



Distributed Energy Resources Roadmap Update

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MIWG

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Krey Corporate Center - Rensselaer, NY

Agenda

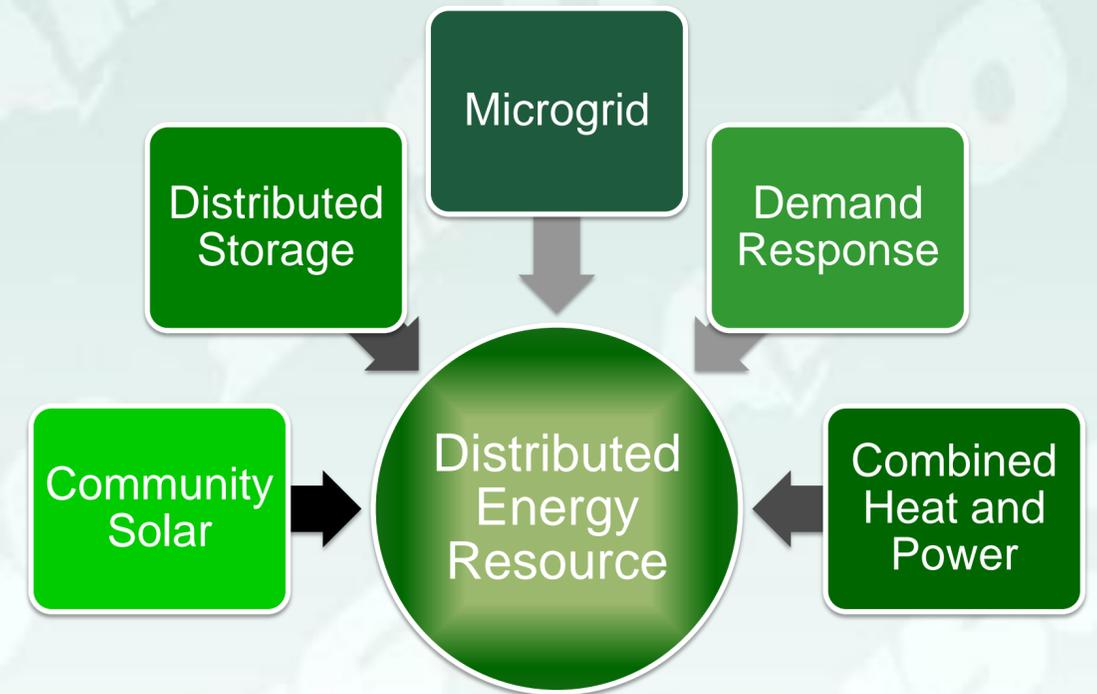
- **Purpose of Today's Meeting**
- **Initiative Scope and Key Objectives**
- **DER Roadmap Development Process, Discussion, and Timeline**
- **Stakeholder Presentations**
- **Summary of Feedback Received**
- **Discussion: Aggregations, Dual Participation & Performance Obligations**
- **Next Steps**

Purpose of Today's Meeting

- **Review feedback received between 10/10/16 and 11/15/16**
- **Discuss Aggregations, Dual Participation and Performance Obligations**

