2017 CARIS Phase 1 Report

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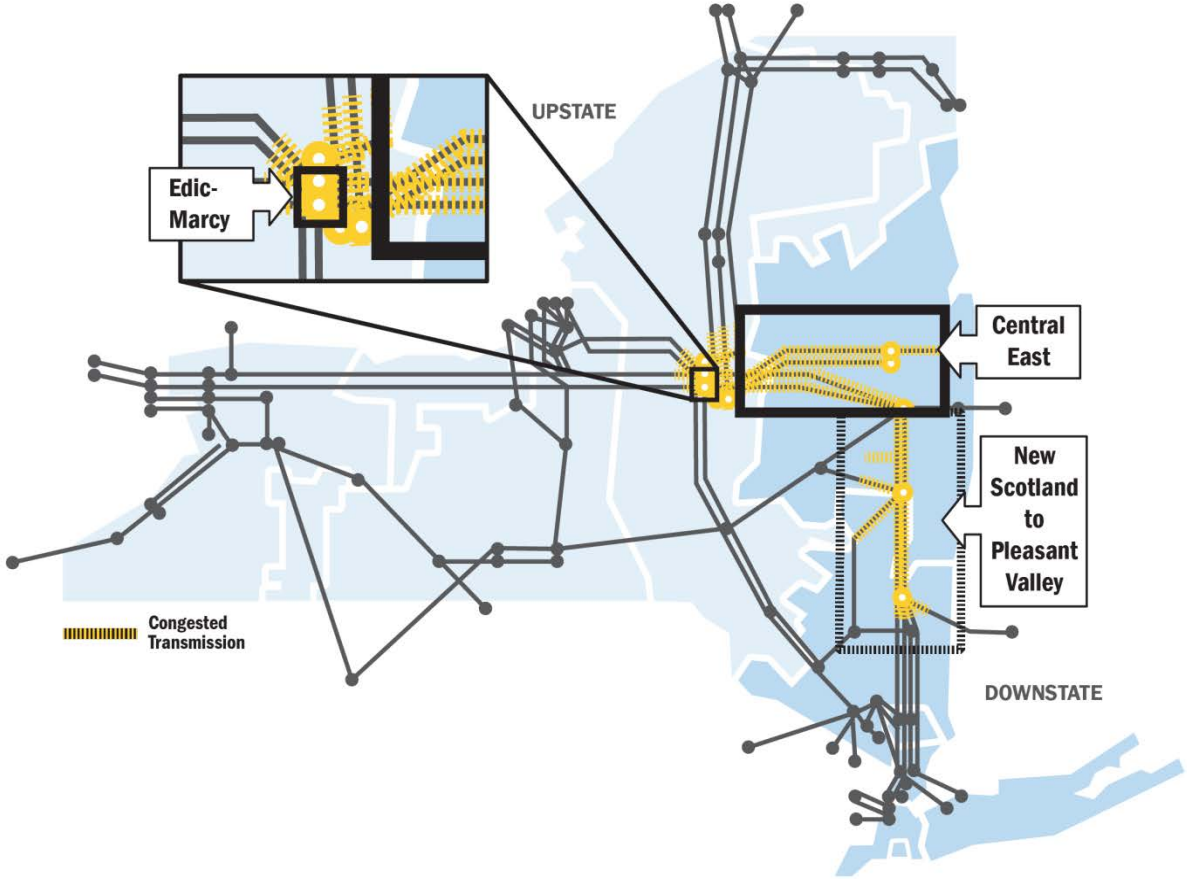
NYISO Economic Planning

- Primary activity is CARIS ("Congestion Assessment and Resource Integration Studies")
- Provides information to stakeholders, developers and other interested parties on congestion across New York Control Area (Phase 1)
- Evaluates specific transmission projects proposed by developers seeking cost recovery through NYISO's Tariff (Phase 2)

CARIS Phase 1

- **Data provided:**
  - Historic and projected congestion
  - Impact of key drivers on system congestion
  - Top congested elements or groupings of elements
  - Estimated cost-effectiveness of generic solutions (i.e., transmission generation, demand response, energy efficiency), based on production cost savings and generic solution costs
  - Other benefits of resolving top constraints
- **Top congested corridors identified based on an analysis of historic and projected congestion and projected potential for production cost savings**

2017 CARIS Groupings



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Key Cases Studied

- **"Business as Usual" BAU Case**
  - Based on currently-defined inclusion rules
  - IPEC, Fitzpatrick and Ginna in-service
  - Cricket Valley(2018), Bayonne Expansion (2018) and CPV Valley (2019) in-service
- **"System Resource Shift" SRS Case**
  - IPEC retired (2020/2021)
  - All NYCA Coal units retired (2020)
  - Resource mix consistent with Clean Energy Standard attainment by 2026
- **SRS/ "Public Policy" PP Scenario**
  - 2026-only
  - SRS Assumptions
  - Western and AC Transmission Public Policy transmission projects in-service

Key Findings: BAU Case

- The results are consistent with prior CARIS studies
- Solutions studied offered a measure of congestion relief and production cost savings
- Transmission projects studied did not result in B/C ratios in excess of 1.0, based on generic cost estimates and production cost savings only.

Key Findings: System Resource Shift Case

Additional 28 TWh of renewable resources in 2026 vs. BAU

Curtailment of Solar and Wind resources – 1.2 TWh, reduction in nuclear output – 0.7 TWh in 2026

SRS vs. BAU

Central East-New Scotland-Pleasant Valley solution produced higher production cost savings (by 61%) and higher Demand$ Congestion savings (by 79%)

Congestion across Central East-New Scotland-Pleasant Valley is $450M higher in 2026 vs. BAU

Net Imports decrease by 14 TWh vs. BAU – NY exports a portion of increased renewable generation

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Key Findings: SRS/PP Scenario (2026)

Additional transmission helps unbottle 0.5 TWh of renewable energy vs. SRS

Output from upstate nuclear units increases by 0.4 TWh vs. SRS

SRS/PP vs. SRS

Reduction of higher congestion observed in SRS at the Central East-New Scotland-Pleasant Valley corridor by $284M

Reduction of 1.6 TWh in output from gas-fired generation in Zones F-K vs. SRS

Overall net imports increase by less than 0.3 TWh (as exports decrease) vs. SRS

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Next Steps

- Present 2017 CARIS Phase 1 Report to NYISO Board
- Conduct Public Information Session
- Proceed with CARIS Phase 2
  - Update and extend CARIS 1 Database until 2036
  - Study specific projects (if requested)
- Solicit Feedback from Stakeholders on CARIS-related Process Improvements
- Engage Stakeholders in Tariff and Manual revisions as part of the "Comprehensive System Planning Process" (CSPP) Reform project

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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