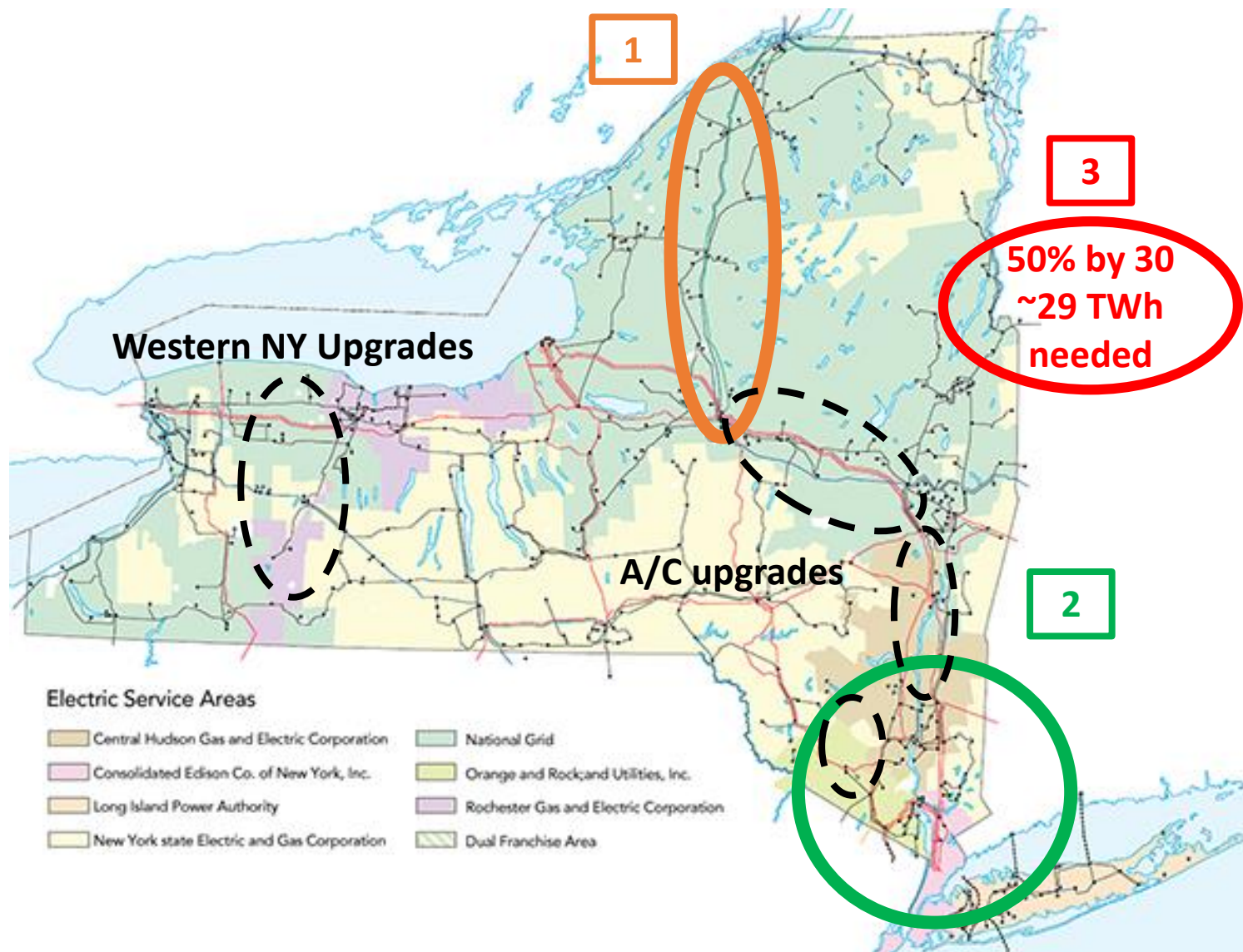




NYISO ESPWG - Request for Proposed Transmission Needs Driven by
Public Policy Requirement for the 2018-2019 Transmission Planning
Process

November 15, 2018

NYISO 2018 Public Policy Transmission Upgrade Cycle



HQ's 2018 PPT Comments

Achieve CES Objectives Most Efficiently:

