Visualization for 2026–2027 IRM Sensitivities

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**Installed Capacity Subcommittee #307**

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2026-2027 IRM Sensitivity Cases

- **2026-2027 IRM Preliminary Base Case (PBC)**
  - IRM = 27.3%
- **Sensitivity Case 1 (S01): New York Control Area (NYCA) Isolated**
  - IRM = 32.1%
- **Sensitivity Case 2 (S02): No Internal NYCA Transmission Constraints**
  - IRM = 25.1%
- **Sensitivity Case 3 (S03): No Load Forecast Uncertainty**
  - IRM = 21.7%
- **Sensitivity Case 4 (S04): No Wind Capacity**
  - IRM = 20.5%
- **Sensitivity Case 5 (S05): No Special Case Resource (SCR) Capacity**
  - IRM = 24.1%
- **Sensitivity Case 6 (S06): No Winter Fuel Availability Constraints**
  - IRM = 25.5%
- **Sensitivity Case 7a (S07a): Alternative Assumptions for Champlain Hudson Power Express (CHPE) and the Gowanus and Narrows Barges (Barges): CHPE Out-of-Service and Barges In-Service**
  - IRM = 26.5%
- **Sensitivity Case 7b (S07b): Alternative Assumptions for CHPE and Barges: CHPE and Barges Both In-Service**
  - IRM = 27.8%

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S01: NYCA Isolated

- **NYCA is assumed to not get any emergency assistance (EA) from neighboring areas**
  - Due to modeling limitations, this sensitivity is conducted by setting net emergency energy imports to 0 MW. Therefore, EA flow still exists with equal inbound and outbound amounts.
    - Setting all interconnection transfer limits to 0 MW will lead to extremely high LOLE in neighboring systems

- **Result**
  - Lack of EA reduced NYCA reliability.
  - LOLE impact: 0.54 (S01 non-solver) vs 0.1 (PBC).
  - ~1,540 MW of capacity needs to be added back to the model to bring the system back to 0.1 LOLE (32.08% IRM)

Impact of lack of Emergency Assistance on NYCA-wide reliability
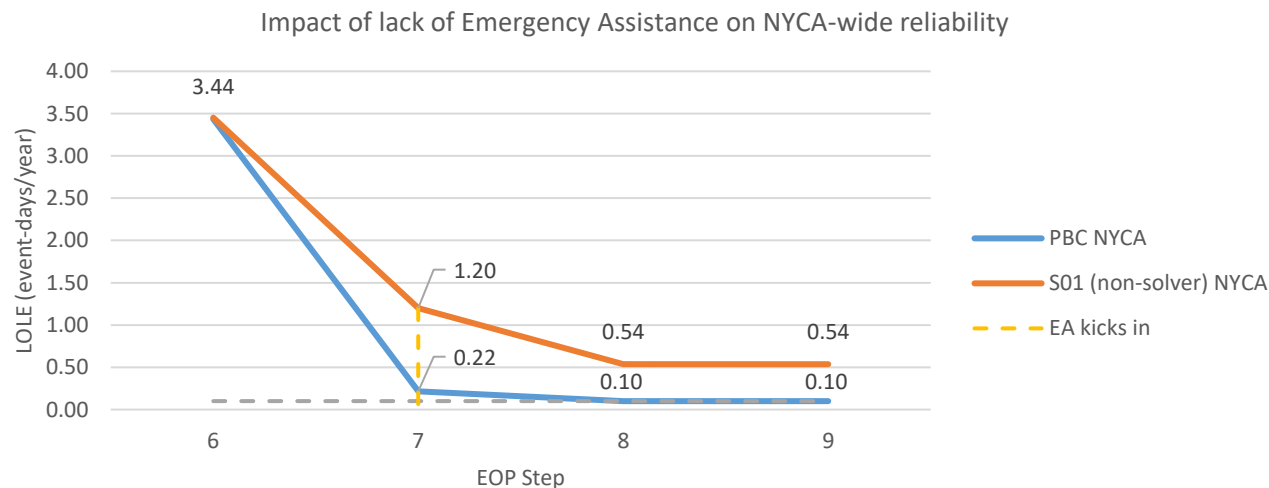
*The chart illustrates the incremental change in LOLE prior to applying the capacity adjustments needed to restore the case to 0.1 LOLE.

