



Key Grid Challenges Facing the New England Electric System

Restructuring Roundtable

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ISO New England Is Focused on Developing Solutions to Today's Key Grid Challenges

Integrating Markets and Public Policy

Accommodating the states' clean energy goals while maintaining competitively based capacity pricing for other resources



Addressing Fuel Security

Ensuring the region's generators have adequate fuel to produce electricity, particularly in the wintertime



States Are Supporting the Development of Clean Energy Resources to Meet Their Public Policy Goals

- Growing provision of out-of-market revenues through long-term contracts
- Legislative initiatives vary by state



State(s)	Recent State Resource Procurement Initiatives	Expected Resources	Target MW (nameplate*)
MA, CT, RI	2016 Multi-State Clean Energy RFP	Solar, wind	460
MA	2016 Energy Diversity Act	Clean energy, incl. hydro import	Approx. 1200
MA	2016 Energy Diversity Act	Off-Shore Wind	Up to 1600

*Note: Nameplate megawatts (MW) may be higher than qualified Forward Capacity Market (FCM) capacity MW



But Current Forward Capacity Market Rules Are at Odds with State Policy Goals

- The Forward Capacity Market (FCM) must ensure accurate pricing to attract and sustain needed resources
- The minimum offer price rule (MOPR):
 - Prevents resources from bidding below their competitive price
 - Exempts a limited amount of state-sponsored renewables
- As more state-sponsored renewables come on line:
 - They will exceed the MOPR exemption and be excluded from the FCM
 - New non-state-sponsored resources may clear instead



The Likely Results Are Inefficient for the Region

- The region could end up with overbuilt capacity—more power resources than needed to reliably serve load
- Consumers would effectively “double pay” to incentivize future electricity supplies:
 1. Capacity payments through the FCM
 - +
 2. Retail fees/charges to fund policy resources that remain outside the capacity market



ISO New England's Proposed Path Forward

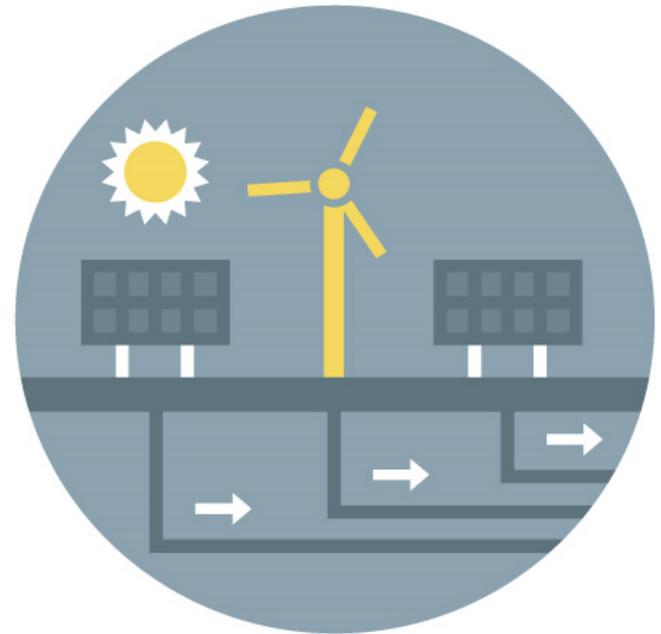
Competitive Auctions with Sponsored Policy Resources (CASPR)

- Coming out of the IMAPP process, ISO New England has offered a design approach that could be implemented in the **near term**, involving enhancements to the FCM
- The ISO's capacity market design approach:
 - **Accommodates** sponsored policy resources into the Forward Capacity Market over time, and
 - **Preserves** competitively based capacity pricing for other resources
- **Key idea:** Coordinate the entry of new state-sponsored (i.e., clean energy) resources with the exit of existing capacity resources through a new *substitution auction*



A Substitution Auction Has Many Notable Features

- The substitution auction generally does not affect payments to existing (non-retiring) resources awarded CSOs, or to load, and **preserves competitive pricing** (with the MOPR) in the *primary* auction
- It is likely to help the New England states **achieve** their GHG policy goals (as older, high-emitting units are likely to retire sooner)
- The FCA's **competitive price signals** continue to guide entry and exit when sponsored policy resources are not available



Why Is a Near-Term Solution Important?