1 Deliver Renewable Energy in Northern New York to Downstate Load Centers

- Facilitate upstate renewable buildout
- Leverage recent investments
- Create foundation for increased deliveries from HQ
- Unbottle NYPA's St. Lawrence Facility

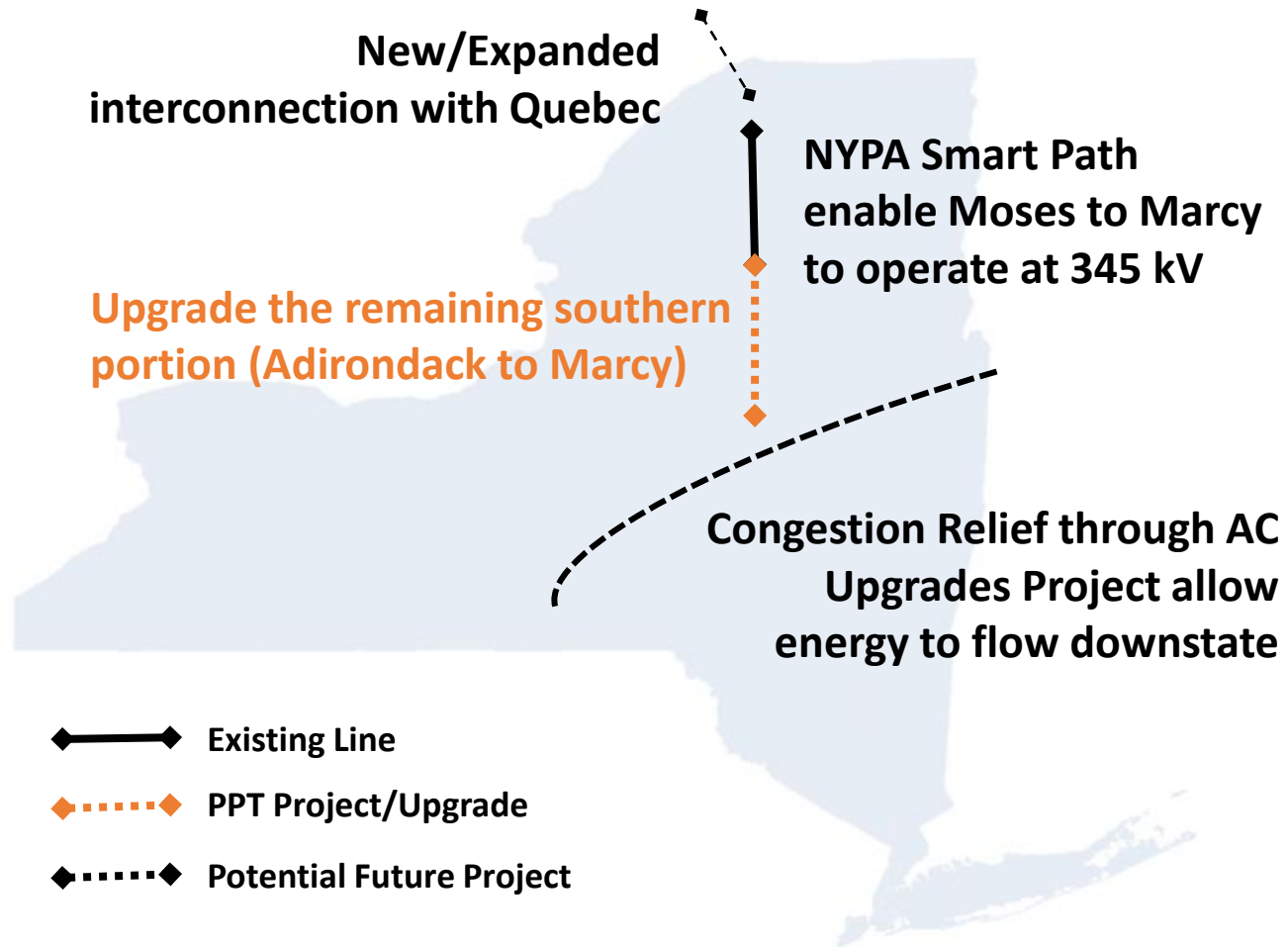
2 Clean Replacement for Indian Point

- Controllable clean supply
- Cost effective and scalable
- Available in near-term

