NEPOOL PARTICIPANTS COMMITTEE | 2/1/24
Meeting Agenda item #5

NEPOOL Participants Committee Report

February 2024

Vamsi Chadalavada

EXECUTIVE VICE PRESIDENT AND CHIEF OPERATING OFFICER

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Regular Operations Report - Highlights

Highlights: January 2024

Data is through January 24 unless otherwise noted

- **Peak Hour** on January 17
  - 18,431 MW Revenue Quality Metered (RQM) system peak; hour ending 6:00 pm
- **Average Pricing**
  - Day Ahead (DA) Hub Locational Marginal Price (LMP): $76.84/MWh
  - Real Time (RT) Hub LMP: $68.91/MWh
  - Natural Gas: $8.83/Mmbtu (MA Natual Gas Avg)
- **Energy Market** value $712M up from $552M in January 2023
  - Ancillary Markets* value $6.6M unchanged from January 2023
  - Average DA cleared physical energy during the peak hours as percent of forecasted load was 102.1% during January, down from 102.4% during December*
    - The minimum value for the month was 98.1% on Monday, January 1st
- **Net Commitment Period Compensation (NCPC)** total $2.4M
  - First Contingency $2.3M, down $2.4M from December, 2023
  - Second Contingency and Voltage payments were both zero
  - Distribution $52K
- **Forward Capacity Market (FCM)** market value $86.3M
  - FCM peak for 2024 remains 17,993 MWh; hour ending 6:00 P.M. on Wednesday, January 17

*Ancillaries = Reserves, Regulation, NCPC, less Marginal Loss Revenue Fund (MLRF)

**DA Cleared Physical Energy is the sum of Generation and Net Imports cleared in the DA Energy Market

Underlying natural gas data furnished by:

ICE Global markets in clear view

Highlights

- 2024 Economic Study was initiated in January
  - Starting the implementation of Tariff improvements related to the Economic Study Process made in 2023
- Forward Capacity Auction #18 will commence on February 5
- The next LFC meeting will be held on February 23
- The lowest 50/50 and 90/10 Winter Operable Capacity Margins are projected for week beginning January 13, 2024

Forward Capacity Market (FCM) Highlights

- CCP 15 (2024-2025)
  - The ISO will hold the third annual reconfiguration auction (ARA3) over March 1-5, 2024, and will post the results no later than April 3, 2024
- CCP 16 (2025-2026)
  - The ISO will hold the second annual reconfiguration auction (ARA2) over August 1-5, 2024, and will post the results no later than September 3, 2024
- CCP 17 (2026-2027)
  - The ISO will hold the first annual reconfiguration auction (ARA1) over June 3-5, 2024, and will post the results no later than July 5, 2024

CCP – Capacity Commitment Period

FCM Highlights, cont.

- CCP 18 (2027-2028)
  - FCA 18 will model the following zones:
    - Export-constrained zones: Northern New England and Maine nested inside Northern New England
    - Rest-of-Pool
  - ICR and related values were approved at the September 19, 2023 RC and October 5, 2023 PC meetings, filed with FERC on November 7, 2023, and FERC issued an order accepting the results effective January 6, 2024
  - The ISO submitted the FCA 18 informational filing to FERC on November 22, 2023, and errata filing on January 10, 2024
  - The FCA will commence on February 5, 2024
- CCP 19 (2028-2029)
  - The ISO filed market rule changes to delay FCA 19 for one year with FERC on November 3, 2023; FERC issued an order accepting the delay to FCA 19 on January 2, 2024
  - The ISO will commence the interim reconfiguration auction qualification process resulting from the FCA 19 delay in April 2024

SYSTEM OPERATIONS

System Operations

Weather Patterns	Boston	Temperature: Above Normal (3.3°F) Max: 60°F, Min: 14°F Precipitation: 7.55" – Above Normal Normal: 3.08" Snow: 8.70"	Hartford	Temperature: Above Normal (4.2°F) Max: 55°F, Min: 6°F Precipitation: 8.34" – Above Normal Normal: 2.98" Snow: 15.50"