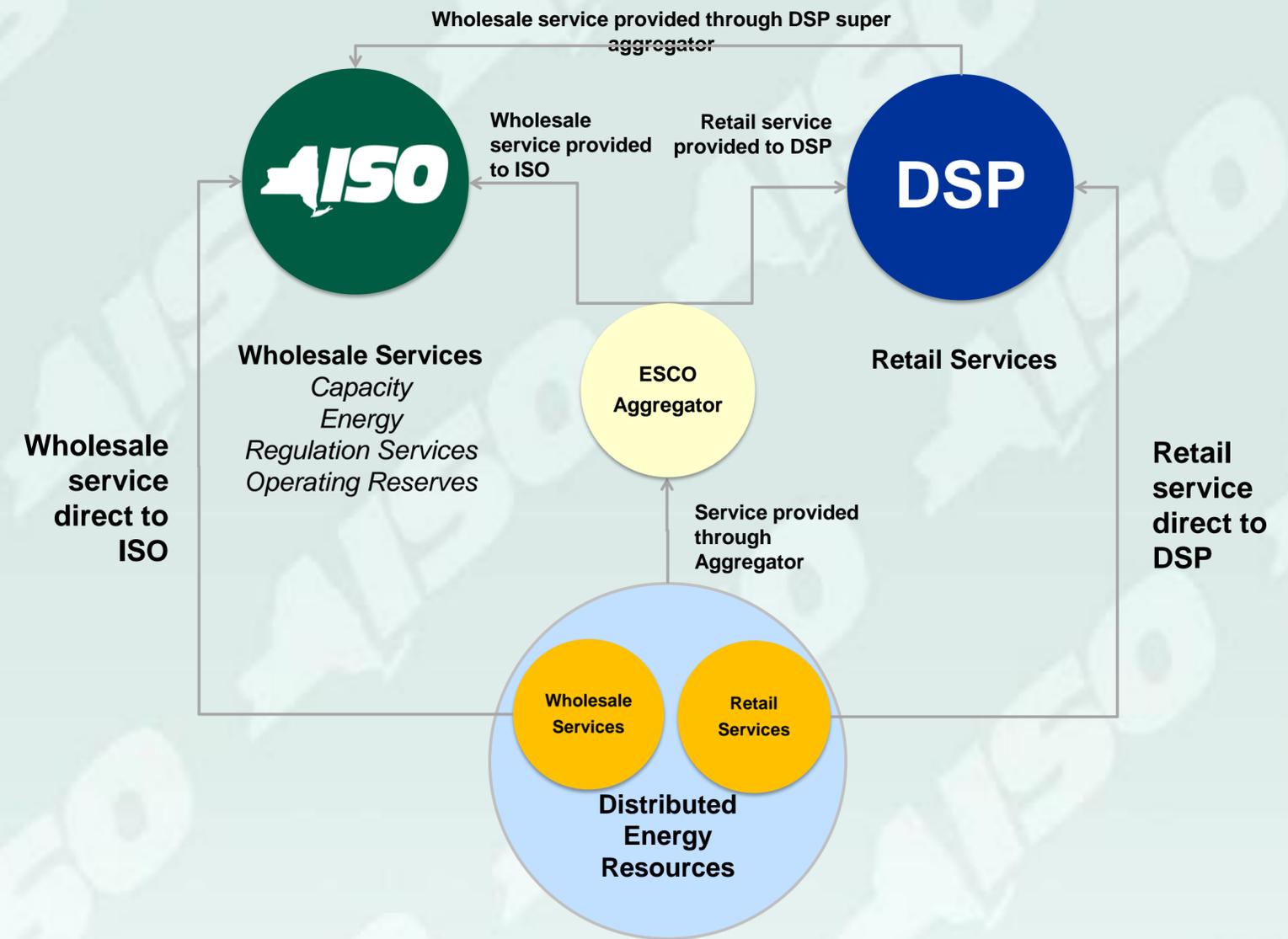
Initiative Scope

- Roadmap for next 3-5 years for integration of DER and evolution of current Demand Response programs
- DER is a resource or set of resources
 - *typically located on an end-use customer's premises and operated for the purpose of supplying customer electric load -- that seeks to provide NYISO wholesale market services*
- *Curtailable load, generation, storage, or various combinations*
- *Individual resources or aggregations*
- *Net load or net generation*