S02: No Internal Transmission Constraints

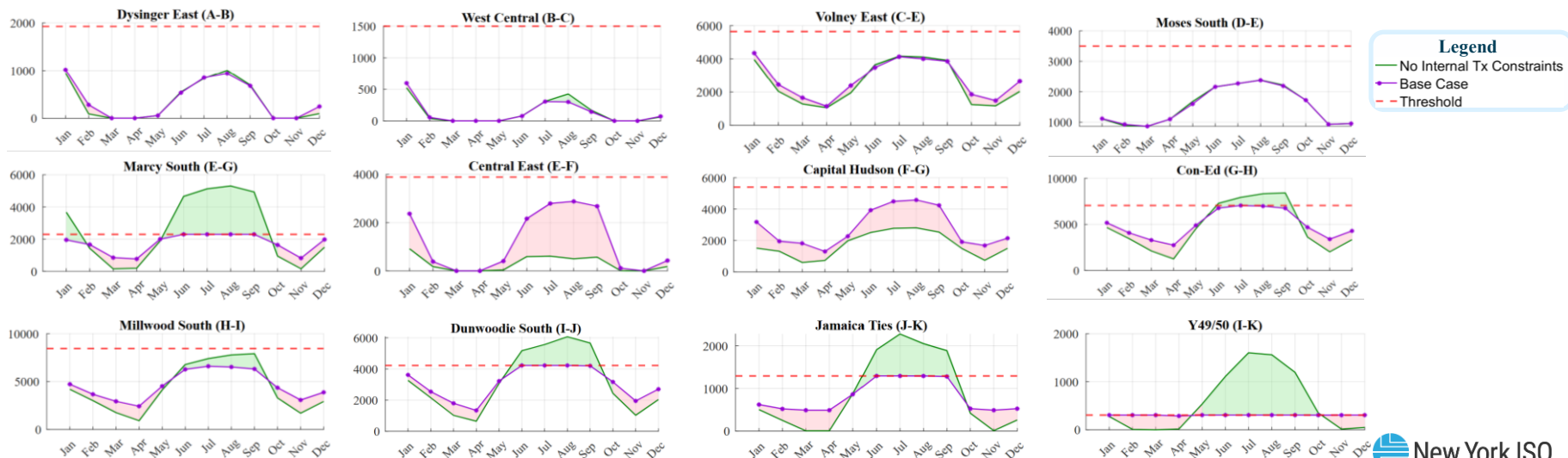- **Base Case with Transmission Constraints (Forward Direction – Upstate to Downstate):**
    - Upstate and Central interfaces (except Marcy South) remain below limits, while Downstate interfaces (except Millwood South) reach their limits.
    - **Two paths from upstate to Load Zone G**: **1)** Marcy South (prioritized path in the simulation), **2)** Central East + Capital Hudson (used when Marcy South reaches the transfer limit)
        - The prioritization reflects **how the GE Multi-Area Reliability Simulation software program (GE MARS) orders interfaces**.

- **No Internal Transmission Constraints (Forward Direction – Upstate to Downstate):**
    - Upstate interfaces (except Marcy South) show similar patterns with slight flow increase on Dysinger East and West Central due to loss of load expectation (LOLE) in Load Zone B.
    - Marcy South flow increases as its limits are ignored, and the flow decreases on Central East and Capital Hudson.
    - UPNY-Con Ed Dunwoodie South, Y49/Y50, and Jamaica Ties carry much higher flows due to high LOLE/load conditions downstate.

- The MARS model prioritizes routing power through Marcy South until it binds, which explains the higher flows on Marcy South and the reductions on Central East and Capital Hudson in the case without internal transmission constraints. This shift reflects the model's path-selection behavior.

*The charts illustrate the incremental change in LOLE prior to applying the capacity adjustments needed to restore the case to the 0.1 criterion.

# S02: No Internal Transmission Constraints (cont.)

- **Base Case with Transmission Constraints (Reverse Direction – Downstate to Upstate):**
 - WC hits the interface limit in reverse flow
  - DE and VE get very close to their limit in July, indicating the potential that they will hit their limit in reverse as load increases upstate
  - Jamaica Ties and Y-49/50 hit their limit in reverse flow.

- **No Internal Transmission Constraints (Reverse Direction – Downstate to Upstate):**
  - DE, WC, VE, flows increase greatly in reverse flow
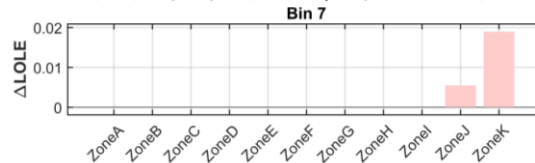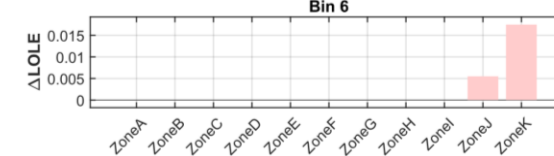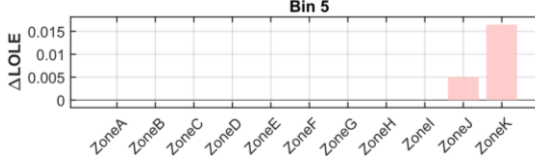 - Y49/Y50 and Jamaica Ties carry much higher flows in reverse flow
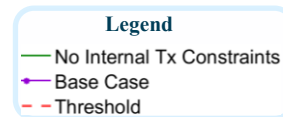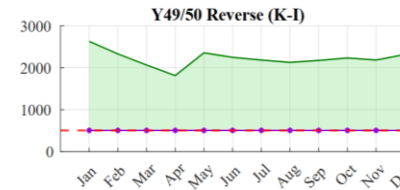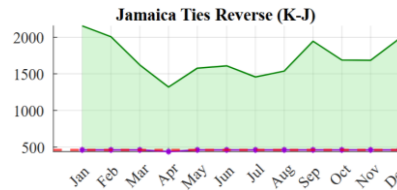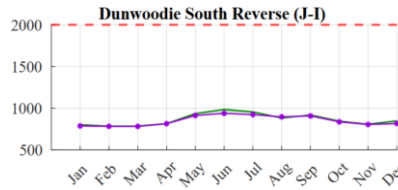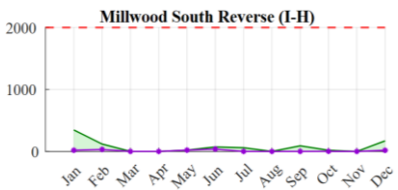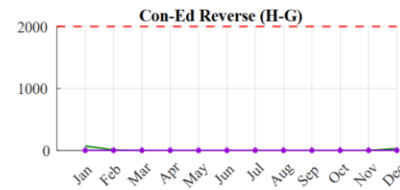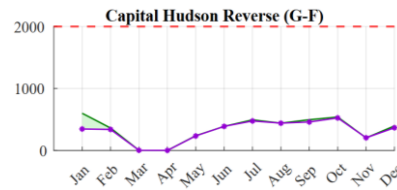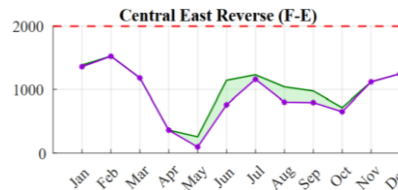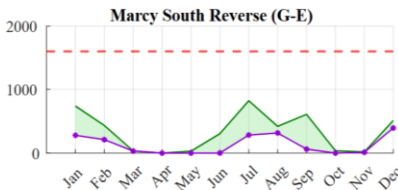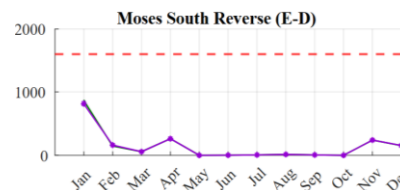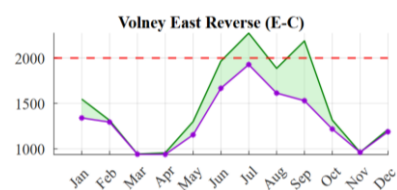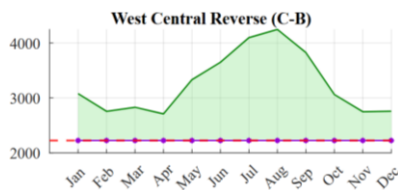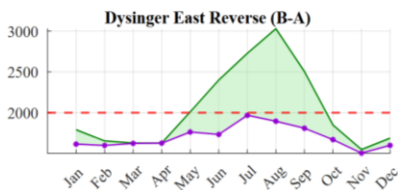
*The charts illustrate the incremental change in LOLE prior to applying the capacity adjustments needed to restore the case to the 0.1 criterion.