3 Competitive Solicitation to Meet CES Goals

- Achieve goals through highest value to ratepayers
- Replicate success of Mass Clean Energy RFP

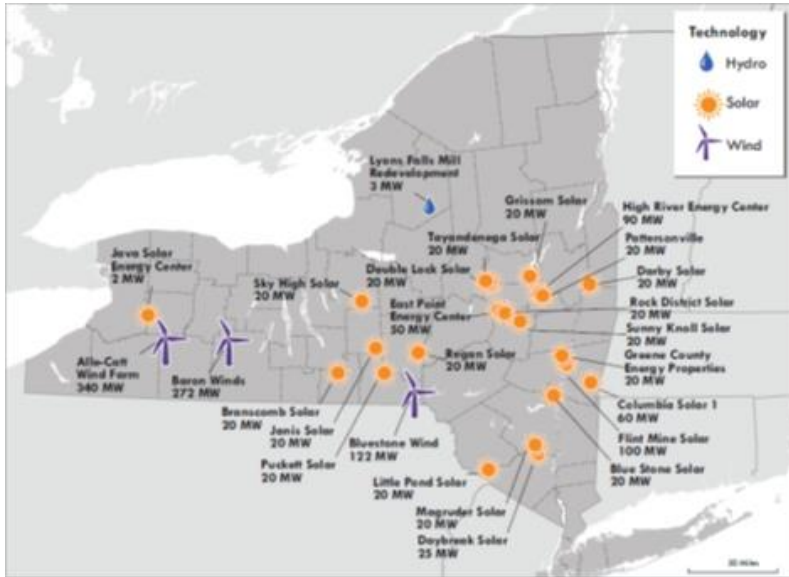
Upgrading the Moses South Corridor



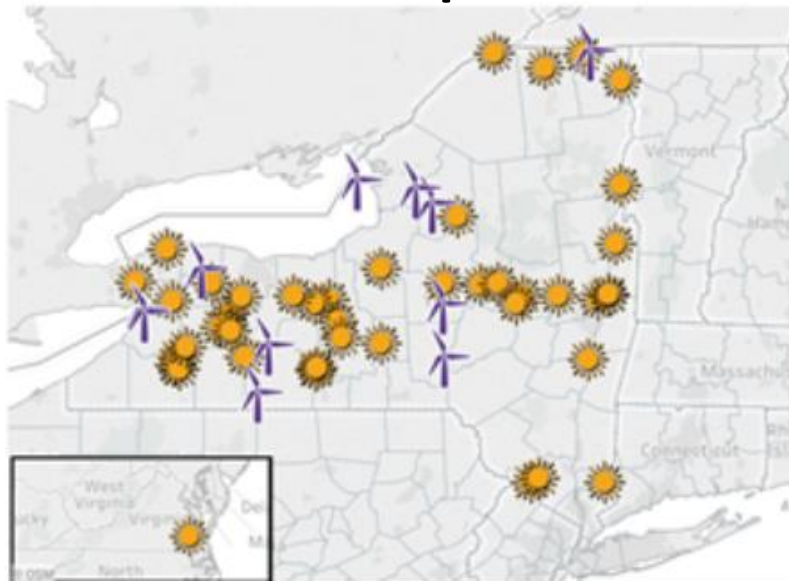
BENEFITS

- Cost effective approach to unlock additional clean energy for New York
- Leverage recent investment in NY transmission system
- Unbottle NYPA's St. Lawrence facility
- Improve economics for new/existing renewable buildout upstate
- Creates the foundation of new/expanded interconnection between HQ and New York (if combined with appropriate price signals)
- Allow HQ to deliver additional supply in hours when New York State needs it the most
- Access additional firming resources to integrate upstate renewable buildout