- New England relies on the wholesale electricity markets to attract private investment, but **investor confidence** in the market structure may be weakened if action is not taken
- State procurement efforts for **clean energy** may attract resources that seek to participate in the ISO's February 2019 Forward Capacity Auction (FCA #13) with plans for commercial operation in the 2022 timeframe
- Following an extensive **stakeholder process**, the ISO plans to file tariff changes in January 2018, in time for FCA #13
- FERC approval will be needed in **early 2018** to accommodate these resources





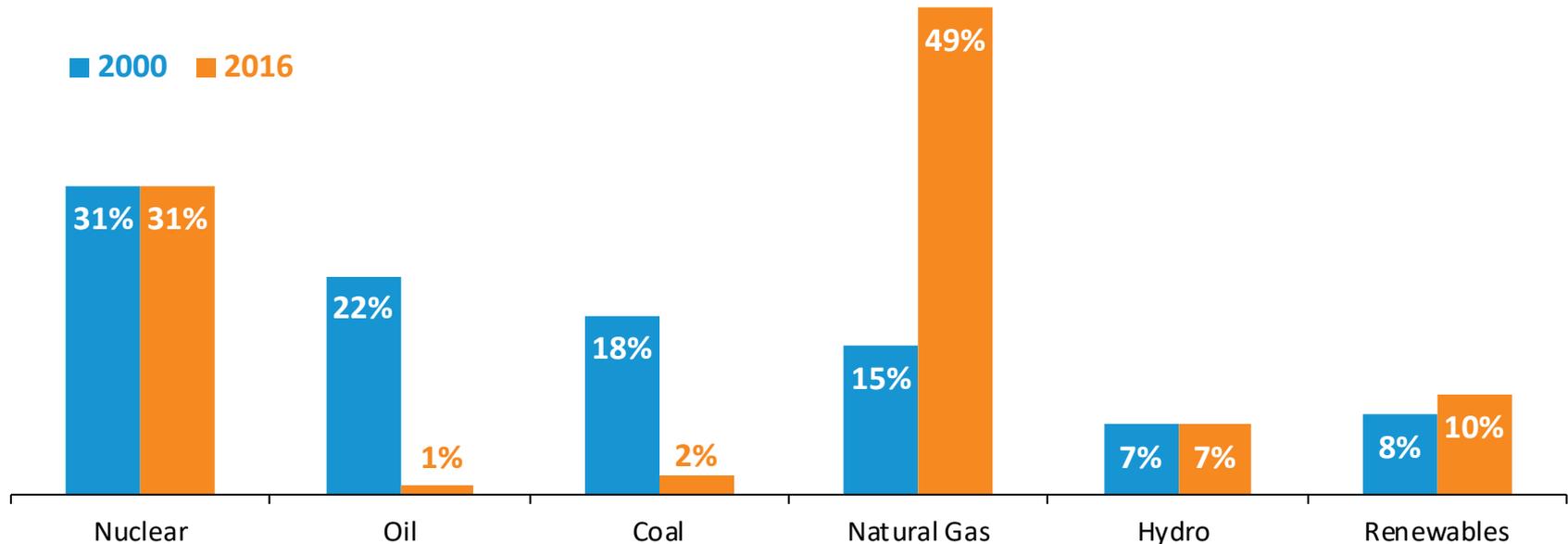
Key Grid Challenge: Fuel Security

Ensuring the region's generators have adequate fuel to produce electricity, particularly in the winter

- ISO will finalize and release its *Operational Fuel-Security Analysis* upon resolution of the U.S. Department of Energy (DOE) Notice of Proposed Rulemaking (NOPR) on Grid Resiliency Pricing

New England Has Seen Dramatic Changes in the Energy Mix: *From Coal and Oil to Natural Gas*

Percent of Total **Electric Energy** Production by Fuel Type
(2000 vs. 2016)

