

# Overview of Demand Response in ISO New England Markets

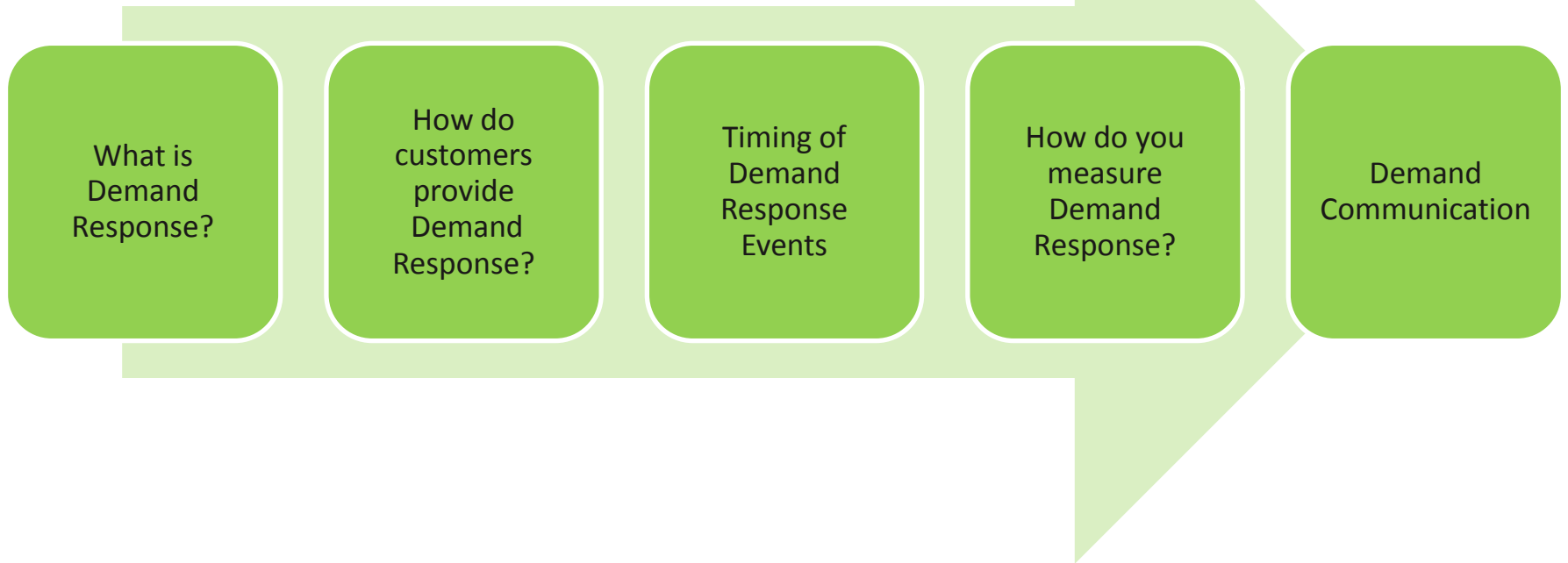
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# Topics Covered in this Module