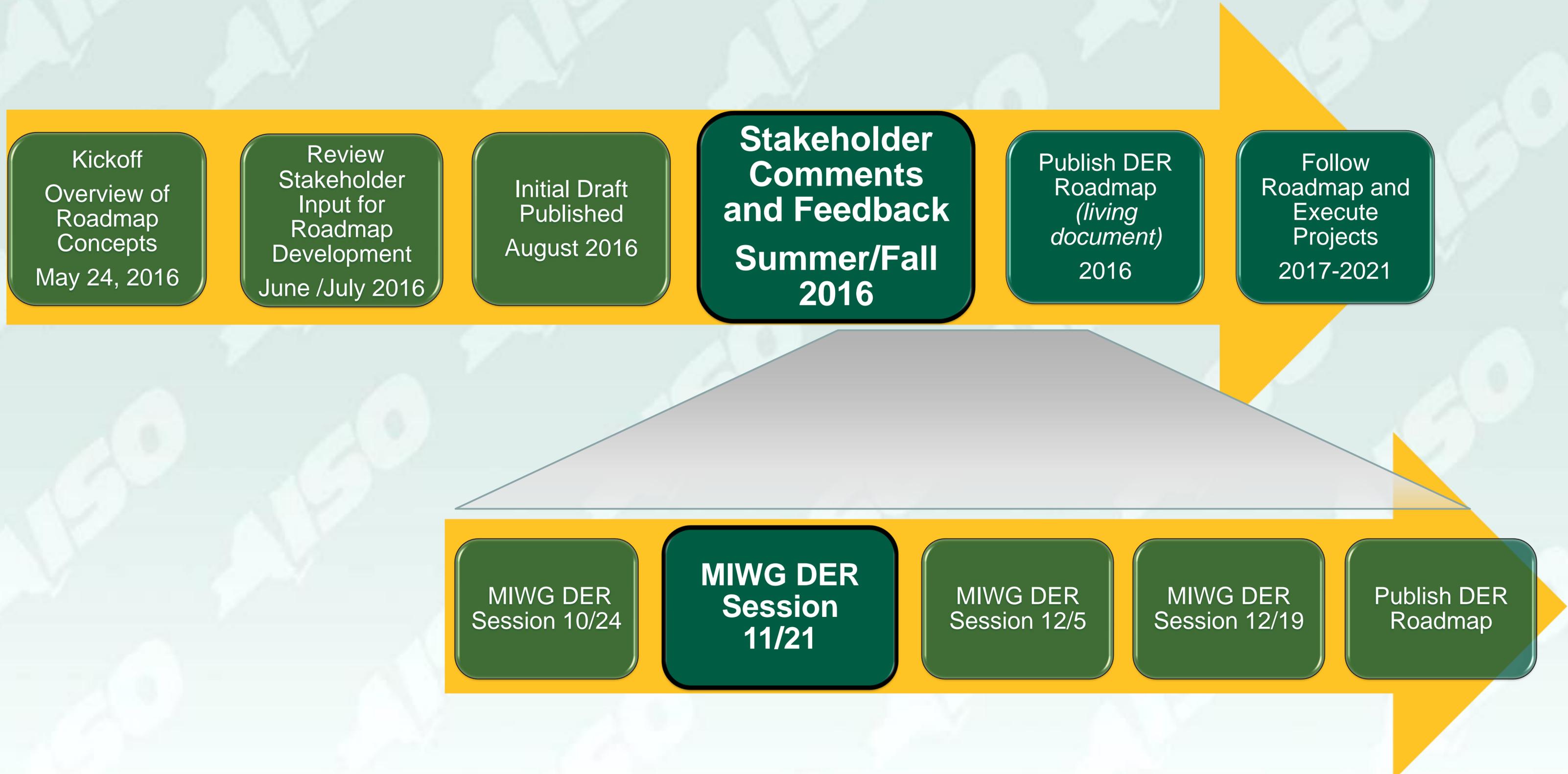


Key Objectives

- Integrate DER into energy, capacity, and ancillary services markets
 - *Ability for real-time scheduling*
 - *Minimize out-of-market actions*
- Align with goals of NYS REV
- Appropriate measurement and verification
- Align payments with performance
- Focus on wholesale market



