New York ISO
Independent System Operator

2025 Study of Winter Fuel Constraints in New York State Prepared by ICF Resources, LLC

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Purpose of Today's Presentation

- During the 3/4/2026 ICS meeting, the NYISO presented an overview of the ICF Resources, LLC (ICF) 2025 Study of Winter ICF Fuel Constraints In New York State (ICF Study) (3/4/2026 ICS Presentation)
- This presentation provides the Executive Committee (EC) with a summary of the key information discussed at the 3/4/2026 ICS meeting and next steps

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Overview and Assumptions

Overview of the ICF Report

1. "This report begins with an overview of New York's (NY) fuel transportation infrastructure, with a focus on natural gas and oil supply and delivery." (Section 2)
2. "What follows is a summary of ICF's natural gas and fuel oil demand forecasting methodology and results for New York, focusing on the key drivers used to estimate future gas needs." (Section 3.1)
3. … "summarizes ICF's methodology to determines fuel demand from power plants during a peak winter week between 2025 and 2035" and "summarizes the capacity of thermal generators in the New York ISO footprint by fuel type in 2025." (Section 3.2.1 and Section 3.2.2)
4. … "presents results from the gas supply scenarios" in which, among other things, it "summarizes the modeled natural gas supply for the power sector across all NYISO Load Zones during the winter 2024-25 Capability Period for the Coincident Peak Supply Design Day scenario" that "are derived from the modeled supply-side analysis conducted for this study." (Section 3.2.3)
5. "The power sector demand results evaluate the balance between reallocated gas supply and Zonal power demand, subtracting power sector demand from the available gas supply across supply scenarios to identify any shortfalls in daily gas supply for thermal generation." (Section 3.2.4)
6. Reviews "historical distillate and residential fuel oil consumption" and "stocks" and "modeled distillate and residential fuel oil stocks during peak day demand" (Section 3.3)
7. Conclusion (Section 4)

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Several Noteworthy Study Assumptions

- **"ICF analyzed the customer nominations data between 1/1/2019 and 2/28/2025 to construct two scenarios that characterize a lower and upper bound of potential pipeline deliveries into New York"** (Section 2.1.1)
  - "The Coincident Peak Supply scenario is characterized by the maximum physical interstate pipeline deliveries observed on any given day over the last five winters. This day occurred on February 3, 2023, when 7,105 MMcf were delivered to receipt points within New York."
  - "The Non-Coincident Peak Supply scenario is characterized by the sum of the maximum physical interstate pipeline deliveries to each delivery point within New York. This scenario has not occurred on any specific day, and delivery point peak deliveries happened from 2019 to 2025. Non-coincident pipeline supply to New York is 9,667 MMcf/d"
- **"This analysis isolates fuel supply as a key variable and examines its impacts on power sector fuel availability and generation."** (Section 3.2) **"Beyond fuel availability, additional factors may impact generator dispatch during winter peak hours and days," such as "[f]uel costs, procurement approaches, various operational and permitting limitations on the various fuels, participation in NYISO markets that require reserve products . . . ."** (Section 3.2.4) **"[N]ot all factors impacting dispatch and fuel choice are incorporated into the quantitative analysis given the lack of publicly available information and given the intent of this analysis to focus on the fuel availability."** (Section 3.2.4)
- **The study "quantifies the theoretical maximum demand for natural gas and oil that could result from the dispatch of the universe of generators identified in the [study]"** (Section 3.2) **and uses "fuel-specific full-load heat rates for each generator." "[F]uel-specific heat rates were derived from the EPA's Clean Air Markets Program Data (CAMPD)."** (Section 3.2.2)

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Several Noteworthy Study Assumptions (cont.)