## Demand -Side Management – Demand Response and Energy Efficiency

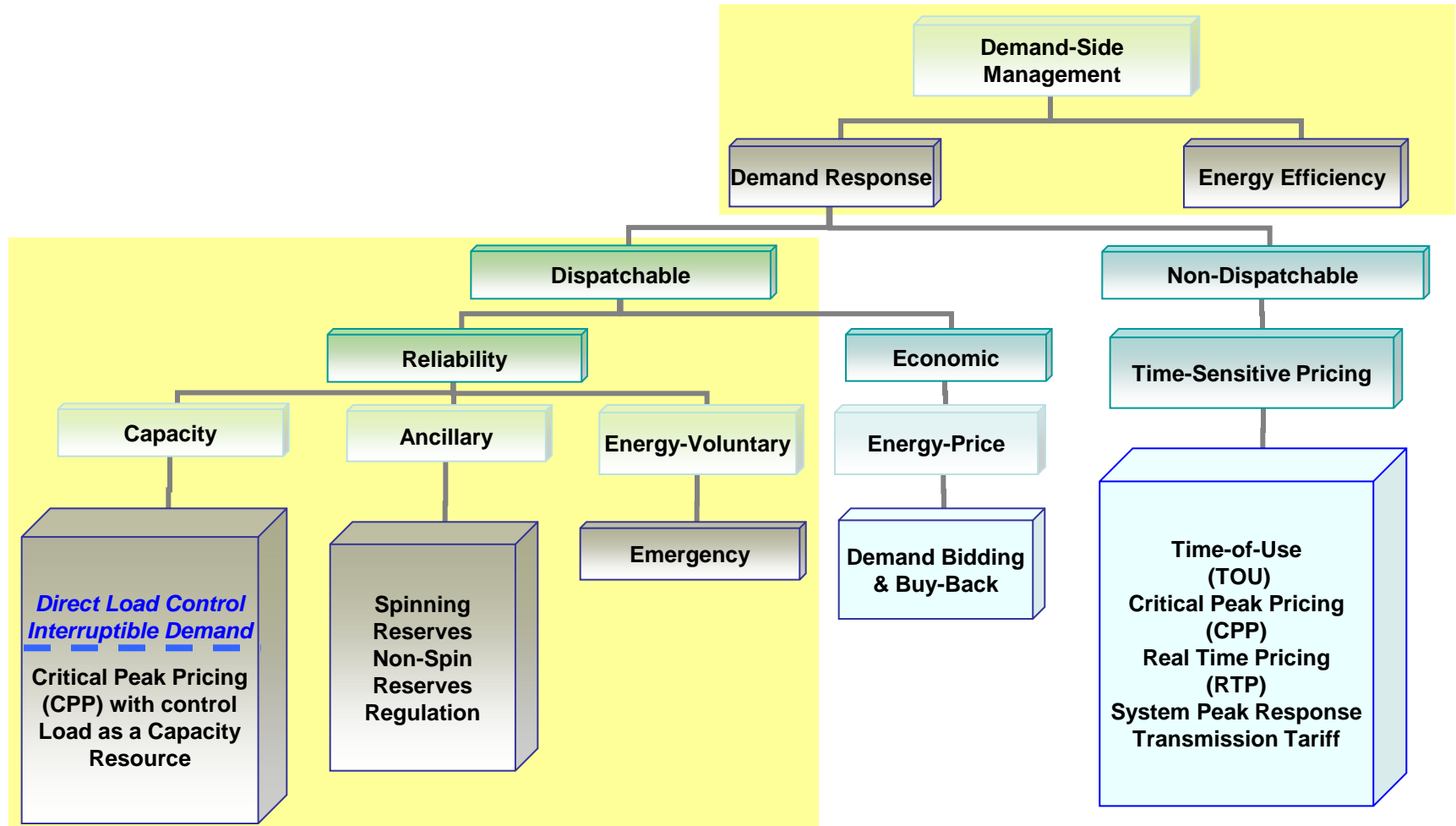


# Key Definitions



Term	Definition
Demand Resource/ Asset	<ul style="list-style-type: none"> <li>• A Load or aggregation of Loads capable of measurably and verifiably providing Demand Response.                             <ul style="list-style-type: none"> <li>- Demand Asset is level where load is measured.</li> <li>- Demand Resources in New England are groups of Demand Assets.</li> </ul> </li> </ul>
Demand Response	<p>A temporary change in electricity consumption by a Demand Resource in response to market or reliability conditions. For purposes of these standards, Demand Response does not include energy efficiency or permanent Load reduction.</p>
Baseline	<ul style="list-style-type: none"> <li>• A Baseline is a method of estimating the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event.</li> <li>• The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Reduction Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real-time or after-the-fact.</li> </ul>

# Demand-Side Management



# Demand Response Products

Term	Definition
Energy Service	A type of Demand Response service in which Demand Resources are compensated based solely on Demand reduction performance.
Capacity Service	A type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to provide Demand Response upon deployment by the System Operator.
Reserve Service	A type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction upon deployment by the System Operator, based on reserve capacity requirements that are established to meet applicable reliability standards.
Regulation Service	A type of Demand Response service in which a Demand Resource increases and decreases Load in response to real-time signals from the System Operator. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response Event timelines, deadlines and durations.

