New York ISO
Independent System Operator

Grid in Transition: Phase 1 Plan and Assumptions

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Agenda

- Background, 2022 study deliverable & plan
- Phase 1 Assumptions
- Next Steps

Today's Goal: Communicate the study plan and assumptions for Phase 1 and get stakeholder feedback.

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Background, 2022 study deliverable & plan

Grid in Transition

- **Background:**
  - A rapid transition is underway in New York State from a power grid where energy is largely produced by central-station fossil fuel generation, towards a grid with increased intermittent renewable resources and distributed generation.
  - A grid characterized by high levels of intermittent renewable resources and distributed generation will require new thinking. We approach potential market enhancement efforts with two guiding principles:
    - (1) all aspects of grid reliability must be maintained; and
    - (2) competitive markets should continue to maximize economic efficiency and minimize the cost of maintaining reliability while supporting the achievement of New York's climate policy codified in the CLCPA.
  - The study will inform the NYISO's planning, forecasting, and operations, as well as the development of wholesale market mechanisms to enhance grid resilience.

Excerpted from the August 27 2021 presentation of *2022 Market Project Candidates*
https://www.nyiso.com/documents/20142/24145498/02%20Proposed%202022%20Market%20Project%20Descriptionsl.pdf/1950d339-57d7-7e0d-dcc2-4ac1e6a738bc

Grid in Transition

- **Deliverable: Q4 Study Complete**
- **Project Description:**
  - Using the work completed to date across various NYISO studies and initiatives, including the Reliability and Market Considerations for a Grid in Transition work and Climate Change Study work, the 2022 effort will identify and, if possible, quantify through a 2022 study, the potential level of system flexibility and/or grid attributes needed to reliably maintain system balance.

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Plan

- The study will look at the evolution of the variability that dispatchable generators will face over time to inform the market design decisions we face: are changes to existing market products needed and/or are new products needed for the reliable operation of the grid?
- The study will
  - Look at evolution of load and net load shapes (load net of wind and solar) over time
  - Look at the distribution of hourly ramps over time
  - Look at periods (multi day) with low wind and solar and what that implies for net energy and hourly ramps
- Since load forecasts are constantly evolving and being reviewed and since different load forecasts have different implications, the study will be able to leverage different forecasts and their underlying assumptions by leveraging the data from different studies

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Multi phase study

- First phase – leverage the Climate Change Phase 1 "CLCPA Case" data to look at the questions
- Second phase – coordinate with 2022 planning studies
  - Leverage the upcoming Outlook study Policy Case and possibly the NYSERDA Integration Analysis: Scenario 2 load forecast case
  - Possibly leverage the RNA in a similar way
- See February 24 ICAP/MIWG presentation for additional details

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Previous Presentation

- March 3 2022 ICAP/MIWG Grid in Transition: Kickoff for 2022 Study

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Phase 1 Assumptions

Climate Change Phase 1 "CLCPA Case"

- **As discussed in the prior presentation, this phase of the study will be based on the Climate Change Phase 1 CLCPA Case data. See the Climate Change Phase 1 report for a detailed discussion of assumptions and methodology.**
  - Brief overview of the assumptions*:
    1. The CLCPA Case builds on energy policy case and accelerated climate change case.
    2. Directs 70% electricity production from renewable energy sources by 2030 and 100% electricity production from carbon-free sources by 2040.
    3. Achieves 85% reduction in greenhouse gases (GHG) by 2050 in residential, commercial, industrial and transportation sectors from 1990 GHG emission levels.
    4. Replaces fossil-based technologies with electric technologies
       a) End uses include space heat, water heat, clothes dryers and cooking in residential & commercial sectors. Industrial sector sees modest improvements in energy intensity.
       b) Residential electric space heat technology is primarily air source heat pump, with resistance heating for supplemental and secondary heating needs.
    a) 85% reduction in transportation greenhouse gases via transition to electric vehicles.

*For an overview of the assumptions see the Climate Study Assumptions – Phase 1 from the October 25, 2019 Fall Economic Conference

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Possible Adjustments

- **There are two areas in which we are proposing to modify the Climate Change Phase 1 CLCPA forecast to develop the net load forecast (net of all solar and wind):**
  - Adjustments to solar assumptions to capture the grid scale solar resources in addition to the BTM Solar PV resources already accounted for in the Climate Change Phase 1 CLCPA case.
    - Will use the same solar shape as the BTM Solar but will scale the MW up to account for the expected grid scale resources (currently 31.5 MW in zone K and 20 MW in zone F)
      - We are considering how to adjust for solar resources listed in the Gold Book Table IV-1: Proposed Generator Additions & CRIS Requests.
  - Adjustments for intermittent wind resources
    - Considering several approaches –
      - Basing wind production on actual wind output from prior years, adjusted for expected installed MW
        - » Are there years that we should use or avoid?
        - » Should off-shore wind also be based on the same land-based wind output? or should it be based on the NREL wind data?
  - We are seeking stakeholder feedback on these proposed approaches.

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Next Steps

Planned Next Step

- May 3 – present Climate Change Phase 1 analysis for feedback

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Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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Questions?