

Distributed Energy Resource (DER) Policy Evolution and Integration into the Wholesale Electricity Markets



*New England Electricity Restructuring
Roundtable (#164)*

Henry Yoshimura

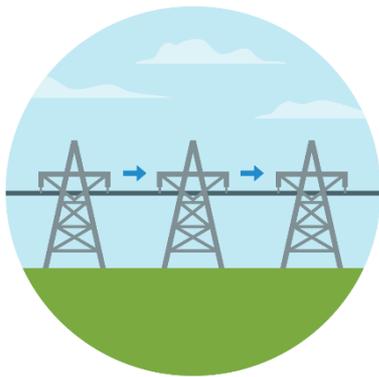
DIRECTOR, DEMAND RESOURCE STRATEGY



ISO New England Performs Three Critical Roles to Ensure Reliable Electricity at Competitive Prices

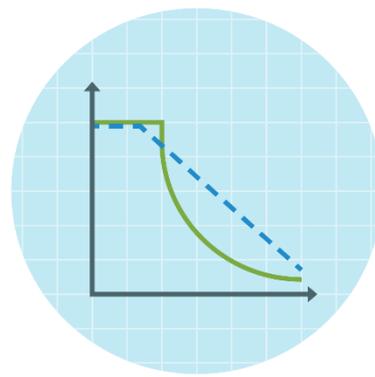
Grid Operation

Coordinate and direct the flow of electricity over the region's *high-voltage transmission system*



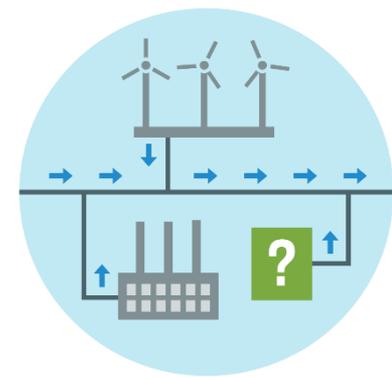
Market Administration

Design, run, and oversee the markets where *wholesale electricity is bought and sold*



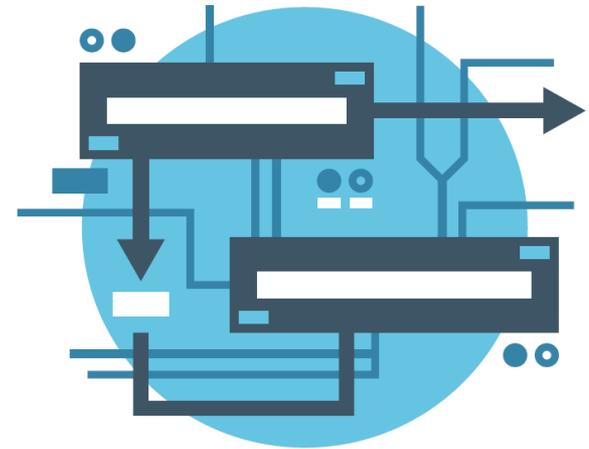
Power System Planning

Study, analyze, and plan *to make sure New England's electricity needs will be met* over the next 10 years

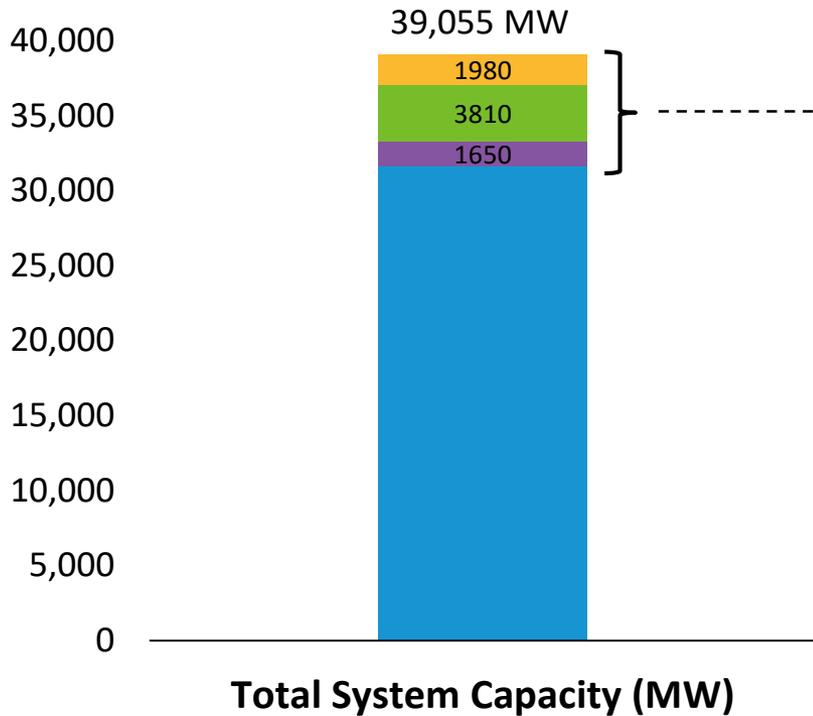


DER Proliferation Challenges Current Approaches

- Presently, most generation and some demand response are dispatched by the ISO to meet **price-inelastic demand**
- With more behind-the-meter technologies and time-varying retail rates, net demand could become **less predictable**
- In a high-DER future, power flows become **more variable, bi-directional, and less predictable**
- Real-time operations, wholesale/retail market design, and regional planning become **more complex**