Winter Demand (Section 3.2.3)

- "For the peak winter week, Days 1-3 and 5-7 are classified as Non-Design Days and utilize January 2025 weather data to forecast firm gas customer demand. Supply side results for Day 4 vary depending on the weather assumptions. Day 4 demand varies depending on the demand scenario selected below."
- "Five different assumptions for Peak Week, Day 4 are examined in this study,"
  1. "First, this study examines the supply conditions during a peak winter day that reflects a design day – a natural gas utility planning standard that gas utilities specifically plan supply for." (Section 3.2.3)
  2. "Second, this analysis incorporates the peak day weather assumptions that align with NYISO's assumptions for load forecast Bins 1, 4, and 7. NYISO temperature assumptions for the peak day for these Load Bins served as inputs for regressions that forecast utility demand for non-power sectors to determine the available supply for power generation." (Section 3.2.3)
  3. "Third, weather assumptions consistent with the coldest day of the 2024/25 winter served as inputs into the demand regressions to determine the fuel supply for electric power generation" (Section 3.2.3)

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Several Noteworthy Study Assumptions (cont.)

Fuel Switching

- "[F]uel switching scenarios assumes [sic] that all generators capable of running on oil do so" (Section 3.2.1)
- "[I]n the Partial Fuel Switch Scenario only units considered without firm fuel supply shift to backup fuels[,]" (Executive Summary) and the approach "utilizes historical operating data and information gained from generator interviews to identify units that would not fuel switch under this condition and instead continue to have gas demand" (Section 3.2.2)

Pipeline Expansion Scenario (Table 51. Pipeline Projects assumed for Pipeline Expansion Scenario)

Project Name	Pipeline Expansion Capacity (MMcf/d)	Zone Name	Load Zone Capacity Impact (MMcf/d)	Potential In-Service Date
Iroquois Enhancement by Compression (ExC)	125	J	62.5	November 1, 2027
		K	62.5	
Transco Northeast Supply Enhancement (NESE)	400	J	400	November 1, 2027
Williams Constitution Pipeline	200	E	75	July 1, 2027
		F	75	
		J	25	
		K	25	

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Assessments and Conclusions

Assessment of Fuel Supply and Delivery

- "[T]his analysis … primarily focuses on the Coincident Peak Supply scenario. As the scenario with the highest deliveries over the last six years, it is seen as the more realistic scenario of potential supply to the state and is assumed to carry less risk to potential overstate supply and therefore understate unserved capacity" (Section 2.1.1)
  - "The Coincident Peak Supply scenario is characterized by the maximum physical interstate pipeline deliveries observed on any given day over the last five winters. This day occurred on February 3, 2023, when 7,105 MMcf were delivered to receipt points within New York." (Section 2.1.1)
  - The capacity figures in Section 2.1.2 Table 2 (Zonal Total Interstate Pipeline Capacity) "represent the current physical pipeline capacities that ICF incorporated into its Zone-level modeling and analysis."

- For oil supply, "[t]he distribution of terminal infrastructure leads to variations in supply accessibility across NYISO Zones. Zones J and K, and to a lesser extent Zone G, benefit from proximity to . . . terminal clusters, enabling more efficient and flexible resupply during periods of high winter demand. . . . In contrast, the northern portions of Zones D, E, and F, as well as the southern part of Zone A, are located farther from bulk terminal infrastructure and have limited access to large-scale fuel storage. While some secondary terminals may exist in these areas, deliveries often depend on longer overland routes which are more susceptible to weather-related disruptions and logistical delays." (Section 2.2.1)

Table 2

Zone Name	Coincident Peak Supply Existing Capacity (MMcf/d)	Non-Coincident Peak Supply Existing Capacity (MMcf/d)
Zone A	1,197	1,392
Zone B	228	265
Zone C	556	631
Zone D	81	81
Zone E	950	1,175
Zone F	116	390
Zone G	779	1,412
Zone H	160	181
Zone I	160	181
Zone J	3,085	3,915
Zone K	940	1,065
Total	**8,253**	**10,687**