DER Roadmap Development Process



DER Roadmap Development & Discussion

- **MIWG DER Session 10/24**
 - *Review of Feedback, Updated Schedule, Discussion: Measurement and Verification, Stakeholder presentations*
- **MIWG DER Session 11/21**
 - *Stakeholder presentations, Review of Feedback, Updated Schedule, Discussion: Aggregations, Dual Participation and Performance Obligations*
- **MIWG DER Session 12/5**
 - *Stakeholder presentations, Review of Feedback*
- **MIWG DER Session 12/19**
 - *Overview of Updates to the DER Roadmap*
- **Publish DER Roadmap**

Stakeholder Presentations

Summary of Feedback Received
Existing DR Program
10/10/2016 – 11/15/2016

Feedback Received

SCR Program

- Will NYISO consider changing SCR program rules to allow SCRs to inject into the transmission grid?
- NYISO Response:
 - *No, that is what the DER program is being designed to allow*

Feedback Received

SCR Program

- **Is NYISO changing the SCR program?**
- **NYISO Response:**
 - *Any changes to the SCR program, including eligibility, obligation, or payments, will be assessed after the development of the DER concepts. If NYISO determines future changes are warranted, NYISO will work with stakeholders to develop an appropriate transition plan from the current rules*

Summary of Feedback Received

Dispatchable DER Program

10/10/2016 – 11/15/2016

Feedback Received

Measurement & Verification

- **NYISO should:**
 - *Reduce barriers to entry – specifically in metering requirements*
 - *Consider whether the same M&V data required for large resources is necessary for smaller resources*
 - *Consider if NYISO needs individual resource data for resources in an aggregation to appropriately measure and verify performance*

Feedback Received

Mitigation

- **NYISO should consider:**
 - *Whether it needs to establish reference prices for DER, at least for DR*
 - ISO-NE and PJM have said that DER reference prices can not be set; NYISO should consider whether this is true in its markets
 - Can DER at low penetration levels manipulate prices via withholding
 - Are DER operating costs significantly more variable than that of larger resources such that reference prices cannot be accurately established
- **NYISO should clarify the purpose of the Net Benefits Test**

Feedback Received

DER

- **NYISO should:**
 - *Not require DER to use the State of Charge signals if they are offered*
 - *Better clarify DR's place in DER Roadmap*
 - *Provide more detail on dual participation*
 - *Encourage the participation of non-dispatchable DER*

Feedback Received

Aggregations

- **NYISO should:**
 - *Allow for both zonal and transmission substation-level aggregations*
 - *Carefully consider the aggregation size limits so that as many resources as possible can participate*
 - *Stick to zonal aggregations with the option for DER to choose between nodal or aggregated dispatch*

Today's Discussion Topics

**Aggregations, Dual Participation and
Performance Obligations of Dispatchable
DER**

Aggregations

Aggregations

- **Aggregations participating in existing NYISO demand response programs have been largely successful; NYISO plans to permit aggregations for Dispatchable DER as well**
- **Exploring permitting aggregations to include different technologies**
 - ***A single DER aggregation could include load reductions, generation, storage technologies, etc.***