S03: No Load Forecast Uncertainty

- 2026-2027 IRM study assumptions: Bins 1–3: load forecast uncertainty (LFU) >100% , Bin 4: base load conditions, Bins 5–7: LFU <100%
- Impact of S03 (No LFU):
  - **Bins 1–3:** Removing LFU decreases modeled load → Lower LOLE → reliability improves.
  - **Bins 4–7:** Removing LFU increases modeled load → Higher LOLE → reliability worsens.
  - Most of the loss of load events occur in Bin 1-3
    - The worsening in Bins 4–7 is very small in magnitude compared to the improvement in Bins 1–3, resulting in overall LOLE and IRM decreases
- **Key findings**
  - The observed LOLE increase in Bins 4–7 is driven by the fact that removing LFU effectively raises load in those bins.

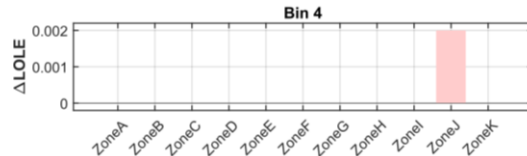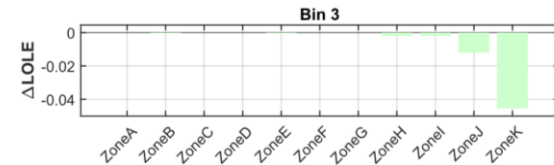## Δ LOLE (S03 – PBC) ; Negative = Decrease , Positive = Increase

*The charts illustrate the incremental change in LOLE prior to applying the capacity adjustments needed to restore the case to the 0.1 criterion.

S03: No Load Forecast Uncertainty (cont.)

- Visible differences of the LFU impact is observed in the model between 2025-2026 and 2026-2027 Capability Year

