New York ISO
Independent System Operator

2026-2027 IRM Study Special Sensitivities

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Installed Capacity Subcommittee #307

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Agenda

- Interaction Between Winter Fuel Availability Constraints and Champlain Hudson Power Express (CHPE)
- Sensitivity Case 6 (S06): No Winter Fuel Availability Constraints
- Sensitivity Case 7a (S07a): Barges + No CHPE
- Sensitivity Case 7b (S07b): Barges + CHPE Both Included
- Tan45 Curves Comparison

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Interaction Between Winter Fuel Availability Constraints and CHPE – Illustrative Example

Base Case*

IRM: 24.64%	Summer	Winter
ICAP Modeled	40,753	41,428
ICAP After Adjustments	40,087	40,762
LOLE	0.100	-

* Assumptions: No Winter Fuel Availability Constraints or CHPE, and barges modeled as retired

Add Fuel Constraints

IRM: 24.64%	Summer	Winter
ICAP Modeled	40,753 —	41,428 —
ICAP After Adjustments	40,087 —	40,762 —
LOLE	0.107 ↑	0.006 ↑

Bring Case to 0.1 LOLE

(Add 152 MW ICAP Annually)

The additional ICAP reduces Summer LOLE (-0.012) more than Winter LOLE (-0.001)

IRM: 25.11%	Summer	Winter
ICAP Modeled	40,753 —	41,428 —
ICAP After Adjustments	40,239 ↑	40,914 ↑
LOLE	0.095 ↓	0.005 ↓

Add CHPE (1,250 MW in summer only)

The additional ICAP from CHPE benefits Summer LOLE significantly (-0.063) with no reduction to Winter LOLE.

IRM: 28.99%	Summer	Winter
ICAP Modeled	42,003 ↑	41,428 —
ICAP After Adjustments	41,489 ↑	40,914 —
LOLE	0.032 ↓	0.005 —

Bring Case to 0.1 LOLE

(Remove 908 MW ICAP Annually)

Significant quantity of ICAP is removed to bring the case to 0.1 LOLE. Both Summer and Winter LOLE increase due to the removal of capacity annually.

IRM: 26.17%	Summer	Winter
ICAP Modeled	42,003 —	41,428 —
ICAP After Adjustments	40,581 ↓	40,006 ↓
LOLE	0.086 ↑	0.014 ↑

- ICAP Modeled: Amount of ICAP (MW) modeled in total in NYCA system
- ICAP After Adjustment: Amount of ICAP (MW) in NYCA system after adjusting to LOLE specified in each case

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Interaction Between Winter Fuel Availability Constraints and CHPE (cont.)

- As outlined in the flow chart on the previous slide, there is an interaction between winter fuel availability constraints and CHPE that increases the amount of winter risk on the system
- Capacity is removed on an annual basis to achieve the 0.1 annual LOLE criteria resulting in the potential for a resource with material seasonal differences in capacity availability to exacerbate the risk in the season in which it is unavailable/less available
  - For example, the addition of CHPE, which is modeled in the 2026-2027 IRM Preliminary Base Case (PBC) as a summer-only resource, increases the amount of winter LOLE risk
- Moving from the base case to the final case on the previous slide which are both at 0.1 annual LOLE, the amount of capacity available in summer increases by 494 MW (40,087 → 40,581) whereas the amount of capacity available in winter decreases by 756 MW (40,762 → 40,006)
- When both assumptions are modeled together, the impact to the IRM is also larger than aggregating the impact of modeling each assumption separately
  - Prior testing showed less than 5% winter LOLE introduced by winter fuel availability constraints model
  - In combination with CHPE, the winter LOLE in the 2026-2027 IRM PBC is ~14%

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S06: No Winter Fuel Availability Constraints

- NYSRC requested a Tan45 case to analyze the impact of removing the winter fuel availability constraints modeling from the 2026-2027 IRM PBC
  - Consistent with the 2026-2027 IRM PBC, CHPE was modeled as in-service and the barges were represented as out-of-service
- The sensitivity case showed a 1.8% decrease to the IRM and eliminated all winter LOLE risk from the model
- Prior testing showed a smaller increase to IRM (~0.5%) from the addition of the winter fuel availability constraints modeling, however these test cases were conducted without the addition of CHPE[1]
- The interaction between fuel availability constraints and CHPE results in a larger impact to IRM than was present in previous test cases, as addressed in previous slides