Aggregations

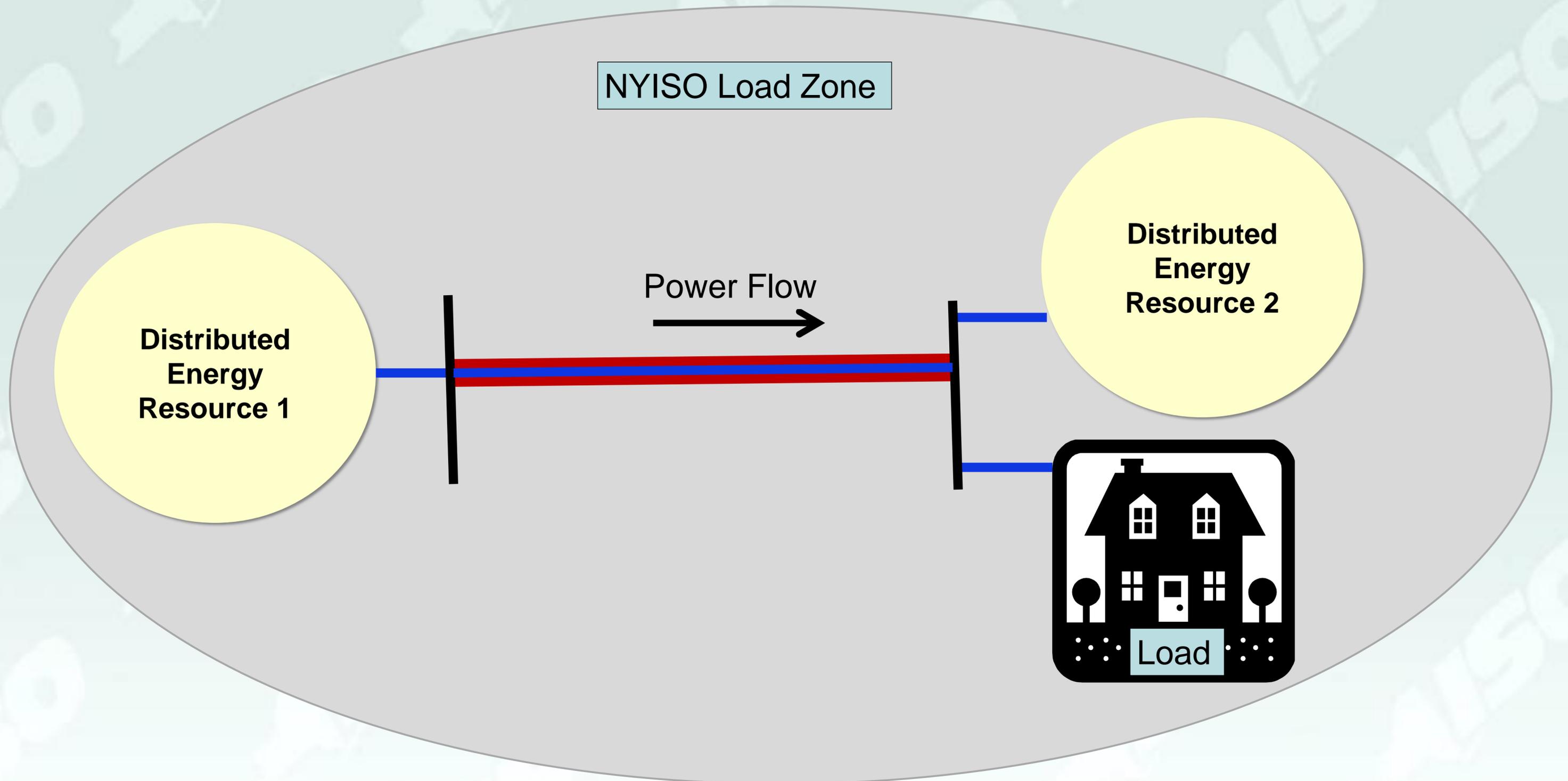
continued

- **Zonally aggregated Dispatchable DER do not provide NYISO Operators with the same flexibility and effectiveness (both reliability and market efficiency) to solve constraints as transmission substation-level aggregations**

Simplified Example of a Zonal Aggregation Dispatch

- Consider a zonal aggregation that consists of two DER on either ends of a transmission line
- The transmission line is overloaded
 - *Injections from DER 1 will aggravate the overload*
 - *Injections from DER 2 will help alleviate the line loading*

Simplified Example of a Zonal Aggregation Dispatch (cont'd)



Simplified Example of a Zonal Aggregation Dispatch (cont'd)

- **NYISO has limited ability to dispatch resources aggregated by zone to effectively manage this constraint**
 - ***If NYISO dispatches this zonal aggregation up, DER 1 will further aggravate the constraint***
 - ***If NYISO dispatches this zonal aggregation down, DER 2 will not be able to efficiently help manage the constraint***

Aggregations

Transmission Substation-Level

- **Granular aggregations provide greater system benefits**
 - *The NYISO is developing the capability to provide granular load bus pricing data to align with the REV initiative*
- **NYISO vision:**
 - *All resources in the aggregation must be interconnected to, and have direct impact on, the same transmission substation*
 - *Aggregations will use transmission substation LBMPs*
- **Further coordination will be required between NYISO and the Transmission Owners in identifying aggregation mapping**