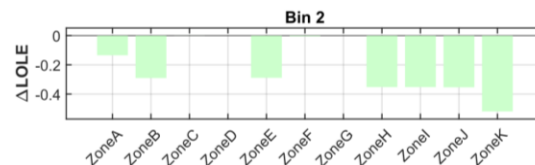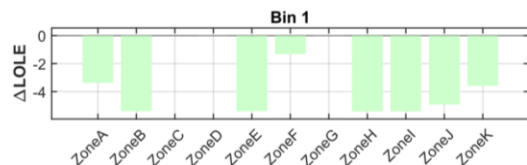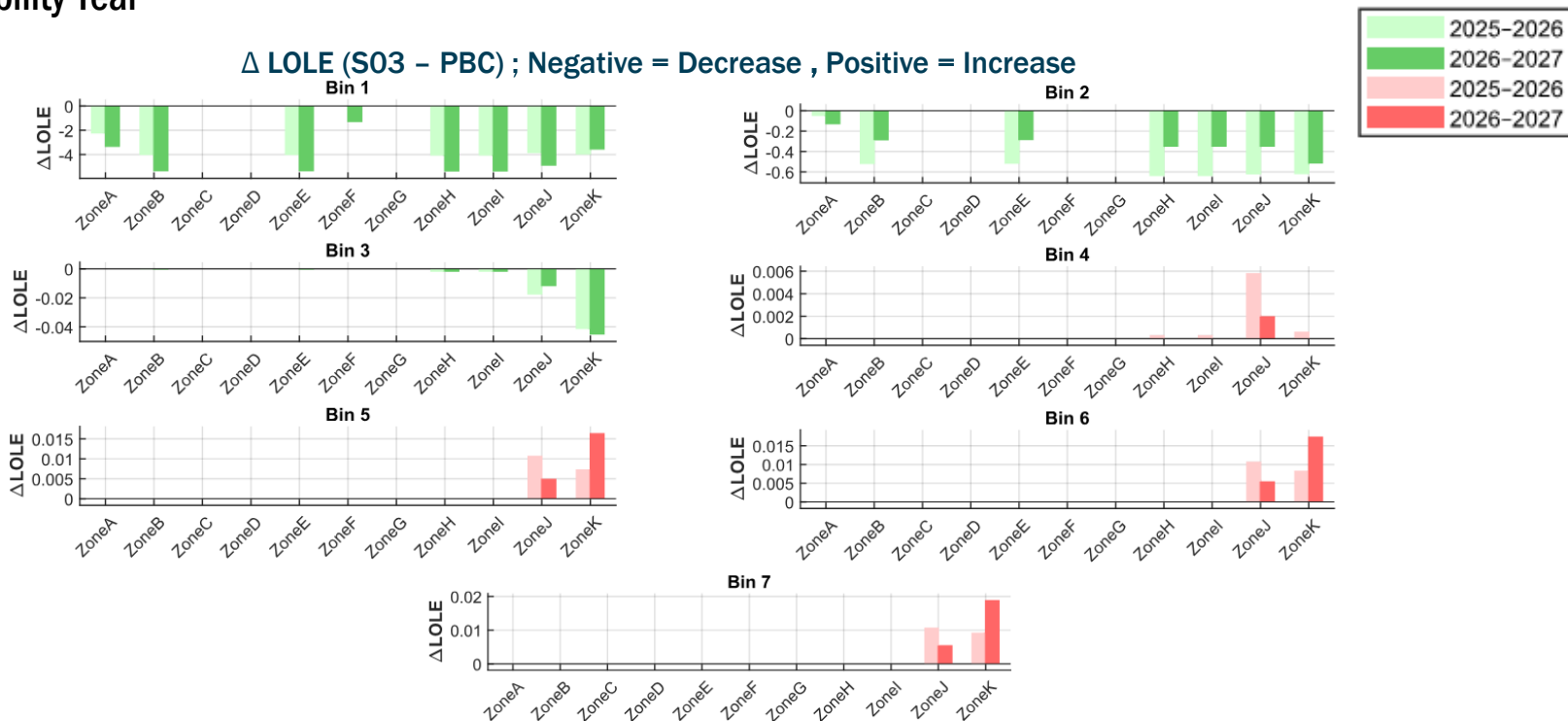Δ LOLE (S03 − PBC) ; Negative = Decrease , Positive = Increase

*The charts illustrate the incremental change in LOLE prior to applying the capacity adjustments needed to restore the case to the 0.1 criterion.

S04: No Wind Capacity

- Removing wind capacity lowers the NYCA average Equivalent Demand Forced Outage Rate (EFORd), which reduces the Installed Capacity (ICAP) needed to meet the 0.1 LOLE criterion.

  - The ICAP reduction from removing wind capacity is greater than the ICAP subsequently added back to restore 0.1 LOLE.

Percentage Change in EFORd after Removing Wind Units

Change in ICAP procured after Removing Wind Units
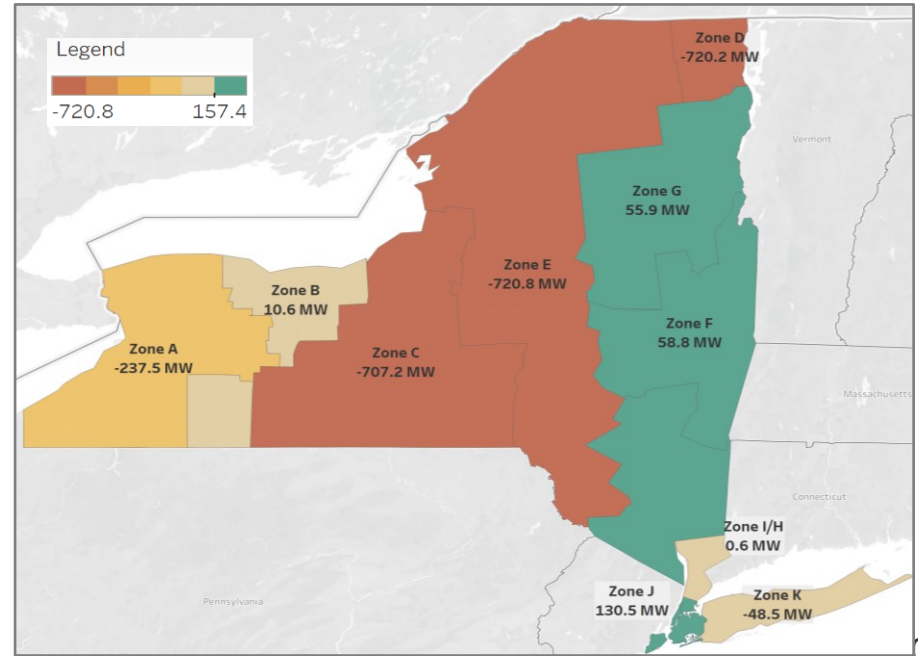
*The charts illustrate the case at 0.1 LOLE criterion.