Case	2026-2027 IRM PBC	S06a: No Winter Fuel Availability Constraints	Delta
IRM	27.3%	25.5%	-1.8%
Load Zone J LCR	80.6%	79.6%	-1.0%
Load Zone K LCR	106.9%	107.4%	+0.5%
Summer LOLE Risk	86.2%	100.0%	+13.8%
Winter LOLE Risk	13.8%	0.0%	-13.8%

[1] Fuel Availability Constraints Modeling Phase 2: https://www.nysrc.org/wp-content/uploads/2025/04/4.1.2-Fuel-Availability-Constraints-Modeling-Phase-2-r1-04112025-EC-Attachment-4.1.2.pdf

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S07a: Barges + No CHPE

- NYSRC requested a Tan45 case to analyze the impact of removing CHPE and representing the Gowanus and Narrows barges in-service in the 2026-2027 IRM PBC
- The sensitivity case showed a 0.7% decrease to the IRM and 3.2% decrease to the Load Zone J locational capacity requirement (LCR)
- The Load Zone J LCR decrease is driven largely by the reduction in net ICAP supply in the load zone (~737 MW) resulting from the removal of CHPE and addition of the barges
- With the winter fuel availability constraints modeled and the barges in-service, the winter LOLE declines to 3.7%.
- As described on previous slides, the interaction between winter fuel availability constraints and CHPE is a driver of the IRM decrease and reduction in winter LOLE risk when CHPE is removed from the model

Case	2026-2027 IRM PBC	S07a: Barges + No CHPE	Delta
IRM	27.3%	26.6%	-0.7%
Load Zone J LCR	80.6%	77.4%	-3.2%
Load Zone K LCR	106.9%	108.9%	+2.0%
Summer LOLE Risk	86.2%	96.3%	+10.1%
Winter LOLE Risk	13.8%	3.7%	-10.1%

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S07b: Barges + CHPE In-Service Results

- NYSRC requested a Tan45 case to analyze the impact of representing both CHPE and the Gowanus and Narrows barges as in-service in the 2026-2027 IRM PBC
- The sensitivity case showed a 0.5% increase to the IRM and 1.3% increase to the Load Zone J LCR
  - Results are consistent with prior test cases assessing the potential impacts of the NYSDEC "peaker rule"[1]
- The primary driver of the increase in both IRM and Load Zone J LCR is the impact of the barges on the NYCA and Load Zone J average Equivalent Demand Forced Outage Rate (EFORd)
- Modeling the barges as in-service increases the winter LOLE from 13.8% to 15.2%, despite increasing the assumed quantity of available fuel under the fuel availability constraints modeling (more information on the following slide)
- The winter LOLE values from S07b (~15%) and S07a (~3%) indicate that the addition of CHPE, as modeled in the 2026-2027 IRM PBC, appears to increase the winter LOLE by ~12% due to the previously discussed interactions with the winter fuel availability constraints modeling

Case	2026-2027 IRM PBC	S07b: Barges + CHPE Both Included	Delta
IRM	27.3%	27.8%	+0.5%
Load Zone J LCR	80.6%	81.9%	+1.3%
Load Zone K LCR	106.9%	106.5%	-0.4%
Summer LOLE Risk	86.2%	84.8%	-1.4%
Winter LOLE Risk	13.8%	15.2%	+1.4%

[1] IRM 2023 Preliminary Base Case Parametric Results: https://www.nysrc.org/wp-content/uploads/2023/05/IRM-2023-Preliminary-Base-Case-Parametric-Results_8_3.pdf