Dual Participation

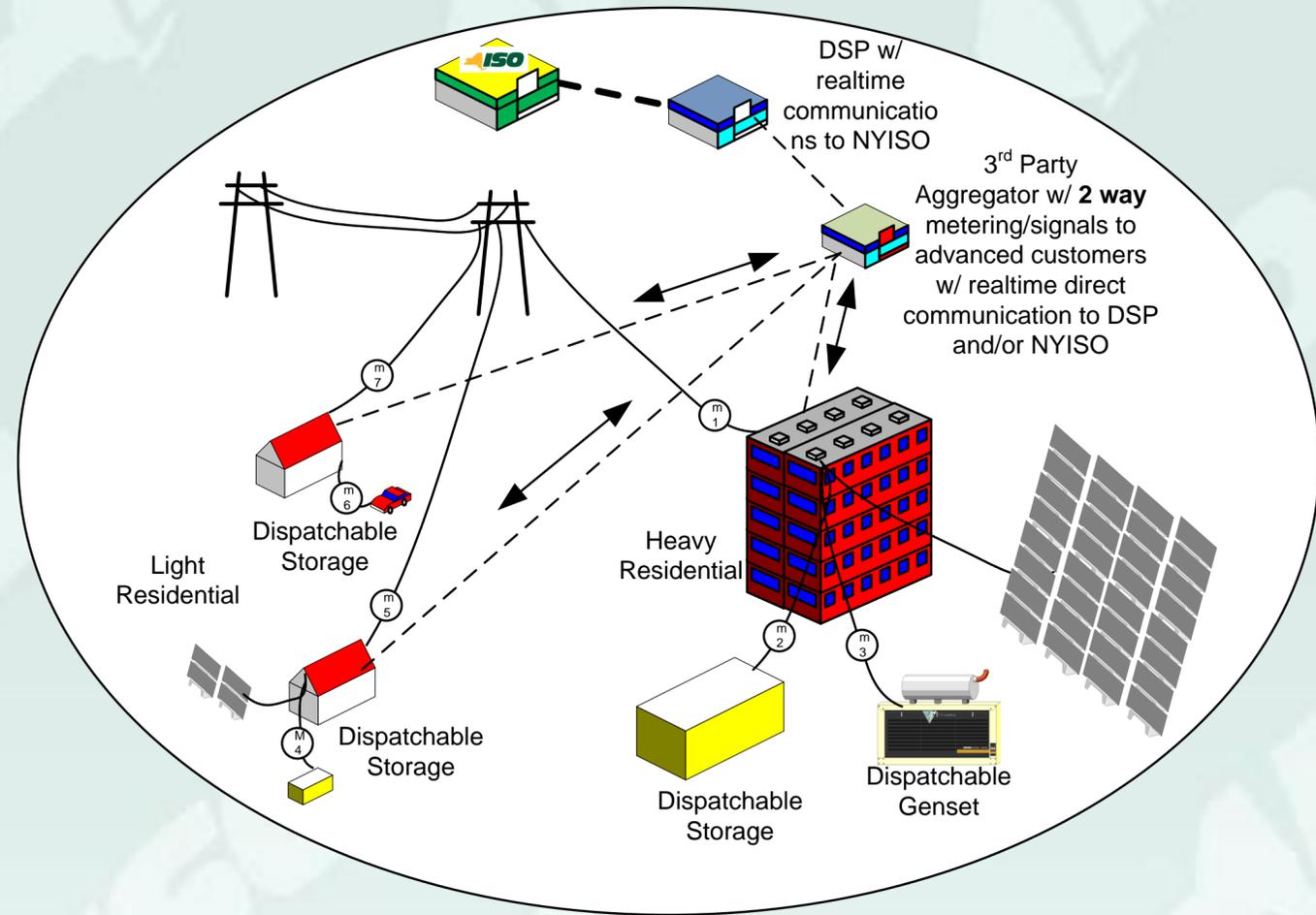
Dual Participation

- **Feedback received indicates a strong desire to allow resources to participate in both retail and wholesale markets**
- **NYISO and Transmission Owners are currently and will continue to discuss coordination and operations issues that arise when DER participate in retail and wholesale markets**

