

2017 CARIS 1 Follow-Up

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Agenda

- **Schedule**
- **Model Development/Key Basecase Assumptions**
- **Preliminary Assumptions Matrix**
- **Fuel Price Forecast Methodology**
- **Final Benchmarking Results**
- **Scenarios – For Discussion**
- **Additional Metrics – For Discussion**

Updated Schedule

■ August 2017

- Present Final Benchmark Analysis
- Present Final Base Case Assumptions and Assumptions Matrix
- Present Final Fuel Price Methodology and Forecasts
- Initial Discussion of Additional Metrics and Scenarios

Target Schedule

■ September 2017

- Present Historic and Forecasted Congestion Analysis
- Present Final Emissions Allowance Price Forecasts
- Review and Finalize Three Study Cases
- Review and Finalize Generic Solutions
- Review and Finalize Generic Cost Data

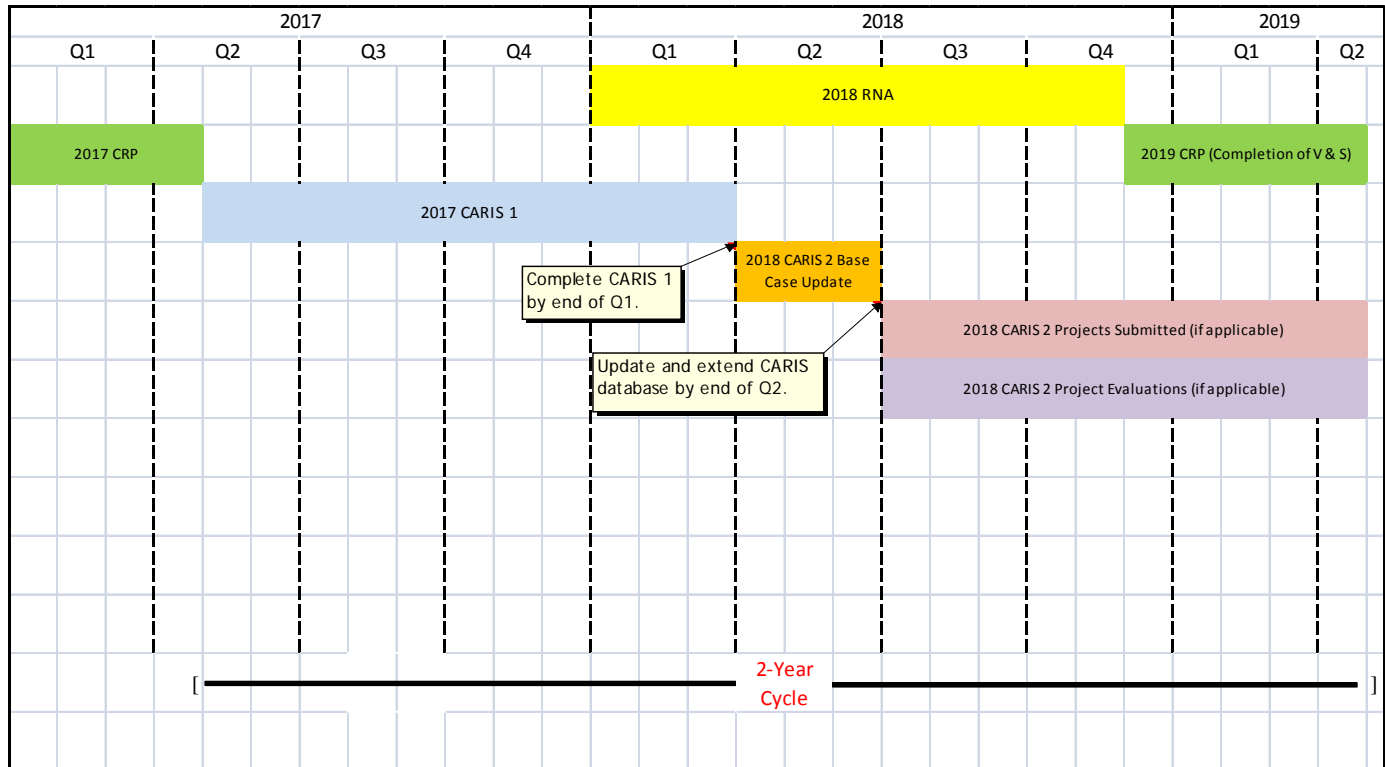
Target Schedule

- **October-November 2017**
 - Review Primary Metric Results
 - Review Additional Metric Results
 - Review Scenario Analysis Results
- **December 2017-January 2018**
 - Review Draft and Final CARIS 1 Report

Target Schedule

- **February 2018**
 - BIC and MC Presentations/Approvals
- **March 2018**
 - Submit to NYISO Board for Approval
- **April 2018**
 - Public Information Session