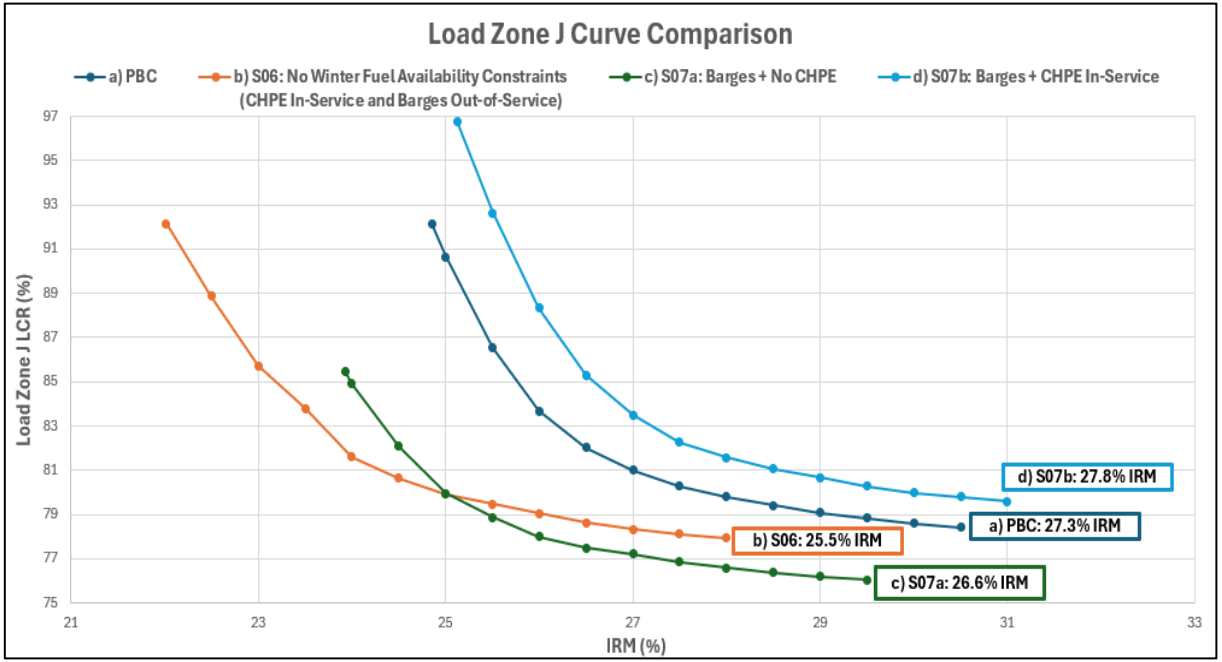
S07b: Barges + CHPE In-Service Winter Fuel Availability Constraints Assumptions

- The winter fuel availability constraints modeling assumptions were recalibrated to include the barges in the datasets utilized to calculate the available gas and available oil assumptions
- The inclusion of the barges in the datasets does increase the amount of total available fuel assumed in the winter fuel availability constraints modeling, but the overall winter LOLE increases because the increase to the assumed levels of available fuel is outweighed by the increase in modeled capacity and the impact to the EFORd values

IRM 2026-2027 PBC Assumptions						
Tier	NYCA Load Conditions (MW)	Available Gas (MW)	Available Oil (MW)	Total Available Fuel (MW)	Modeled UCAP (MW)	Derate (%)
1	>26,000	300	11,525	11,825	19,230	**38.5%**
2	25,000 - 26,000	600		12,125		**36.9%**
3	24,000 - 25,000	2,550		14,075		**26.8%**
4	23,000 - 24,000	4,200		15,725		**18.2%**
5	22,000 - 23,000	5,575		17,100		**11.1%**
6	<22,000	No Constraint		No Constraint		**No Constraint**

S07b Winter Fuel Availability Assumptions						
Tier	NYCA Load Conditions (MW)	Available Gas (MW)	Available Oil (MW)	Total Available Fuel (MW)	Modeled UCAP (MW)	Derate (%)
1	>26,000	287.5	11,750	12,038	19,790	**39.2%**
2	25,000 - 26,000	575		12,325		**37.7%**
3	24,000 - 25,000	2,550		14,300		**27.7%**
4	23,000 - 24,000	4,200		15,950		**19.4%**
5	22,000 - 23,000	5,575		17,325		**12.5%**
6	<22,000	No Constraint		No Constraint		**No Constraint**

Tan45 Load Zone J LCR Curve Comparison



- The chart to the left shows a comparison of the Load Zone J LCR Tan45 curves for the 2026-2027 IRM PBC and 3 special sensitivities (S06, S07a, and S07b)
- Between the PBC and S06 (a to b), the curve shifts to the left due to the decreased winter risk caused by the removal winter fuel availability constraints
- Between the PBC and S07a (a to c), the curve shifts down and to the left due to the decrease in ICAP in Load Zone J and the decrease in winter risk caused by the removal of CHPE
- Between S07a and S07b (c to d), the curve shifts up and to the right due to the increase in ICAP in Load Zone J and the impact to the average EFORd values caused by the addition of the barges