Dual Participation

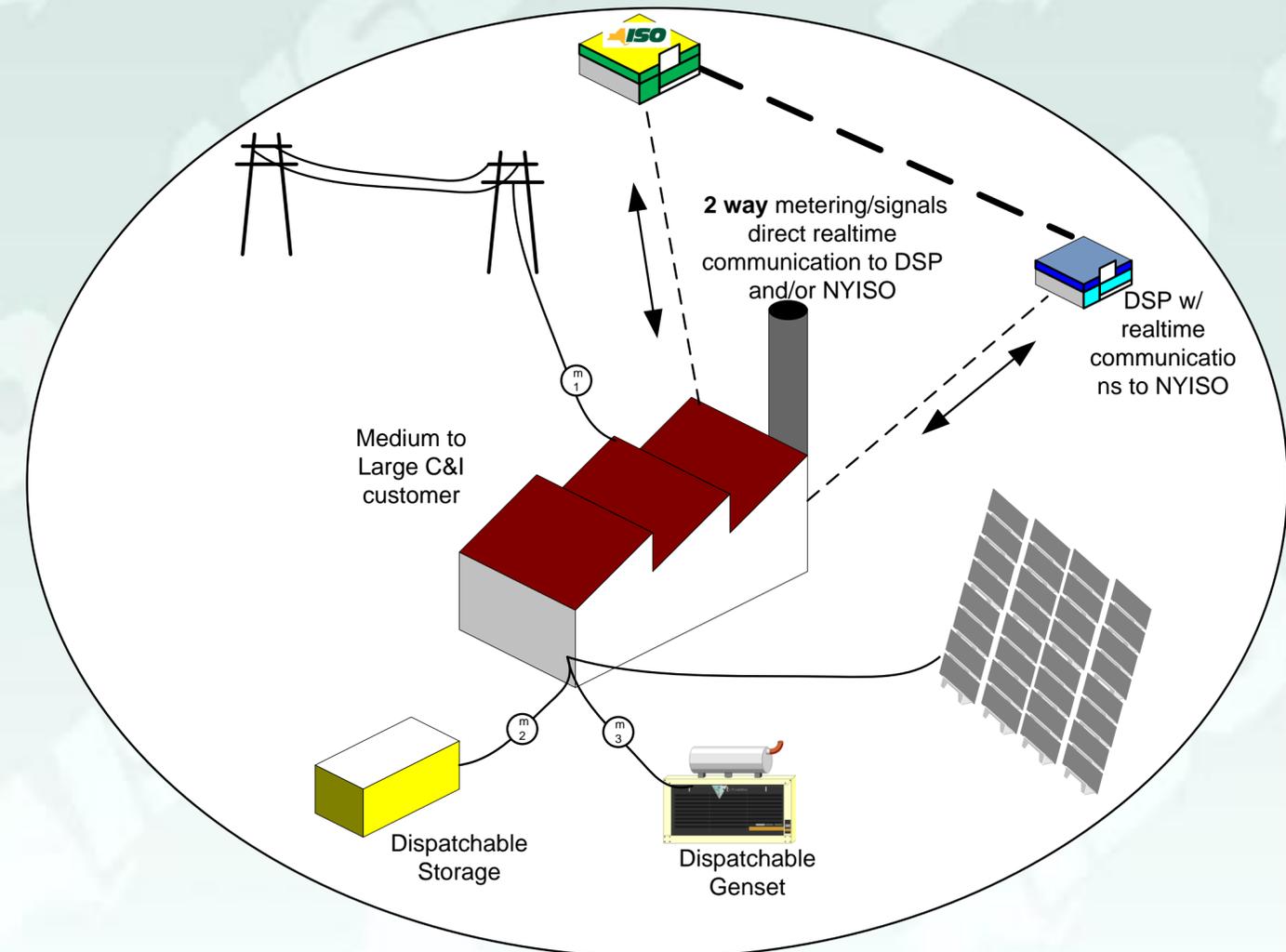
- **NYISO is exploring how to allow dual participation in wholesale and retail programs**
 - **If permitted, resources participating in wholesale and retail markets will be held accountable for all applicable NYISO obligations**
 - ***For better operational coordination, all metering/scheduling/dispatching communications will be:***
 - **Through the DSP to the NYISO or**
 - **To the DSP and the NYISO at the same time**
- See next slide for examples***

