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New York's Coordinated Grid Planning Process

November 18, 2024

Background

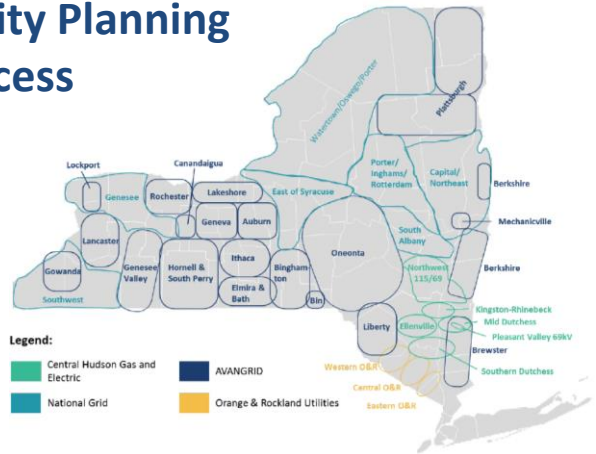
- Climate Act – 100% zero carbon electricity by 2040
- Accelerated Renewables Act
  - directs PSC and the JU to identify bulk, local transmission, and distribution system upgrades needed to meet CLCPA
  - requires JU to have plans in place for these investments
- New requirement to plan for the 20-year time horizon
- May 2020 order directed JU to propose changes to existing planning processes that would identify necessary upgrades for the long term
- 20-E-0197

Bulk versus local transmission upgrades

Bulk Planning Process

- Congestion between 11 New York Control Area Load Zones = Bulk Need
- Solutions identified w/competitive solicitation

Utility Planning Process



- 37 Local Transmission Areas Upstate in PGS
- Solutions that move renewables onto or from bulk system

CGPP should identify optimal mix of local & bulk T&D upgrades, including advanced tech.

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Key Elements of the Process

- Energy Policy Planning Advisory Council (EPPAC) – stakeholder advisory group
- Repeating study on a 3-year cycle
- Several stages of work
  - Stage 1 – collect data, develop **capacity expansion model**, select three scenarios for analysis, produce initial capacity expansion results
  - Stage 2 – build power flow and short circuit models
  - Stage 3 – local area studies and solutions development
  - Stage 4 – scrutinize solutions to identify interactions and conflicts
  - Stage 5 – least cost assessment, with limits and local transmission upgrades added to the capacity expansion model
  - Stage 6 – least cost plan report, including recommendations for cost effective investment

Capacity Expansion Modeling Overview

- Most important part of the process
  - Determines the resource mix and likely grid needs for the rest of the planning process
- Philosophy: Realism
  - More constraints vs. less, minimize post-processing
- Utilizing PLEXOS, run by NYISO

Capacity Expansion Model Inputs

- Load Forecast – *NYSERDA*, VERY important
- Existing generation mix - *NYISO*
  - Type, costs, age, operational parameters, etc.
- New Generator Information - *NYSERDA*
  - type, capital cost, fixed and variable cost, availability, timelines, operational parameters, etc.
- DER and load flexibility forecast - *NYSERDA*
- System representation – *NYISO/JU*
  - Headroom, transmission limits, external territories

Unique Inputs

- Renewable resource Supply Curve and build limits/rate
  - Location, cost, MWs of LBW, PV, OSW
- Headroom
  - Intra-zone MW availability
  - $/kW cost to increase (15% multiplier per GW)
- Hydrogen production
  - Both in load forecast and optimized for power use
- Flexible Loads
  - ~3 GW of loads assumed to be shiftable by up to 12 hours (mostly managed charging)

Capacity Expansion Outputs

- Optimized:
  - Mix of generation resources by zone
  - Operation of storage, flexible resources, and electrolysis
  - Additional headroom requirements
- Requiring Iteration:
  - DER mix, quantity, location
  - Bulk interface increases

Modeling Wish List

- Bulk transfer limit optimization
  - Currently need sensitivities to test relaxation of interfaces, may be other capabilities to unlock in PLEXOS
- Co-optimization of distribution resources
  - DERs are input, not candidate resources (though some nuance here since model doesn't know local T from D and utilities have leeway in their siting methodology)
  - Would require a lot more data and orders of magnitude more computing resources
- Full chronology, in as many hours as possible
  - "Representative days" limits storage value/accuracy and LDES
  - Must choose starting SoC, and no inter-day optimization, may be other capabilities to unlock in PLEXOS

Please reach out with questions!

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