\*Definitions from North American Energy Standards Board

# What is Demand Response?

- Customers reducing their electricity consumption in response to either:
  - high wholesale prices
  - system reliability events
  - firm service obligations
- Customers being **paid** for performance based on wholesale market prices



# How Do Customers Participate?

- Reduce Electricity Consumption
  - Shut down a manufacturing process
  - Turn off discretionary lighting, motors, etc. (Active or Passive)
  - Raise HVAC temperatures (Active or Passive)
  - Use Lighting Controls (i.e., Dimming) (Active or Passive)
  - Use an Energy Management System (Active or Passive)
- Start Emergency Generator
  - Transfer load from the grid to an Emergency Generator
- Combination
  - Start up Emergency Generator and reduce load at the same time

# Typical Emergency Generator Configuration

*Operating During System Reliability Events (OP4 Action 12)*

Emergency Generator



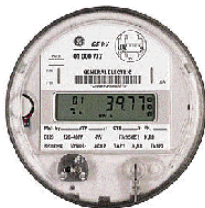
200 kW

1 MW Load



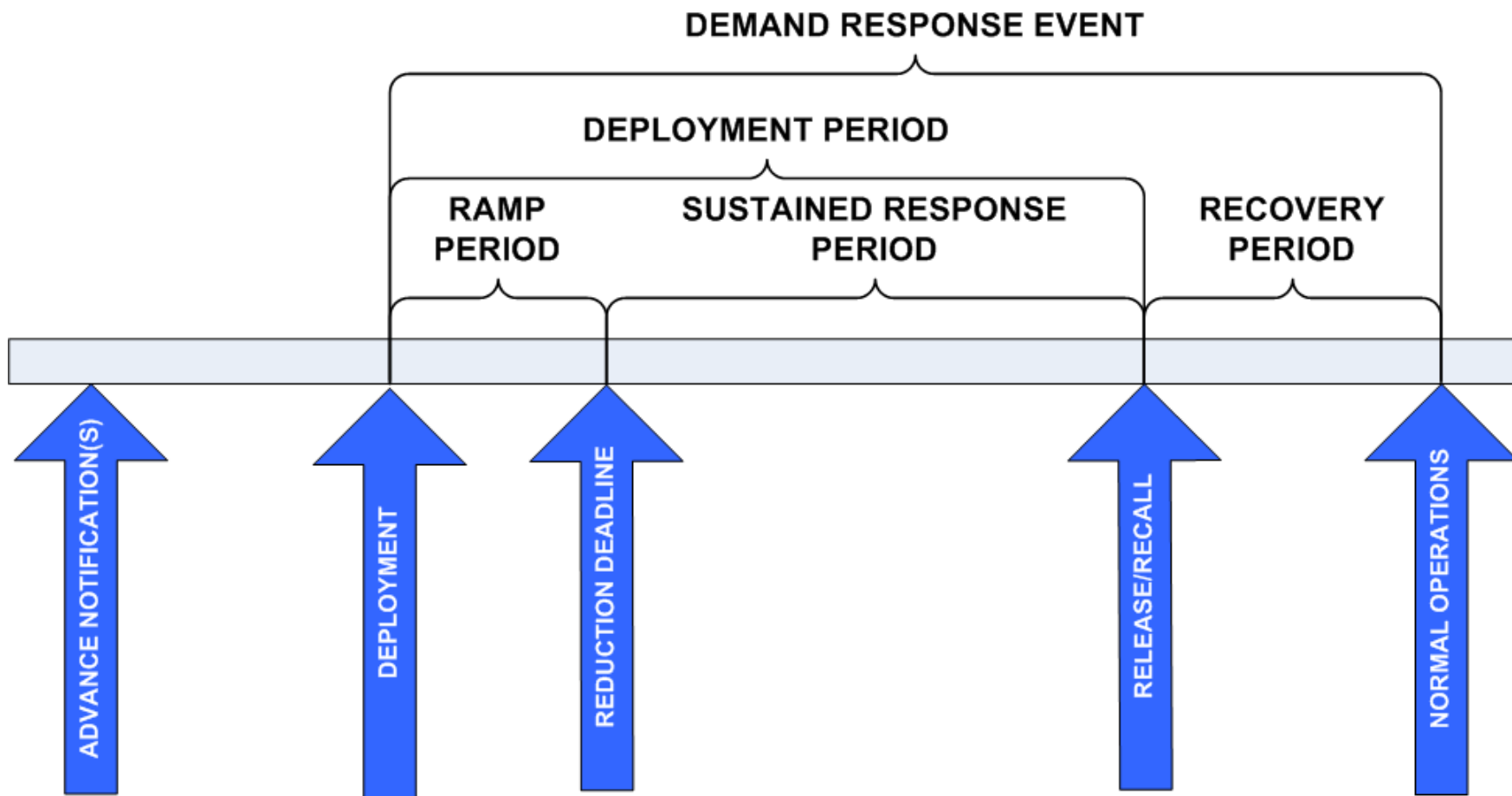
800 kW

Electricity Grid

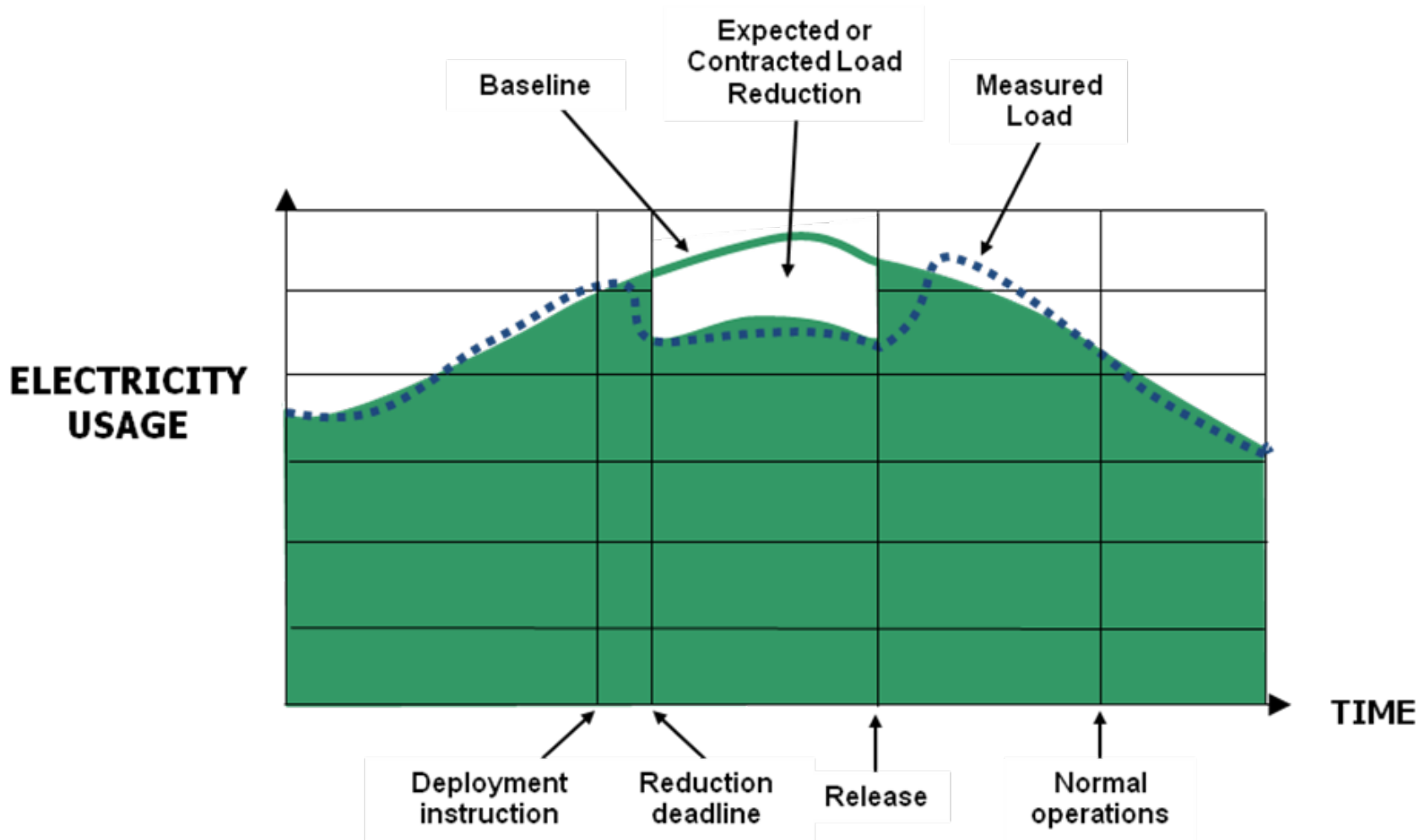


Metering reports 5-minute output to  
ISO New England

# Demand Response Event Timing

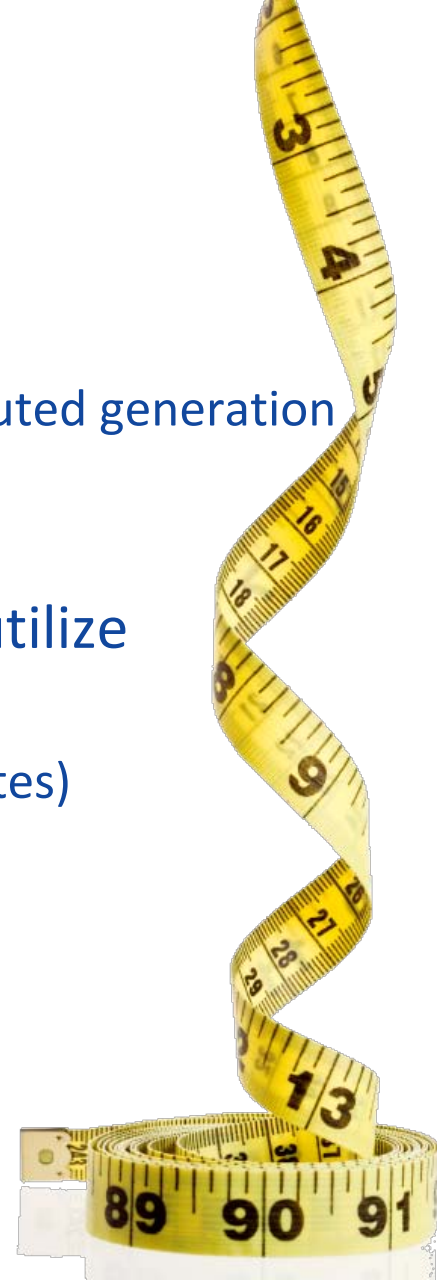


# Baseline Conceptualization

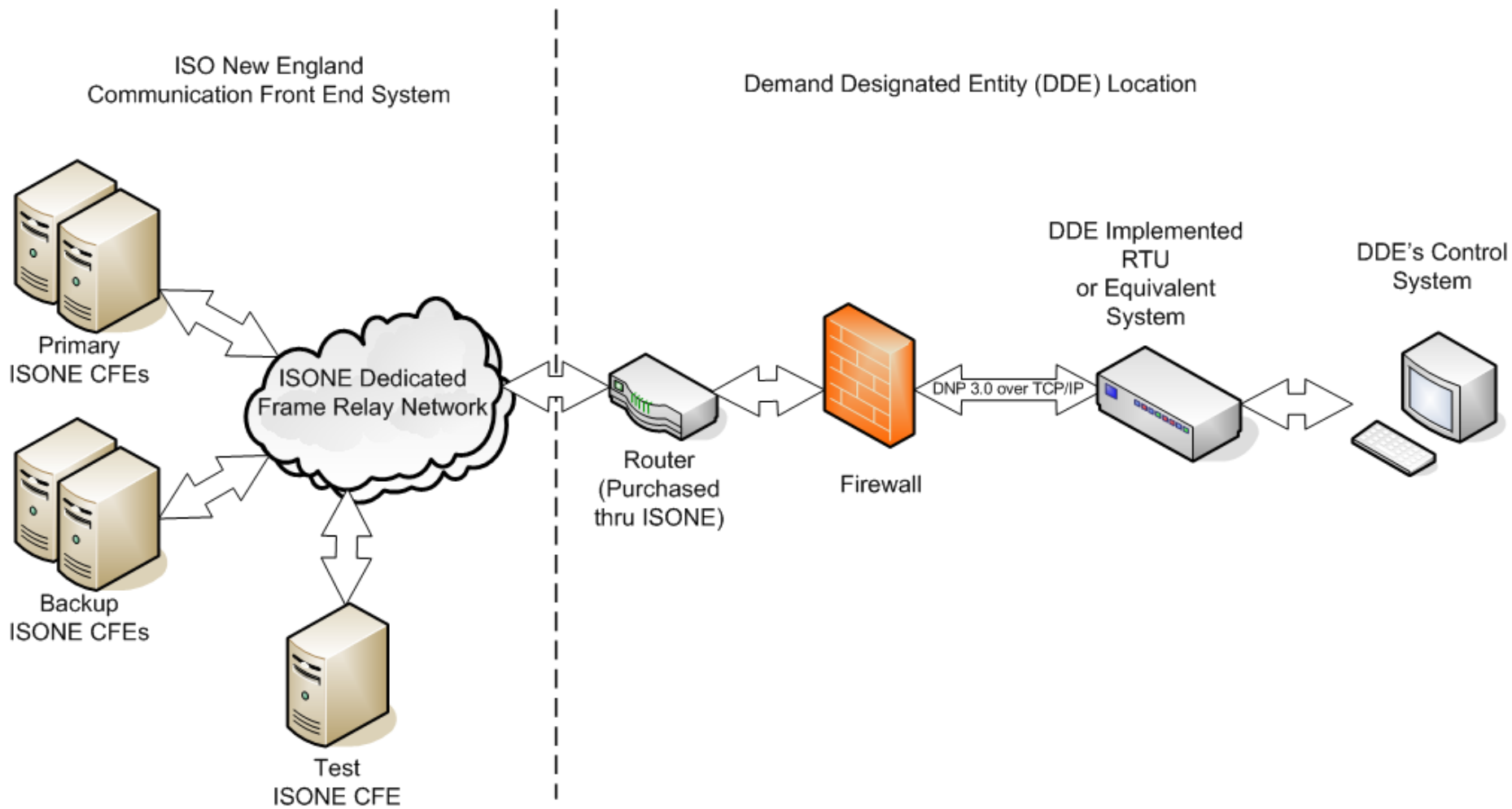


# Measurement and Verification for Metered Loads

- Metered loads include:
  - Demand response, emergency generation and distributed generation
- Utilize interval meter data
- Demand Response and Emergency Generation utilize interval data and Telemetry
  - Data is reported and collected near real-time (5 minutes)
  - Interval data is used to calculate baseline and DRV by ISO system software



# DR Dispatch Communication



# Energy Efficiency Demand Resource

1,000,000 bulbs



**Load**    60 MW        17 MW        7 MW

## Capacity Value

Replacement                      43 MW                      10MW

New Construction                                           10MW

# Passive DR Baseline Requirements

1

## **New Construction and Major Renovation**

- Applicable state code or Federal product efficiency standard, or
- Standard practices if there are no applicable state codes or Federal product efficiency standards, or

2

## **Replaced Failed Equipment**

Baseline condition shall be the nameplate rating of the equipment meeting the level of efficiency required by applicable state code, federal product efficiency standard, or standard practice, whichever is most stringent.

3

## **Replaced Operating Equipment**

Baseline condition is the kW load of that operating equipment across the performance hours.

# Measurement and Verification for Non-Metered Loads

- Measured Pre and Post installation
- Prescriptive measures use name plate ratings of new versus replacement equipment and some baseline measure
- Typically use impact studies to weight performance based on persistence rates, coincidence rates, free-ridership and spillover.
- Impact studies conducted by third parties employ a range of methods including interviews, field audits, and load research