Dual Participation



Through the DSP to the NYISO

To the DSP and the NYISO at the same time



Dual Participation

- **Discussion**

- *What wholesale and retail market programs/services do resources plan to participate in?*
- *Do resources envision using full resource capability in both markets?*
- *How can the NYISO ensure resources can meet wholesale obligations when also participating in retail markets?*
- *Other considerations?*

Performance Obligations

Performance Obligations

- **DER are expected to have comparable obligations to resources**
- **Payments from NYISO are expected to be aligned with the value of the service provided to the transmission grid**
 - *The Roadmap envisions multiple service “tiers” (e.g., full day, daytime and peak time)*

Feedback Received

Performance Obligations

- **NYISO should:**
 - *Consider allowing facilities employing energy efficiency measures to sell capacity (e.g., similar to ISO-NE and PJM rules)*
 - *Consider valuing resource attributes other than output duration when determining capacity payments*
 - **What attributes will be required with 50% renewables?**

Feedback Received

Performance Obligations

- **Multiple entities highlight two major concerns:**
 - *Performance duration should not be the only criteria NYISO considers when determining a resource's value to the transmission grid; consider other beneficial attributes*
 - *Extended market design process and rule development may delay new resource development*

Feedback Received

Performance Obligations

- **NYISO should evaluate additional resource attributes that a resource may provide to the transmission grid:**
 - ***Temporal Attributes:***
 - **Temporal Flexibility – flexibility to deviate from DA schedule in RT**
 - **Cycles per day – maximum number of off/on cycles per day**
 - **Minimum Notification Time – minimum notification time required to respond to ISO instructions**

Feedback Received

Performance Obligations

- ***Temporal Attributes (cont'd):***

- **Energy Capacity Duration** – number of hours a resource can follow ISO instructions at maximum injection
- **Load Capacity Duration** – number of hours a resource can follow ISO instructions at maximum load
- **Operating Window** – operating hours available to the NYISO

- ***Dispatchability Attributes:***

- **Flexibility** – response rate of the resource in MW/min
 - *N/A (intermittent)/Hourly/15min/5min/6sec*

Feedback Received

Performance Obligations

- ***Dispatchability Attributes (cont'd):***
 - **Energy Capacity** – ability to follow ISO instructions for injecting energy
 - **Load Capacity** – ability to follow ISO instructions for consuming load
- ***Physical Attributes:***
 - **“balancing ratio”** - % of deliverable capacity to NYISO load
 - **Voltage Controls** – ability to provide voltage support
 - **Inertia Controls** – ability to provide inertial response
 - *None/Synthetic/Spinning Mass*
 - **eFORd** – eFORd or equivalent of the resource

Feedback Received

Performance Obligations

- *Environmental Attributes:*

- Rate of Carbon Emissions – tons of carbon per MW of output

- **Discussion**

- *Are there other attributes? Other concepts?*
- *Thoughts?*

Did we miss any of your feedback?

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Comments & Questions

DER_Feedback@nyiso.com

[August 2016 Draft DER Roadmap](#)

- **The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:**
 - *Maintaining and enhancing regional reliability*
 - *Operating open, fair and competitive wholesale electricity markets*
 - *Planning the power system for the future*
 - *Providing factual information to policy makers, stakeholders and investors in the power system*

- ***www.nyiso.com***