse

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

Incentive Mechanism	Opportunity to Improve Access and Value of Demand Flexibility by Supporting:
Cross Cutting	<ol style="list-style-type: none"> 1. [All Incentive Mechanisms] Improved consistency and standardization across regions – See below 2. [Rates/Markets] Progressive state regulatory frameworks and business models focusing on resiliency, reliability, GHGs 3. [Programs/Markets] Modernization of IT and processes including enrollment, data sharing, and M&V
Rate Structures	<ol style="list-style-type: none"> 4. Alternative/modern rate design 5. Increased consistency in rate design and rate structures
Utility Program Structures	<ol style="list-style-type: none"> 6. Increased consistency in DR program design and implementation between utilities 7. Increased consistency of regulatory and policy treatment
Market Structures	<ol style="list-style-type: none"> 8. Expanded reach of wholesale markets across entire US 9. Unified market treatment and/or DER treatment (e.g., FERC Orders 2222/2222-A) and market/service standardization 10. Elimination of state opt-outs and enable consistent participation across jurisdictions 11. Regulatory alignment of incentives with utilities to streamline participation

Contact

Matt Guernsey

Associate Director

matt.guernsey@guidehouse.com

(781) 270-8358

Margot Everett

Director

margot.everett@guidehouse.com

(415) 356-7104

William Goetzler

Partner

wgoetzler@guidehouse.com

(781) 270-8351

