

# The Demand Resource

**demand side versus supply side**

Eligibility and Capacity Determination Working Group

July 13<sup>th</sup>, 2017

# Agenda

Summary

The demand resources

The value of demand resources

The success of demand resources – demand side vs. supply side

SAM 2.0 Proposal

# Summary

Demand resources on the supply side of capacity markets have proven to save customers billions of dollars

Market constructs with demand resources participating on the demand side or with no availability payment have minimal participation

ISO's are reconfirming the value of demand response as a valuable resource on the supply side

**Recommendation: Customers should have the choice to participate on the demand side or the supply side of the capacity market**

# The demand resources

Customers are more engaged and the emerging resources are leading to more decentralized grids

## Demand Response – DR

- changes in electric usage by end-use customers from their normal consumption patterns in response to changes in price of electricity over time, or to incentive payments
- Load curtailment, behind meter generation, behind meter storage

## Energy Efficiency – EE

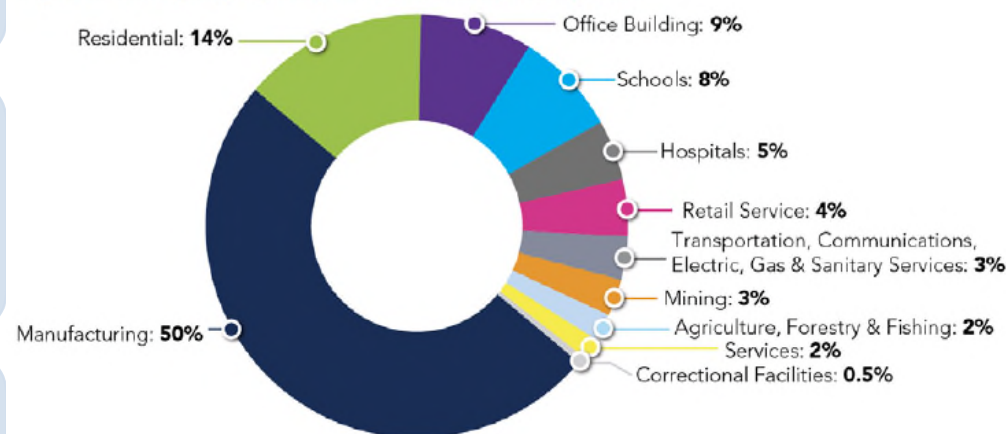
- reduces the amount of energy required to provide products and services
- Replacement of inefficient equipment in businesses (rebates), lighting retrofits, online rebates for appliances, home improvement incentives

## Distributed Energy Resources -- DER

- Generated or stored by a variety of small, grid-connected devices
- Typically renewable resources (small hydro, biogas, biomass, geothermal), battery storage, demand response

## Who participates in PJM?

Figure 2. DR Capacity Capability for 2015/16 Delivery Year by Sector



**Thousands of MW  
unlocked with supply  
side participation**

# The value of the demand resource

## A cost effective resource:

- Demand on supply side has proven to reduce capacity prices:
  - **PJM**
    - \$11.8 B in savings for 2013/2014 delivery year by DR/EE offering into RPM
    - 73% decrease in capacity price for 2017/2018 delivery year by DR/EE participation (IMM for PJM)
  - **ISO-NE**
    - \$1.4 Billion increase capacity costs in FCA 8 if demand response was removed from results (Mass AG/Consumer Advocate)

# The value of the demand resource

## A clean resource

- Carbon free resource (load curtailment DR, EE)
- Ability to displace inefficient older generation
- Having the resource in the province will assist with emission goals and new EE goals
- Assist with renewable integration
  - California - renewable integration value = \$500 million by 2025 (LBNL)
  - ERCOT, MISO, PJM study – reduce emissions by 10% by quickening resource transition mix from fossil fuels to RE (Navigant)

# The value of the demand resource

## A flexible resource

- Able to respond quickly – already participates in AESO OR
- Dispatchable demand = useful tool for control room during coal phase out and variable generation integration

## A reliability resource

- 3 GW during 2014 polar vortex (non-compliance period) in PJM
- 127% of DR contracted for in ERCOT during polar vortex

## A timely resource

- Ready for 2021 delivery year

# The success of the demand resource

Success of the demand resource and the value that comes with its participation depends on the right market structure and the right incentives

The Demand Side vs. the Supply Side:

- **PJM** – Price Responsive Demand (PRD):
  - First 10 years no MW in PRD (~500 MW for 2020/2021 delivery year procured in 2017)
  - Yet thousands of MW on the supply side (7,508 MW for 2020/2021 delivery year)

Availability Payments

- **NYISO** – Day Ahead DR Program (DADR):
  - No participants in energy payment only
  - 1000 + MW in the capacity auctions



# The success of the demand resource

## Participation requires the right incentives = Capacity Payments

- “This financial benefit is the major reason why DR participation in the capacity market as a supply resource has been so robust compared with other markets”. PJM DR Strategy 2017