S05: No SCR Capacity

- **In this sensitivity case, the SCR capacity is assumed as unavailable in the GE MARS model and so is not included in the IRM calculation.**

- **Result**
  - Increased reliance on Emergency Assistance (EOP Step 7) makes up for most of the shortfall in reliability due to loss of SCRs
  - LOLE Impact: 0.14 (S05 non-solver) vs 0.1 (PBC)
  - ~1,030 MW of capacity is removed from the model to bring the system back to 0.1 LOLE (24.09% IRM)
    - IRM reduces because the reduction in modeled capacity from removing SCRs is greater than the ICAP that is then added back to meet 0.1 LOLE.
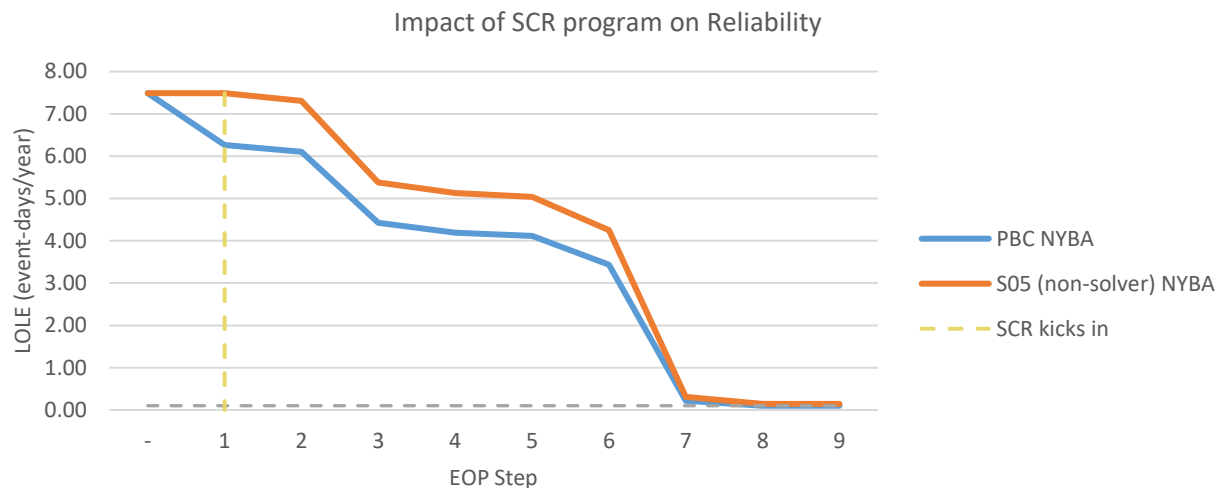
Impact of SCR program on Reliability
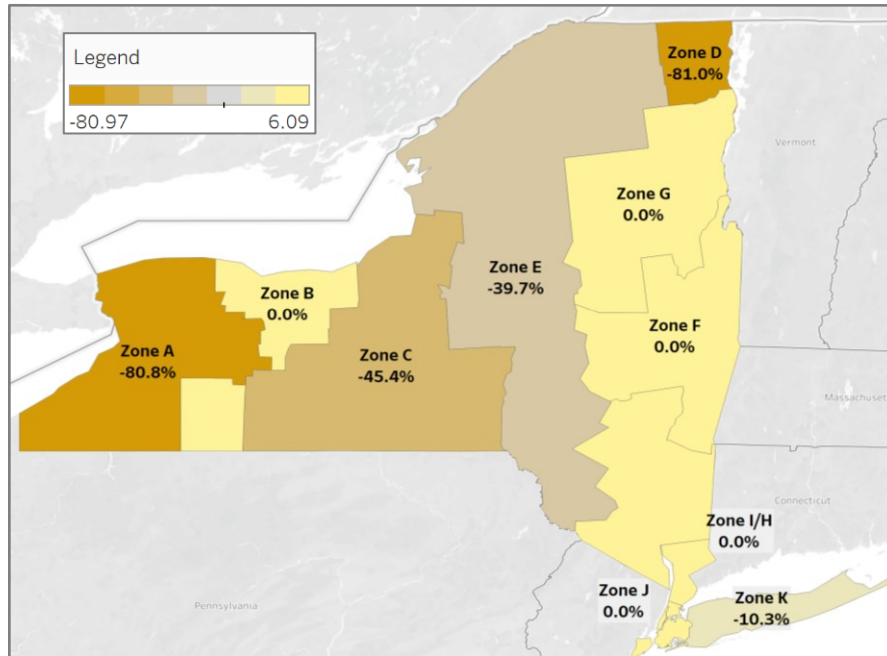
*The charts illustrate the incremental change in LOLE prior to applying the capacity adjustments needed to restore the case to 0.1 LOLE.

# S06: No Winter Fuel Availability Constraints

- **Winter months:** No fuel availability constraints → LOLE drops and as a result less capacity (~580 MW) is needed at criteria.
- **March & April:** No LOLE in either case so there is no change in LOLE; **October & November:** Same LOLE values in PBC and S06 → no change in LOLE
- **Summer months:** Summer LOLE increases because less capacity is needed at criterion due to reduced winter LOLE caused by the removal of winter fuel availability constraints.
- The reduction of winter LOLE is shifted to summer, and less capacity is needed to meet 0.1 LOLE criterion