DERs Comprise A Sizable Share of System Capacity



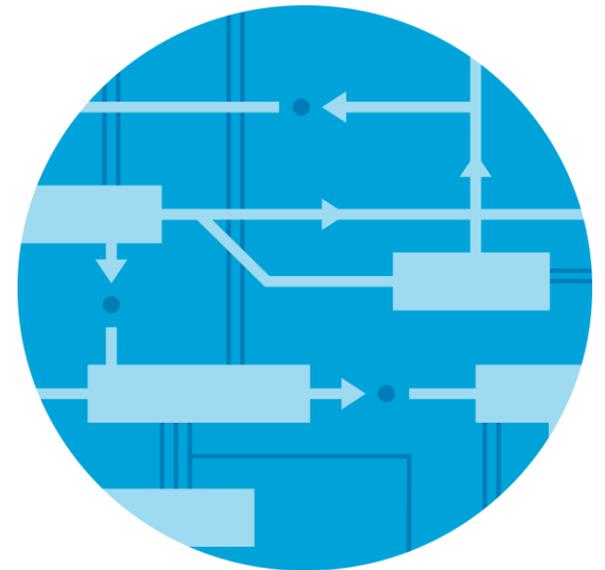
20%

The amount of total system capacity provided by various DER categories (e.g., energy efficiency, demand response, solar PV, other renewable generation, other generation and electricity storage) as of September 1, 2019

- Solar PV Outside the Wholesale Market
- DR Maximum Capacity
- Settlement-only Resources (Nameplate)
- System Operable Capacity

Distributed Energy Resource Management Is Needed in a High-DER Future

- ISOs/RTOs operate and administer markets for **all resources** connected to the **bulk power system (BPS)**
- Some DERs participating in wholesale markets are economically dispatched along with bulk power system resources, **but without regard to distribution constraints**
 - Distribution systems and service to retail customers have traditionally been regulated by the states



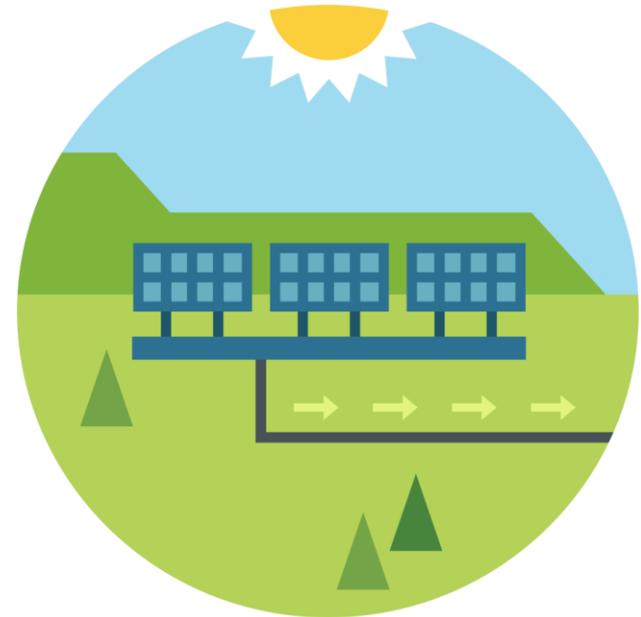
Who Should Be Charged with Managing DERs?

- As DERs proliferate, a **distribution system operator (DSO)** will be needed to **economically dispatch** them in conjunction with bulk power system resources
- Three potential DSO structures are emerging:
 - **Total ISO:** the ISO takes on the function of the DSO, and optimizes the entire power system (CAISO is going in this direction)
 - **Nested:** the ISO and DSOs each operate/optimize resources and loads within their footprint, and conduct trade by communicating to each other a single aggregated resource/load at each T-D interface
 - **Hybrid:** DERs could participate in either wholesale or retail markets; the ISO optimizes DERs in the wholesale markets, and the DSO optimizes DERs in the retail markets (NYISO is going in this direction)



How Does ISO New England Fit into this Picture?

- ISO New England **has long recognized** the role of distributed energy resources in the wholesale electricity markets
- The ISO has been **adapting, and will continue to adapt,** its market design to accommodate the transition to a growing level of DERs



Questions to be Resolved



- **Who** should create and oversee the DSO function?
- Should the DSO be a distribution-level entity overseen by the **states**, or a BPS-level entity overseen by **FERC**?
- How does a **multi-state ISO/RTO** manage a system consisting of states and distribution utilities with differing views and preferences?
- What guidance will FERC provide on **federal/state jurisdiction** over DERs to inform regional discussions of the DSO function?



Conclusion

- Early identification of the entity responsible for the DSO function will be ***critical*** ...

... both for the states to realize their ***policy objectives***, and

... for the ISO to be able to successfully ***plan and operate a system*** with high penetration of DERs



Questions