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Assessment of Fuel Demand

- **"The demand assessment focuses on a seven-day period over the next 10 years. . . . ICF developed regressions that project the firm gas demand for each of the seven days of a peak demand week for the next ten years, based on Zonal temperature assumptions . . . . The regression results, paired with the temperature forecasts, resulted in utility and Zone-specific demand forecasts for each year over a seven-day period"** (Section 3.1)
  - The Section 3.1.3 Table 17 (Zonal Seven-Day Peak Week Peak Demand (MMcf)) "features a peak demand day consistent with historical weather observed on January 22, 2025"
- **"Four additional peak demand forecasts examine potential alternative peak day demands."** (Section 3.1.3)
  - Section 3.1.3 Table 18 (Peak Day Demand Forecast Scenarios (MMcf))

Table 17

Zone Name	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035
Zone A	314	309	461	440	593	560	733	690	427	410	424	407	418	402
Zone B	85	82	125	119	165	157	181	172	115	110	111	106	118	112
Zone C	45	43	72	67	108	99	131	119	77	71	60	56	64	59
Zone D	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Zone E	649	644	710	703	791	782	842	832	781	772	710	703	689	683
Zone F	-	-	9	7	19	16	27	24	8	7	8	6	7	6
Zone G	168	162	225	213	287	269	324	302	278	260	241	228	234	221
Zone H	139	136	167	163	209	201	233	223	211	203	186	180	182	177
Zone I	138	136	163	159	203	196	225	216	204	196	184	178	182	176
Zone J	627	615	918	883	1,425	1,348	1,633	1,539	1,417	1,341	1,131	1,079	1,046	1,001
Zone K	224	225	316	312	520	507	639	622	505	493	474	464	432	423
Total	**2,401**	**2,363**	**3,179**	**3,079**	**4,333**	**4,148**	**4,981**	**4,752**	**4,036**	**3,876**	**3,542**	**3,420**	**3,385**	**3,273**

Table 18

Zone Name	22-Jan-25		Design Day		NYISO Load Bin 1		NYISO Load Bin 4		NYISO Load Bin 7	
	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035
Zone A	733	690	1,298	1,348	994	929	573	544	340	333
Zone B	181	172	275	263	236	223	157	149	95	91
Zone C	131	119	327	293	233	211	108	98	46	44
Zone D	13	13	13	13	13	13	13	13	13	13
Zone E	842	832	994	1,067	971	957	801	792	632	627
Zone F	27	24	62	59	55	49	18	16	0	(1)
Zone G	324	302	432	371	391	361	266	250	180	172
Zone H	233	223	314	297	271	259	196	190	146	144
Zone I	225	216	314	297	268	255	198	191	149	146
Zone J	1,633	1,539	2,858	3,021	2,354	2,198	1,411	1,335	770	747
Zone K	639	622	1,134	1,256	910	882	497	485	258	257
Total	**4,981**	**4,752**	**8,021**	**8,285**	**6,696**	**6,337**	**4,238**	**4,063**	**2,629**	**2,573**

Assessment of Fuel Constraint for Power Generation

- **"Gas supply constraints across the scenarios and fuel switching approaches . . . lead to thermal capacity that is unserved due to insufficient fuel availability. . . . Unserved capacity projections throughout this report reflect only unserved capacity related to fuel quantities available in the state. Generators that face supply limitations due to factors not considered in this analysis or not driven by the fuel quantities available are not captured in the results shown."** (Section 3.2.4)
  - Section 3.2.4 Table 36. Unserved Capacity (MW) by Winter Day in New York for 2025 and 2035 under Fuel Switch and Partial Fuel Switch Scenario

Scenario	2025 Fuel Switch Scenario	2025 Partial Fuel Switch Scenario	2035 Fuel Switch Scenario	2035 Partial Fuel Switch Scenario
Design Day	4,997	5,056	4,598	4,598
Jan '25 Winter	1,628	1,953	1,548	1,871
Bin 1	2,625	3,551	2,365	2,703
Bin 4	1,496	1,668	1,222	1,594
Bin 7	444	704	681	676