Δ LOLE (S06 – PBC) ; Negative = Decrease , Positive = Increase
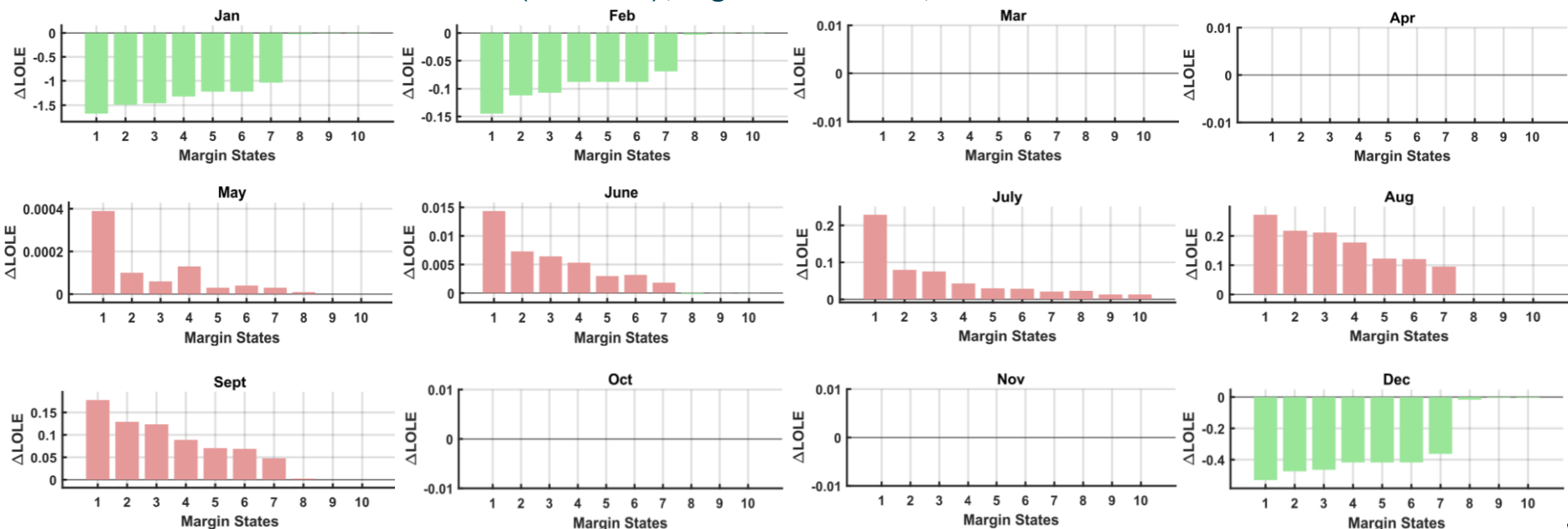
*The charts illustrate the case at 0.1 criterion. Margin States = EOP step # +1 (e.g., Margin State 1 = EOP Step 2)

S06: No Winter Fuel Availability Constraints (cont.)