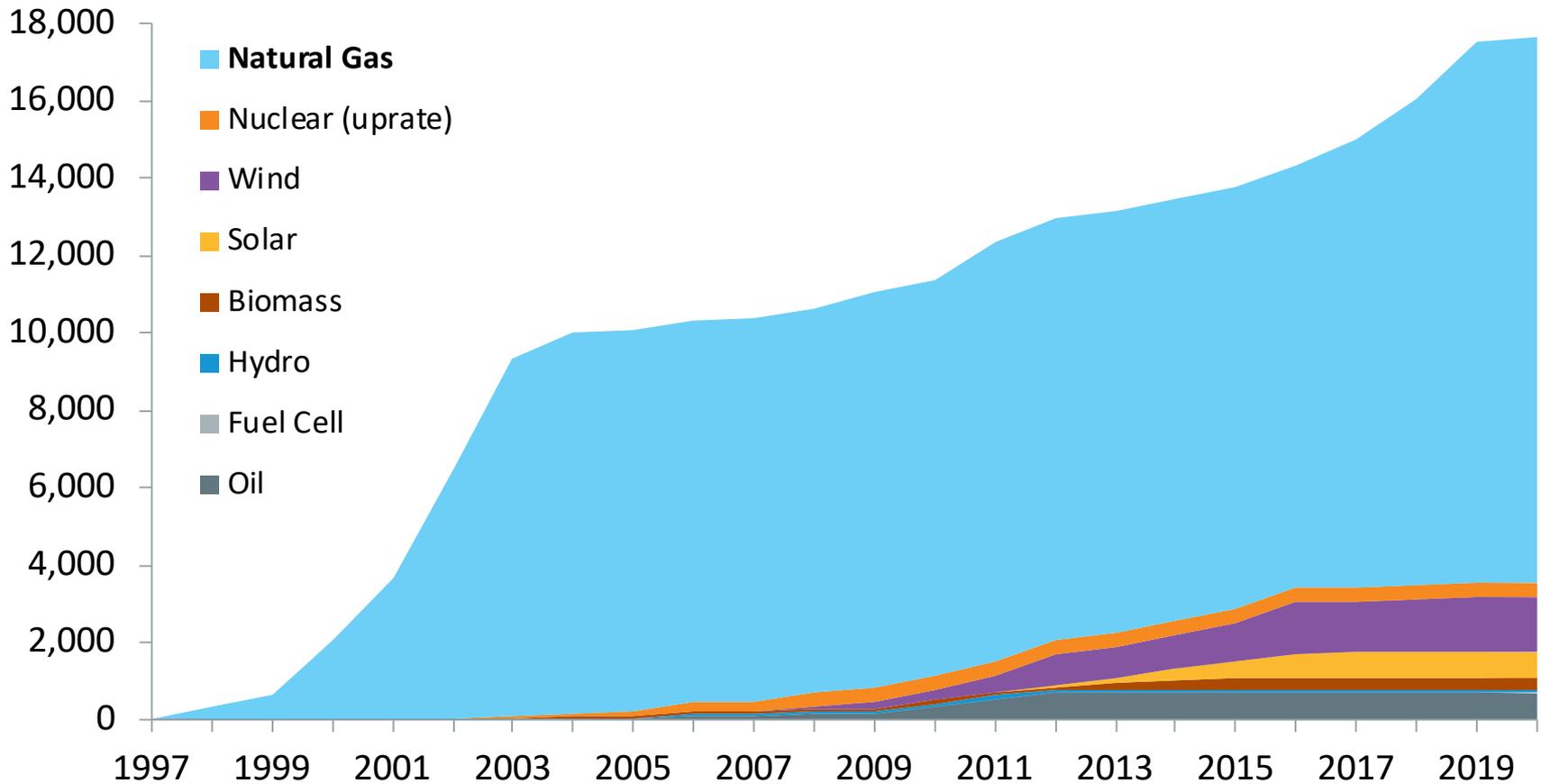


Source: ISO New England [Net Energy and Peak Load by Source](#)

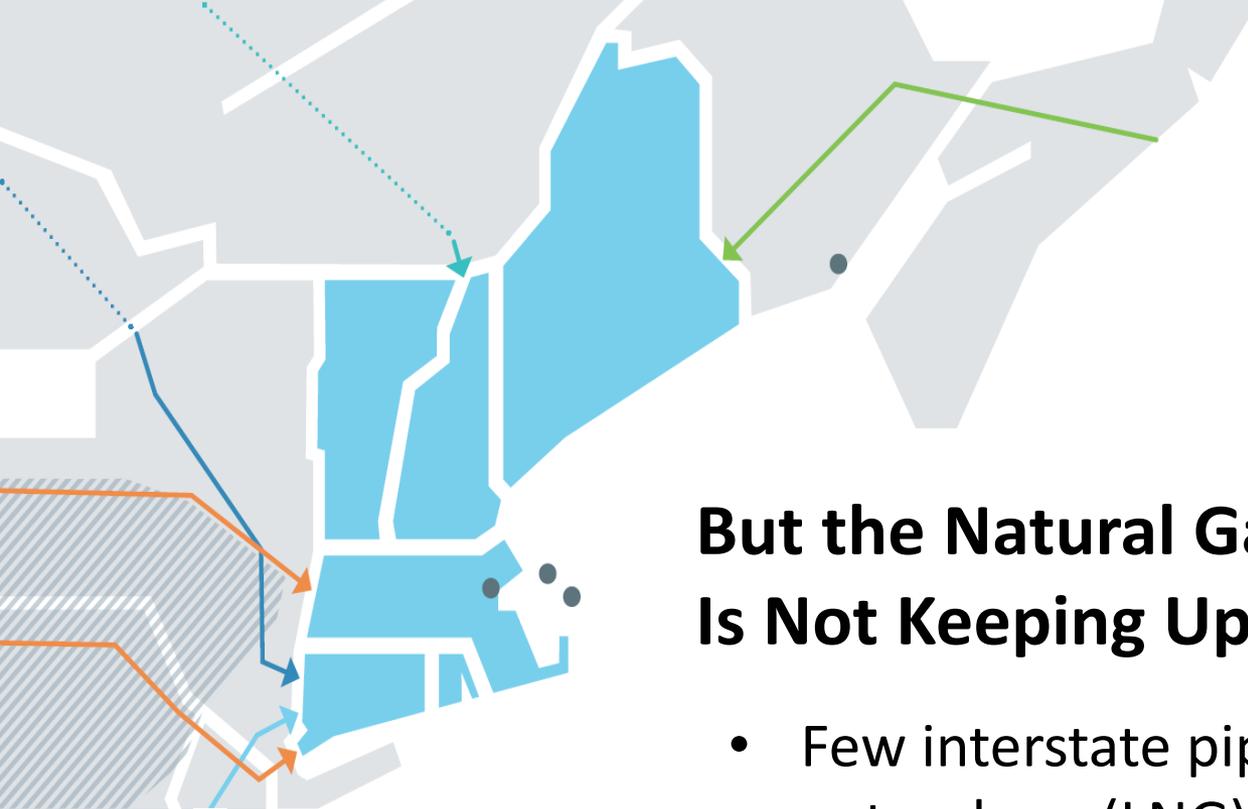
Renewables include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and miscellaneous fuels