- **The study provides a zonal level assessment for gas supply and power sector demand balance under the Design Day conditions for the Bin 1 and Bin 4 scenarios.** (Section 3.2.4) **See additional details in the Appendix of this presentation.**
  - Section 3.2.4 Table 37. 2025 Coincident Peak Supply Design Day Gas Supply, Power Sector Demand, Supply/Demand Balance, and Unserved Capacity
  - Section 3.2.4 Table 38. 2025 Coincident Peak Bin 1 Gas Supply, Power Sector Demand, Supply/Demand Balance and Unserved Capacity
  - Section 3.2.4 Table 40. 2025 Coincident Peak Bin 4 Gas Supply, Power Sector Demand, Supply/Demand Balance and Unserved Capacity

Unserved Capacity	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F	Zone G	Zone H	Zone I	Zone J	Zone K	Total
Design Day	-	122	-	59	61	2,642	-	-	-	1,948	224*	5,056
Bin 1	-	-	-	59	61	2,642	-	-	-	401	388*	3,551
Bin 4	-	-	-	59	-	1,609	-	-	-	-	-	1,668

* Pending ICF Verification

Pipeline Expansion Scenario Assessment

- **"The pipeline expansion reduces the total unserved capacity by 534 MW in the Fuel Switch scenario and by 332 MW in the Partial Fuel Switch scenario on the Design Day. These reductions primarily occur in Zones F and Zone J, while Zone K remains unchanged because even with the expansion, gas supply is still insufficient to meet any demand there."** (Section 3.2.4)
  - Section 3.4.2 Table 43. 2035 Unserved Capacity With and Without Pipeline Expansion

	Fuel Switch Scenario		Partial Fuel Switch Scenario	
	No Pipeline Expansion	Pipeline Expansion	No Pipeline Expansion	Pipeline Expansion
Design Day	4,598	4,064	3,837	4,169
Bin 1	2,365	1,225	2,800	1,548
Bin 7	422	59	676	59

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Conclusions (Section 4)

- "Assumed natural gas supply is derived from Coincident and Non-Coincident maximum pipeline deliveries to utilities across the 11 major pipelines and utilities serving New York State and allocated to NYISO Load Zones based on delivery points"
- "Utility Design Day peak demand is projected to reach 8,285 MMcf/d by 2035, with growth in the most constrained areas of the state."
- "All scenarios result in unserved capacities due to limited supply into Zones F and D. Supply shortfalls and associated projections for unserved."
- "Scenarios with lower temperatures and therefore higher gas demand for non-power sector uses increase unserved capacity to over 5,000 MW under Design Day conditions."
- "Delayed retirements in the downstate areas would increase the Design Day unserved capacity relative to the Reference Scenario by ~400 MW, whereas proposed pipeline projects could all but eliminate some supply shortfalls in certain scenarios."
- "While Oil stocks and refueling capacities are sufficient to support backup fuel operations even on several design days in a row, which does however not factor in event-based limitations to fuel supply, or non-supply related limitations to fuel consumption such as permit limits or other operational factors."

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NYISO Management Response

- The NYISO management team would like to thank ICF for its efforts in producing the report titled, *2025 Study of Winter Fuel Constraints in New York State,* and stakeholders for their engagement in the development of this report
- In this report, ICF notes that its assessment focuses on the available gas only from the total supply perspective. ICF notes that the following factors that can further limit available fuel for power generators were not considered in its assessment:
  - Operational constraints that can exist under low temperature conditions such as operation flow orders issued by Local Distribution Companies
  - Event-based factors such as pipeline interruptions, fuel oil re-supply interruptions, and other supply-related limitations that may arise from low temperatures
  - Operational aspects that may impact facilities' ability to dispatch beyond fuel availability such as environment permit limitations, position in the dispatch order, or potential contributions to reserve markets
- Given these limitations, ICF recommends viewing its report as a starting point for the NYISO's fuel availability assumptions in a winter reliability assessment.
- The NYISO management team agrees that the report serves as a starting point for the NYISO's fuel availability assumptions in consideration for winter reliability.

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Next Steps

Next Steps

- The NYISO plans to return to the 3/31/2026 ICS meeting to discuss how the ICF Study can be considered for winter fuel constraint assumptions in the IRM model

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Our Mission and 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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