2017/19 CARIS Schedule



Model Development

- **Based upon 2016 Comprehensive Reliability Plan (CRP)**
 - Reliable system through-out study period
 - No Market-Based or Regulated-Backstop solutions required
 - No Generic Capacity Additions Required
 - Study period 2017-2026
- **August 15th Lock-Down for Base Case**

Generation Model Updates from 2016 CARIS 2

- Fitzpatrick In-Service
- Ginna In-Service
- Cayuga 1 & 2 In-Service
- Greenidge #4 In-Service
- Jericho Rise In-Service
- Adjusted in-service dates for Taylor Biomass (4/18), CPV Valley (2/18) and Copenhagen Wind (5/18) based on 2017 Gold Book
- Auburn LFGE and Freeport GT1 deactivated
 - Note that Shoreham GT3 and GT4 rescinded deactivation notice on August 8th

Generation Model Updates from 2016 CARIS 2

- Bethlehem Energy Center Uprate
- Cassadaga Wind
- Arkwright Summit
- Eight Point Wind Energy Center
- Cricket Valley Energy Center II
- Shoreham Solar
- Bayonne Energy Center II
- Ogdensburg

Transmission Model Updates from CARIS 2

- 3rd Oakdale 345/115 kV transformer and reconfiguration of Oakdale 345 kV station (2021)
- Seasonal by-pass of Marcy South Series Compensation (MSSC)
- Conforming PJM/NYISO modeling to current JOA
- Terminal upgrade on Stolle-Gardenville 66 line
- Clay-Pannell 345 lines PC1 and PC2 terminal upgrades (2019)

Modeling Current PJM/NYISO JOA

- Western tie to carry 32% of PJM-NYISO AC Interchange plus 20% of RECO load
- 5018 line to carry 32% of PJM-NYISO AC Interchange plus 80% of RECO load
- PAR ABC to carry 21% of PJM-NYISO AC Interchange plus 400MW OBF (operational base flow)
 - OBF reduced to 0 on May 31, 2021
- PAR JK to carry 15% of PJM-NYISO AC Interchange minus 400 MW OBF

Scenarios

- **Attachment Y, Section 31.3.1.5, reads as follows:**
 - The ISO, in consultation with the ESPWG, shall develop congestion and resource integration scenarios addressing the Study Period. Variables for consideration in the development of these congestion and resource integration scenarios include but are not limited to: load forecast uncertainty, fuel price uncertainty, new resources, retirements, emission data, the cost of allowances and potential requirements imposed by proposed environmental and energy efficiency mandates, as well as overall ISO resource requirements. The ISO shall report the results of these scenario analyses in the CARIS.

2015 CARIS 1 Scenarios

Scenario	Description
High Load Forecast	Higher growth rate
Low Load Forecast	Lower growth rate
Athens SPS Out of Service	2015-2024 (June)
High Solar Penetration	4,500 MWs of Solar-PV (distributed state-wide) by 2024; NY-SUN*1.5
Higher Natural Gas Prices	Derived from 2015 EIA AEO High Forecast
Lower Natural Gas Prices	Derived from 2015 EIA AEO Low Forecast
Higher CO ₂ Emissions Cost	Increased growth rate for CO ₂ Allowance Costs (high range of forecasted values)
Double Natural Gas Prices Differential	Midstate & New England / Upstate differential doubled
Half Natural Gas Prices Differential	Midstate & New England / Upstate differential halved

Proposed 2017 CARIS 1 Scenarios

Scenario	Description
Public Policy Transmission	Western NY PPTPN (recommended project) and AC Transmission PPTPN (generic segments A and B)
Indian Point Retirement	Retirement of IP 2 and 3 units
High Renewable Penetration	Growth in Solar and Wind (on-shore/off-shore) by 2026 consistent with track to “50 by 30” by 2030

Production Cost Analyses would be performed for 2026.

Proposed 2017 CARIS 1 Scenarios

Scenario	Description
High Load Forecast	Higher growth rate
Low Load Forecast	Lower growth rate
Higher Natural Gas Prices	Derived from 2017 EIA AEO High Forecast
Lower Natural Gas Prices	Derived from 2017 EIA AEO Low Forecast
National CO2 Program	Broader application of RGGI price

Production Cost Analyses would be performed for 2026.

2017 CARIS 1 Metrics

- NYISO Tariff defines primary and additional metrics to be estimated and reported
 - Attachment Y, Section 31.3.1.3.5
- The primary metric is the change in system production cost.
- Additional metrics include include estimates of reductions in losses, LBMP load costs, generator payments, ICAP costs, Ancillary Services costs, emission costs, and TCC payments.

Feedback on Scenarios

- Do the proposed Scenarios add value ?
- Are there alternative Scenarios that are more relevant?

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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