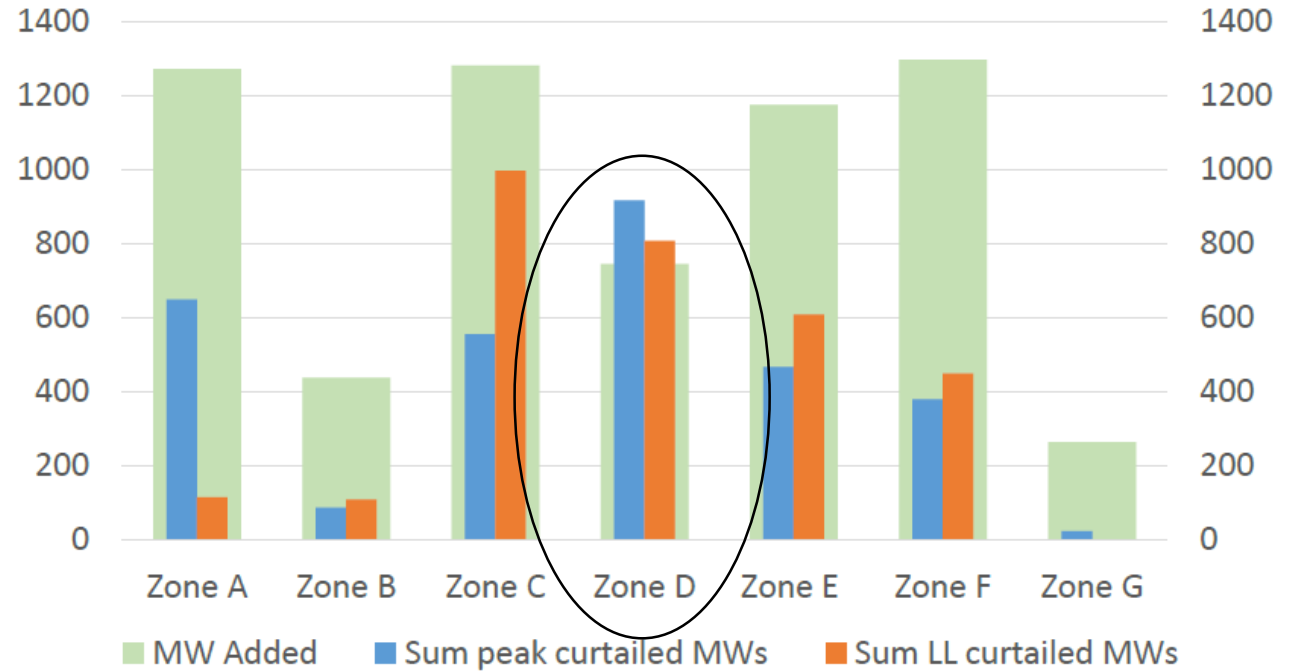
2017 Contracted



2018 Proposed



Renewables - MW added vs. MW curtailed



Majority of newly contracted and proposed renewables located in upstate and western New York

July 2018 NYISO report estimates significant renewable curtailments in the future during peak and low load events

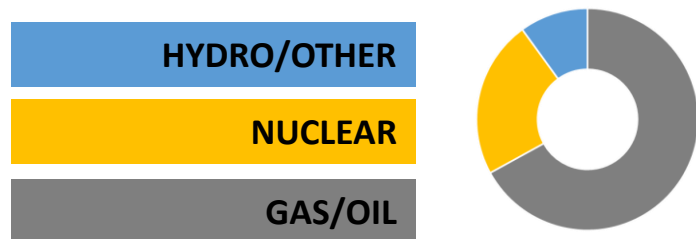
Incremental Clean Energy to Downstate Load Centers

- New HVDC between Quebec and NYC:**
- Fully incremental supply to New York City
 - Traditional and cost effective

- New HVDC between Upstate and NYC:**
- Direct access for NY resources
 - Shorter route = lower cost