Natural Gas Is the Dominant Fuel Source for New Generating Capacity in New England

Cumulative New Generating Capacity in New England (MW)



Note: New generating capacity for years 2017 – 2020 includes resources clearing in recent Forward Capacity Auctions.



But the Natural Gas Delivery System Is Not Keeping Up with Demand

- Few interstate pipelines and liquefied natural gas (LNG) delivery points
- Regional pipelines are:
 - Built to serve heating demand, not power generation
 - Running at or near maximum capacity during winter



Source: ISO New England

The Region Has Lost—and *Is at Risk of Losing*—Substantial Non-Gas Resources

Major Generator Retirements:

- **Salem Harbor Station (749 MW)**
 - 4 units (coal & oil)
- **Norwalk Harbor Station (342 MW)**
 - 3 units (oil)
- **Mount Tom Station (143 MW)**
 - 1 unit (coal)
- **Vermont Yankee Station (604 MW)**
 - 1 unit (nuclear)
- **Brayton Point Station (1,535 MW)**
 - 4 units (coal & oil)
- **Pilgrim Nuclear Power Station (677 MW)**
 - 1 unit (nuclear)
- **Bridgeport Harbor Station (564 MW)**
 - 2 units (coal & oil)
- *Additional retirements are looming*



LNG Is Increasingly Important, But Deliveries Can Vary

- An imported global commodity
- Must be contracted for in advance
- Arrivals of spot LNG cargoes depend on global prices and destination-flexible contracts
- Severe weather could delay ships



ISO New England Is Conducting a Study of Fuel Security Challenges



- The study is examining more than 20 cases of generating resource and fuel-mix combinations during the 2024-2025 winter, and will quantify each case's **fuel security risk**
 - *i.e.*, the number and duration of energy shortfalls that could occur and that would require implementation of emergency procedures to maintain reliability
- The study is **not** focused on the effects of expanded access to natural gas and will **not** identify needs for new or expanded pipeline capacity or natural gas infrastructure
- The preliminary results will be presented to regional stakeholders **after resolution** of the U.S. Department of Energy Notice of Proposed Rulemaking

ISO New England Submitted Comments Objecting to the DOE NOPR on Several Grounds

- The NOPR will significantly **undermine** the efficient and effective wholesale electricity markets that, with FERC’s guidance, the New England region has built over the last two decades
- The NOPR does not address New England’s **biggest challenge**, which is fuel security and availability of natural gas for power generation in the wintertime
- “Resilience” is an **amorphous concept** that is difficult to define or quantify—likely means something different to different regions
- Should additional reliability measures be needed, the region should be permitted to design **market-based solutions** through the stakeholder process that are targeted to meet New England’s specific needs

Closing Thoughts...

- State-sponsored resources are coming forward in large quantities through state procurement efforts; the ISO is seeking to accommodate them while maintaining competitively based capacity pricing for other resources
- The ISO's *Operational Fuel-Security Analysis* will help inform regional discussions on fuel security risks around the 2024-2025 timeframe