## Analysis of US DR programs by NERA:

- Programs with availability payments have substantially higher take rates vs. programs with ‘economic market’ payment
  - Capacity Programs 4.8 M customers compared to 1.5 M customers for Economic Programs
  - Overall participation rates – 7.1% for capacity programs compared to 1.9% for economic programs

# The success of the demand resource

## PJM

- DR Strategy Paper released June 28<sup>th</sup> 2017 – Path Forward
- “DR should remain as a supply-side resource in the capacity and ancillary service markets. This approach is a more effective way for customers to manage these costs and for the wholesale market to incorporate these load-reduction actions”

## ISO-NE

- Full integration of Demand Response into the Day Ahead and Real Time energy markets and co-optimized to provide energy and OR in the most efficient manner – February 2017
- “Once Demand Response Resources are integrated into energy and reserves markets, all dispatchable resources can be treated comparably in the FCM”

# SAM 2.0 recommendation

Demand and supply side participation in the electricity markets should be complimentary

Should co-exist to allow for consumer choice and enable efficient energy system

## Eligibility Section 7.2 Proposal

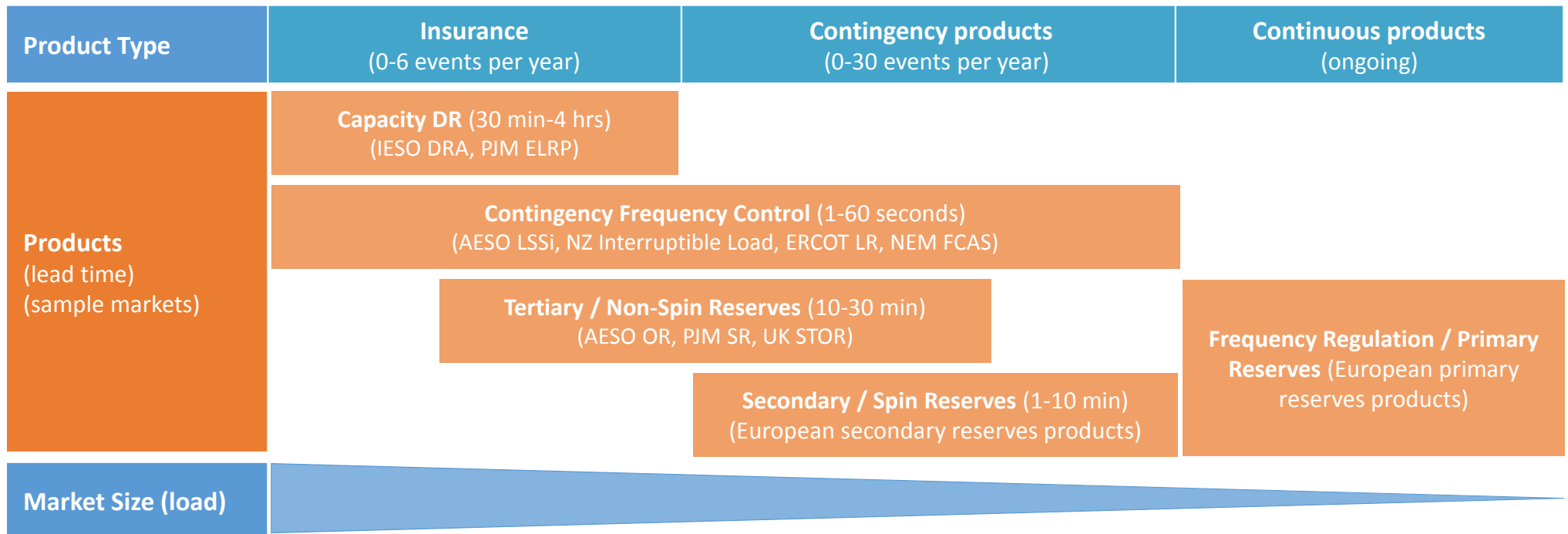
*The starting point is that demand based resources will be eligible to participate on both the demand side, by submitting a bid on the capacity demand curve, or on the supply side by securing a capacity obligation through the Forward Capacity Auction*

# Sources

- Monitoring Analytics, Independent Market Monitor for PJM – Base Residual Auction Analysis, July 2010; October 2014, August 2016
- Slope Comparison for System-Wide Capacity Demand Curves – presentation Power Supply Planning Committee, June 30, 2014
- <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451541>
- [http://www.ieca-us.com/wp-content/uploads/Carbon-Dioxide-Reductions-from-Demand-Response\\_Navigant\\_11.25.14.pdf](http://www.ieca-us.com/wp-content/uploads/Carbon-Dioxide-Reductions-from-Demand-Response_Navigant_11.25.14.pdf)
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- <http://pjm.com/~media/library/reports-notice/demand-response/20170628-pjm-demand-response-strategy.ashx>
- <http://www.nera.com/publications/archive/2013/effective-use-of-demand-side-resources-the-continued-need-for-a.html>
- PRD Conforming Changes: DR Full Integration – presentation to ISO-NE Markets Committee, February 7, 2017

# APPENDIX

# The Spectrum of DR's participation



# Example: PJM Demand Response

Figure 4. DR Capacity Commitment (RPM & FRR) Over Time