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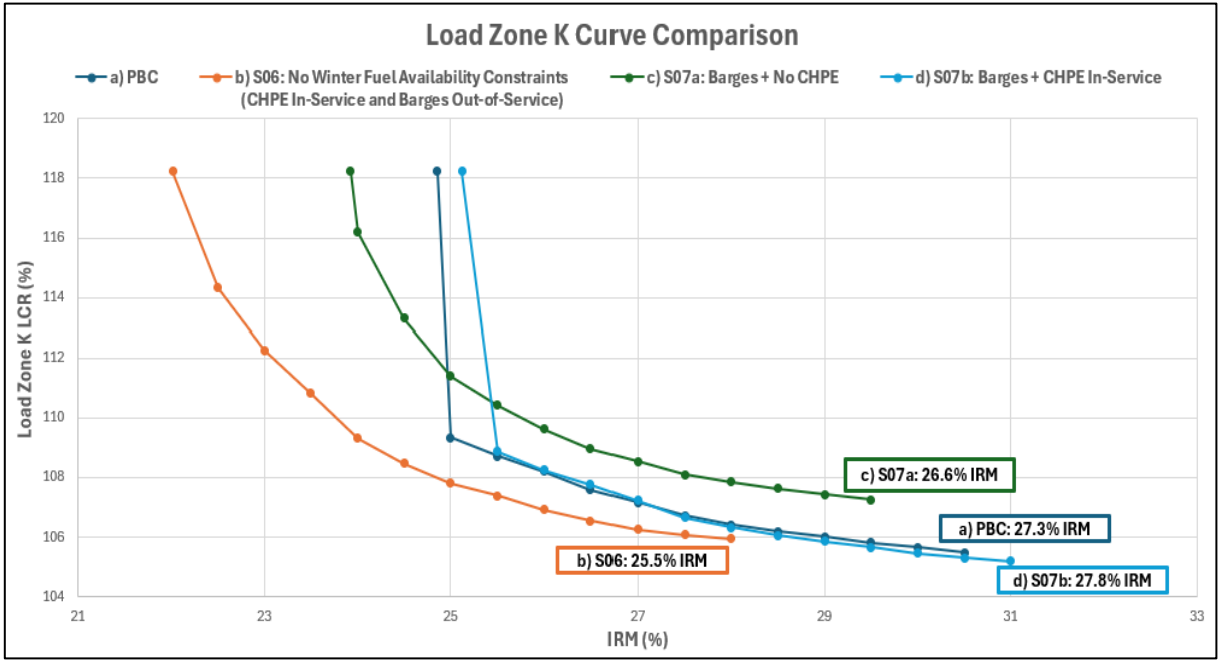
Tan45 Load Zone K LCR Curve Comparison



- The chart to the left shows a comparison of the Load Zone K LCR Tan45 curves for the PBC and 3 special sensitivities (S06, S07a, and S07b)
- Between the PBC and S06 (a to b), the curve shifts to the left due to the decreased winter risk caused by the removal of winter fuel availability constraints
- Between the PBC and S07a (a to c), the curve shifts up and to the left due to the decrease in winter risk caused by the removal of CHPE
- Between S07a and S07b (c to d), the curve shifts right due to the impact to the average EFORd values caused by the addition of the barges
- The interaction between CHPE and winter fuel availability constraints seems to lead to a steepening of the Load Zone K curve, as evidenced by the curves for the PBC and S07b
  - NYISO will continue to investigate this observed outcome

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Results Summary

- The winter fuel availability constraints modeling introduces winter LOLE into the IRM model, and the addition of CHPE (modeled as a summer-only resource) further increases that winter LOLE
- Modeling the barges as in-service increases the IRM, Load Zone J LCR, and the winter LOLE due to the impact on the system and zonal average EFORd values and the increase in average aggregate derates in the winter fuel availability constraints modeling
- The steep Load Zone K Tan45 curve shape is present in cases that represent the combination of CHPE in-service and winter fuel availability constraints
  - Further analysis will be conducted to investigate this observed outcome

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Questions?

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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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