Seasonal LOLE Comparison: 2026-2027 IRM PBC vs No Winter Fuel Availability Constraints (S06)
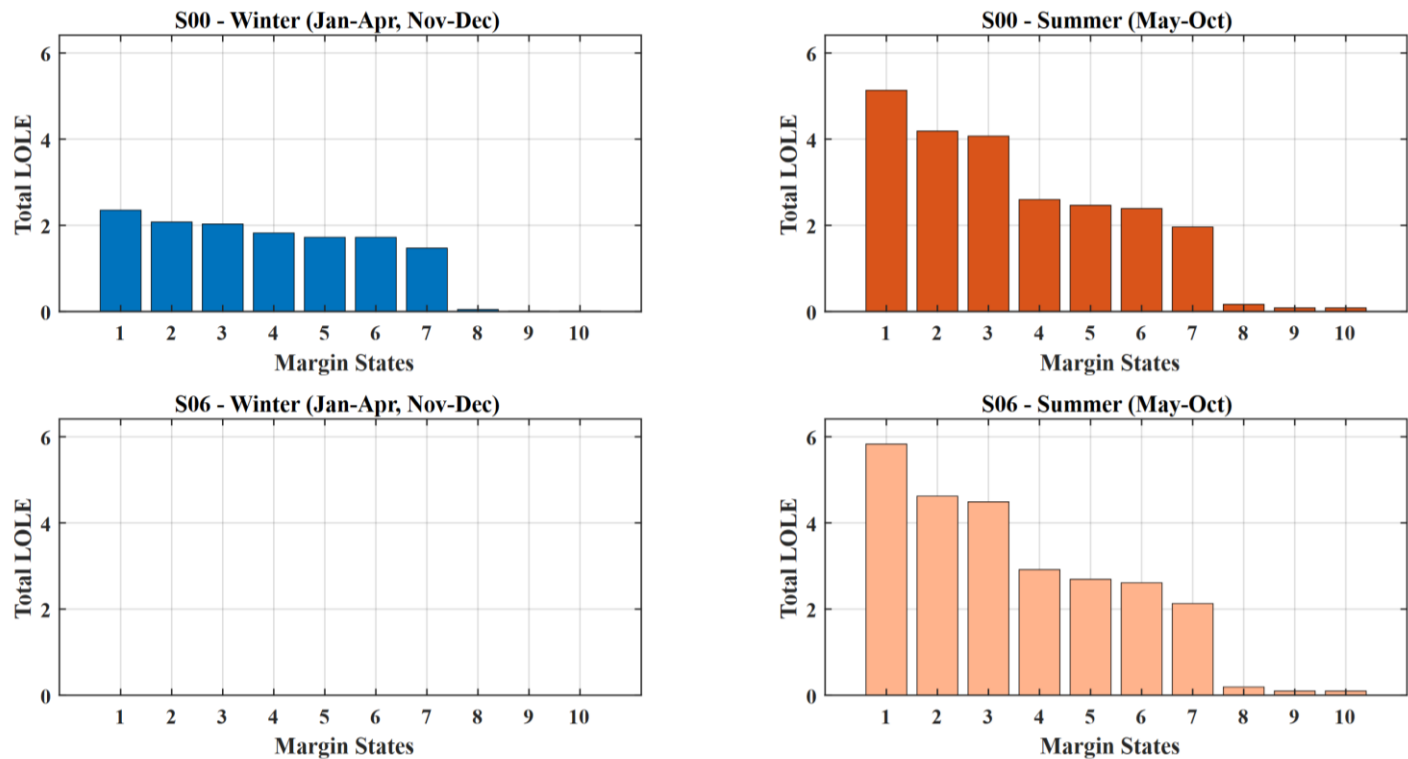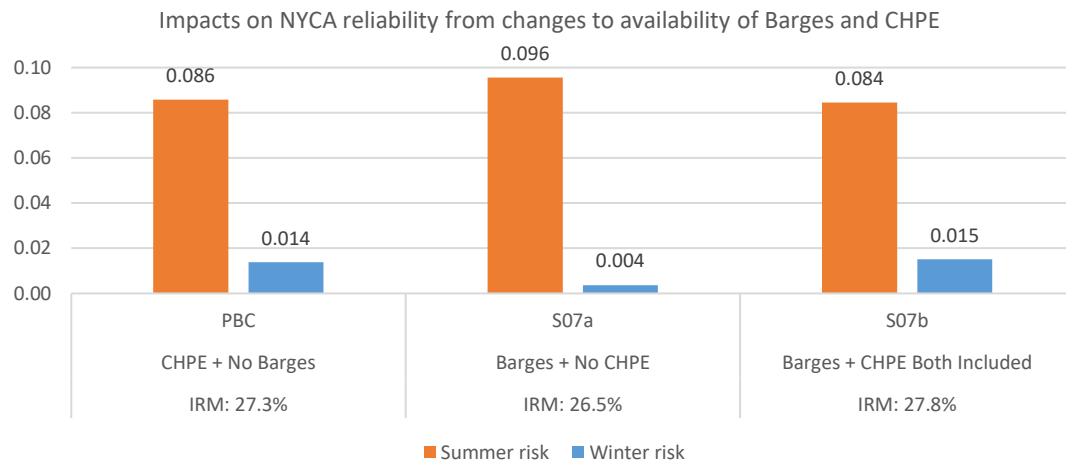
*The charts illustrate the case at 0.1 criterion. Margin States = EOP step # +1 (e.g., Margin State 1 = EOP Step 2)
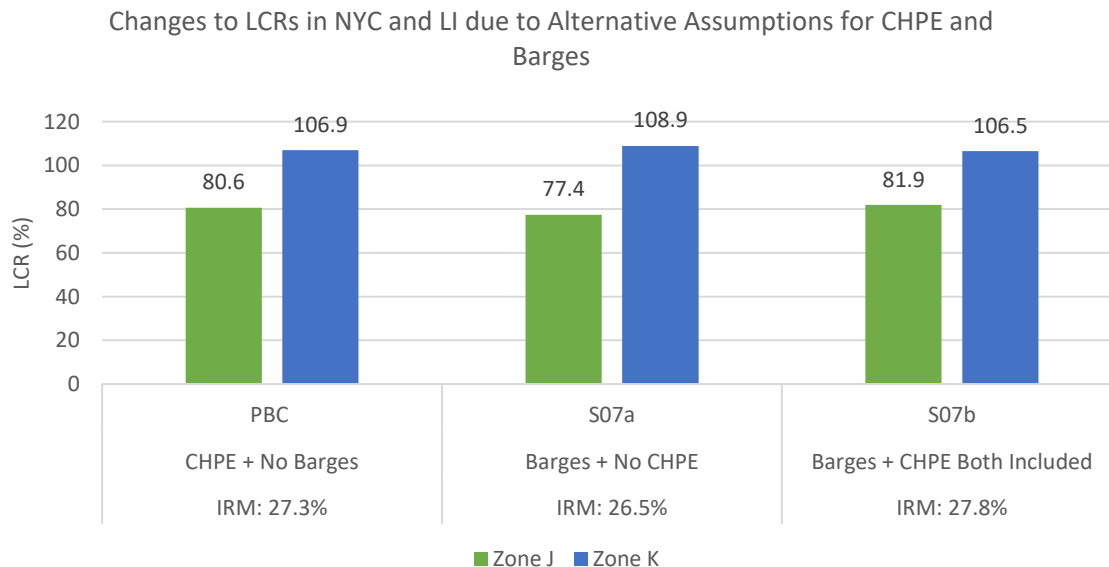
S07: Alternate Assumptions for CHPE and Barges

- **Assess the impact of modeling alternative assumptions for the status of CHPE and the Gowanus and Narrows barges**
  - 2026-2027 IRM PBC: assumes CHPE in-service and barges out-of-service
- **S07a: assumes CHPE is not in service and the barges are in service**
- **S07b: assumes both CHPE and the barges are in service**
- **Result**
  - S07a: Lower winter risk and higher summer risk, by about 0.01 LOLE or 10%. IRM reduces to 26.5%, down by 0.8% compared to the PBC. Removing CHPE from the model eliminates interactions with the winter fuel availability constraints modeling, which reduces winter LOLE risk and need for additional winter capacity.
  - S07b: Negligible impact to LOLE, but IRM increases by to 27.8%, up by 0.5% compared to the PBC