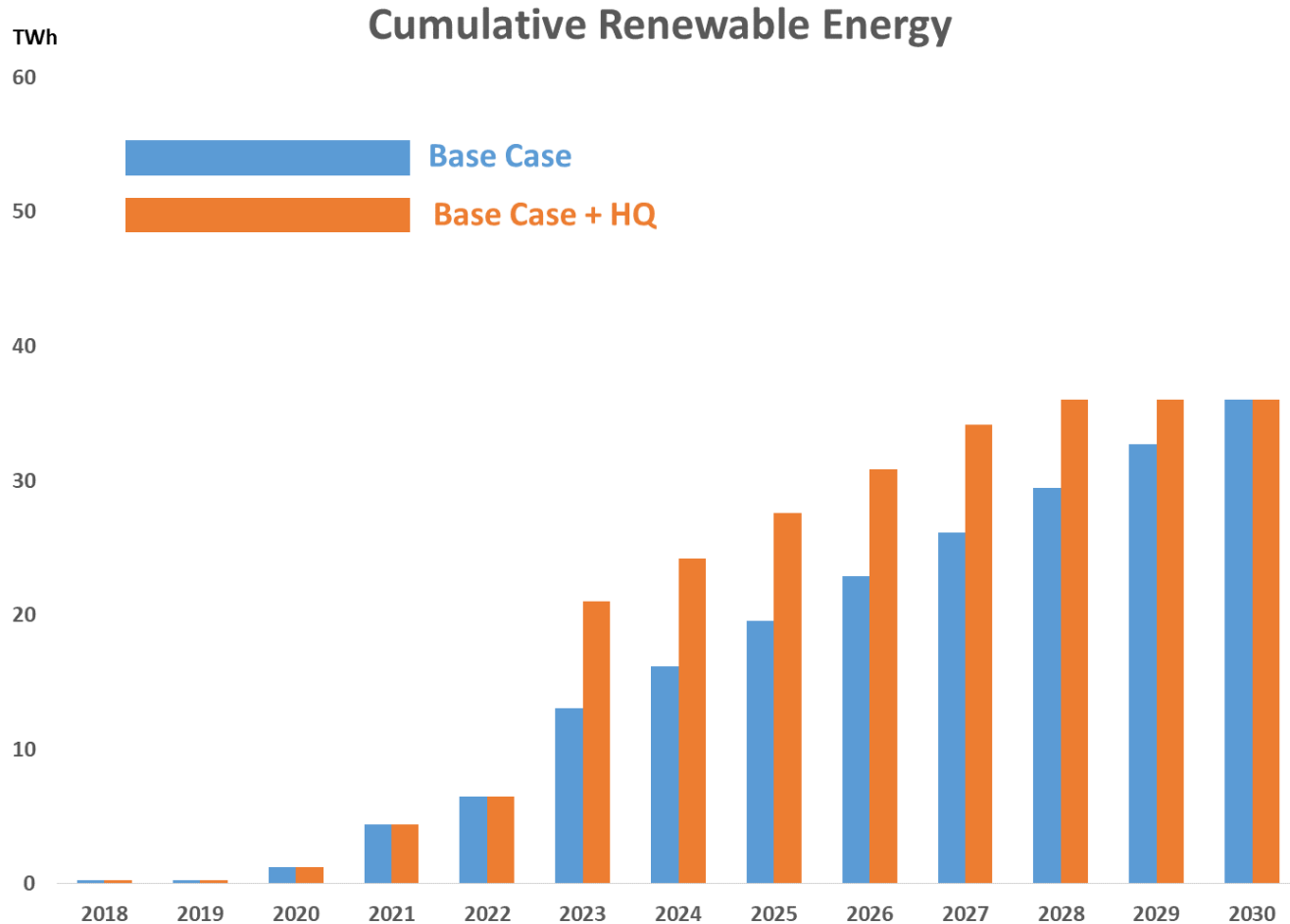
◆.....◆ PPT Project/Upgrade

DOWNSTATE FUEL MIX



- ### BENEFITS
- Clean replacement supply for downstate generation retirements
 - Cost effective and scalable solution
 - Near-term availability
 - Controllable generation which can be dispatched to integrate Offshore wind and distributed resources
 - 1,000 MW project can provide nearly 1/3rd of new renewable supply needed to meet 50% by 2030 CES objective

Value of Accelerated Action



Adding 8 TWh of annual HQ deliveries over a new 1000 MW DC line from HQ to NYC in 2023, compared to a base case which does not include this project will provide accelerated carbon reduction benefits to New York, by displacing more emitting resources sooner

**Accelerated carbon reduction benefits
NPV = \$785 Million**

Assumptions:

- Cost of carbon based on EPA's Social Cost of Carbon
- Assume HQ deliveries displace marginal emitting resources in NYC (.52 tons/MWh)
- Discount rate = 8%

Conclusion

- ❑ Recommendations intended to help NY achieve CES objectives more effectively and efficiently
- ❑ Upgrading the Moses to Marcy corridor provides numerous benefits to New York, and creates the foundation for higher imports from Quebec
- ❑ New York should consider the timing and value of near-term actions to reduce emissions