Impacts on NYCA reliability from changes to availability of Barges and CHPE

	PBC CHPE + No Barges IRM: 27.3%	S07a Barges + No CHPE IRM: 26.5%	S07b Barges + CHPE Both Included IRM: 27.8%
Summer risk	0.086	0.096	0.084
Winter risk	0.014	0.004	0.015

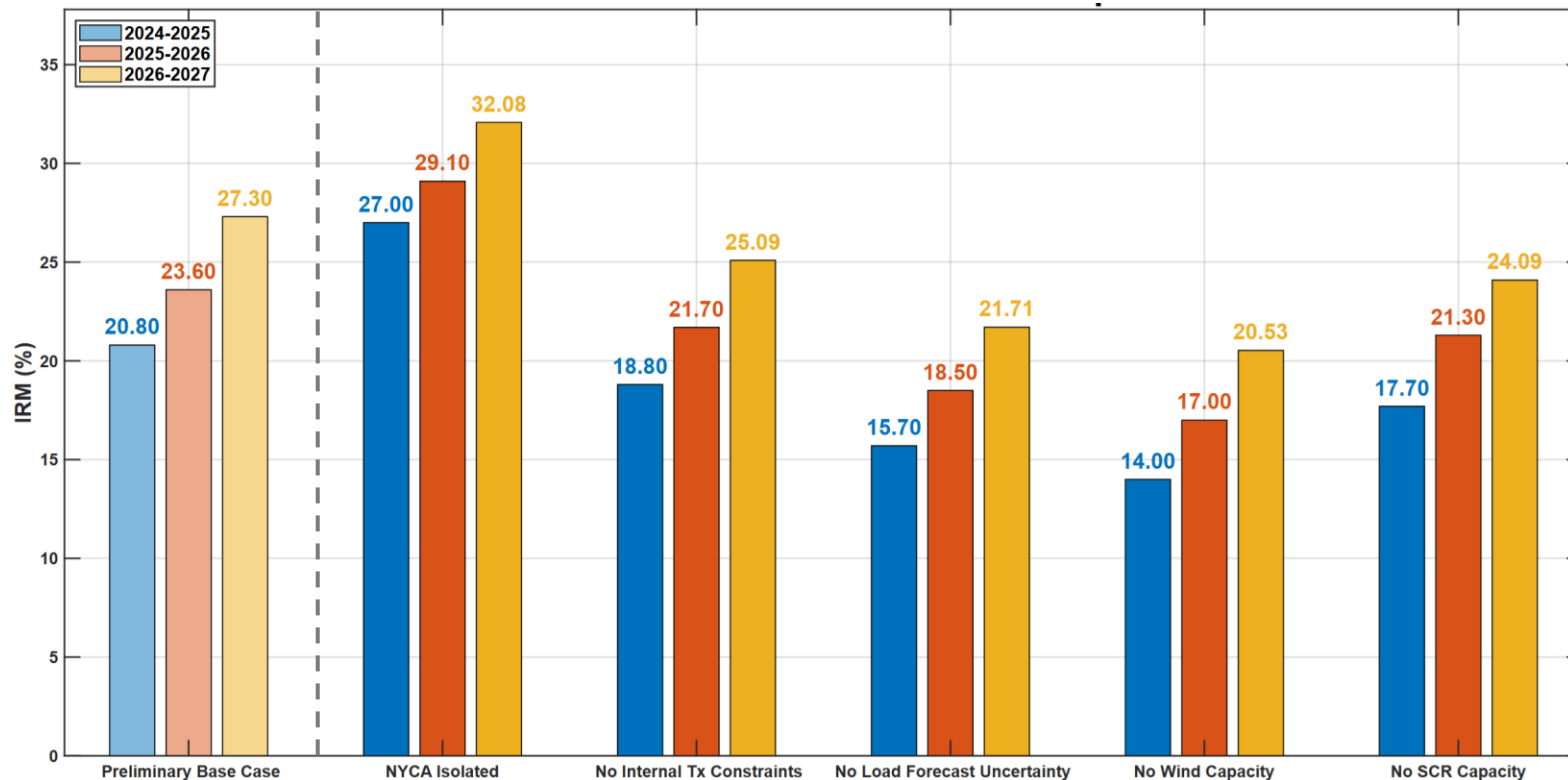■ Summer risk   ■ Winter risk

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S07: Alternate Assumptions for CHPE and Barges (cont.)

- **Chart below shows the impacts of these alternative assumptions to the locational capacity requirements (LCRs) in Load Zones J (NYC) and K (LI)**

- **Results**

  - S07a: Compared to the PBC, the LCR in Load Zone J decreased by 3.2% or ~350 MW, and the LCR in Load Zone K increased by 2% or ~100 MW

  - S07b: Compared to the PBC, the LCR in Load Zone J increased by 1.2% or ~140 MW, and the LCR in Load Zone K decreased by 0.4% or 23 MW

Changes to LCRs in NYC and LI due to Alternative Assumptions for CHPE and Barges

	PBC	S07a	S07b
Zone J	80.6	77.4	81.9
Zone K	106.9	108.9	106.5
	CHPE + No Barges	Barges + No CHPE	Barges + CHPE Both Included
	IRM: 27.3%	IRM: 26.5%	IRM: 27.8%

■ Zone J ■ Zone K

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Three-Year Historical Comparison (PBC and S01-S05)

Questions?

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Our Mission and Vision

✓

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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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