Peak Load:	18,299 MW	January 17, 2024	19:00 (ending)

Emergency Procedure Events (OP-4, M/LCC 2, Minimum Generation Emergency)

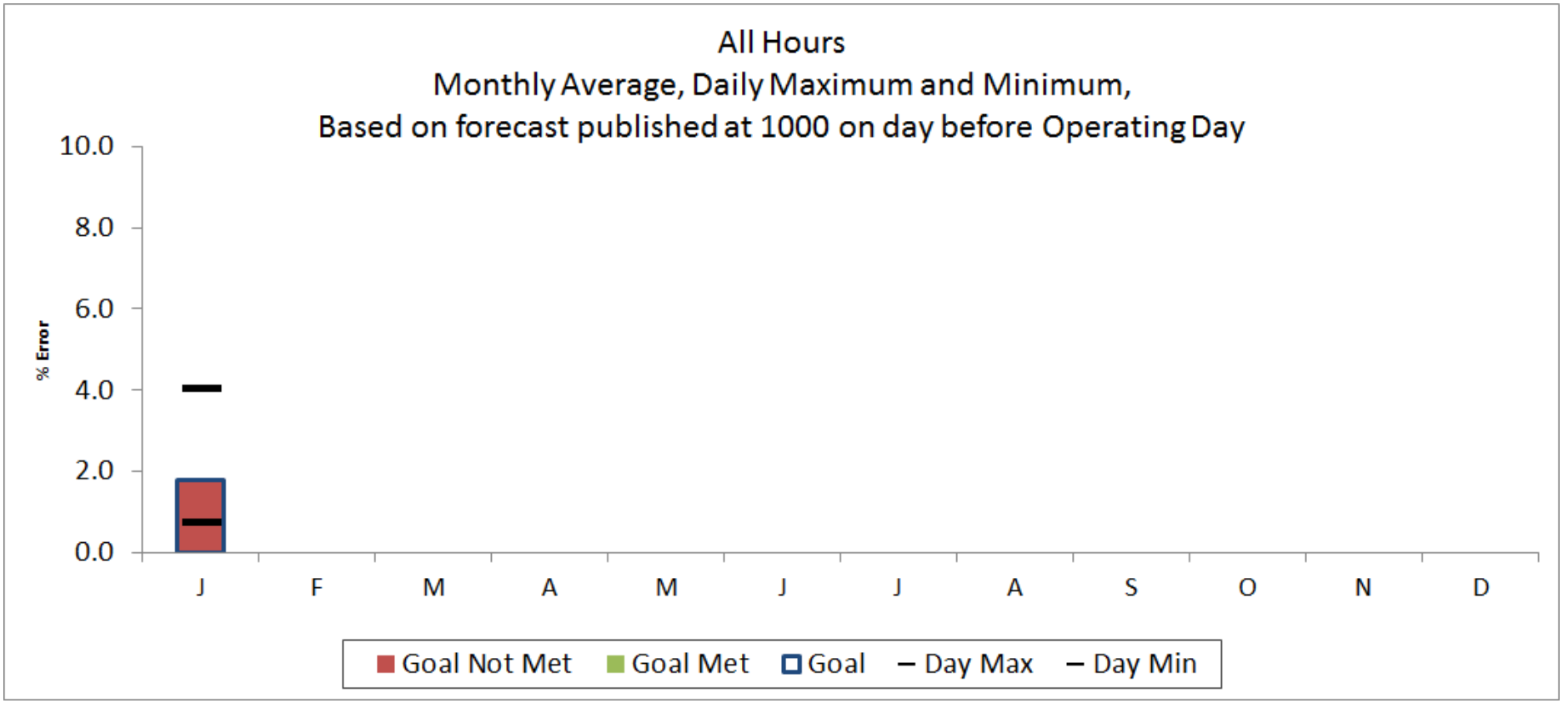
Procedure	Declared	Cancelled	Note
NONE			

System Operations

NPCC Simultaneous Activation of Reserve Events

Date	Area	MW Lost
01/02/2024	ISO-NE	600

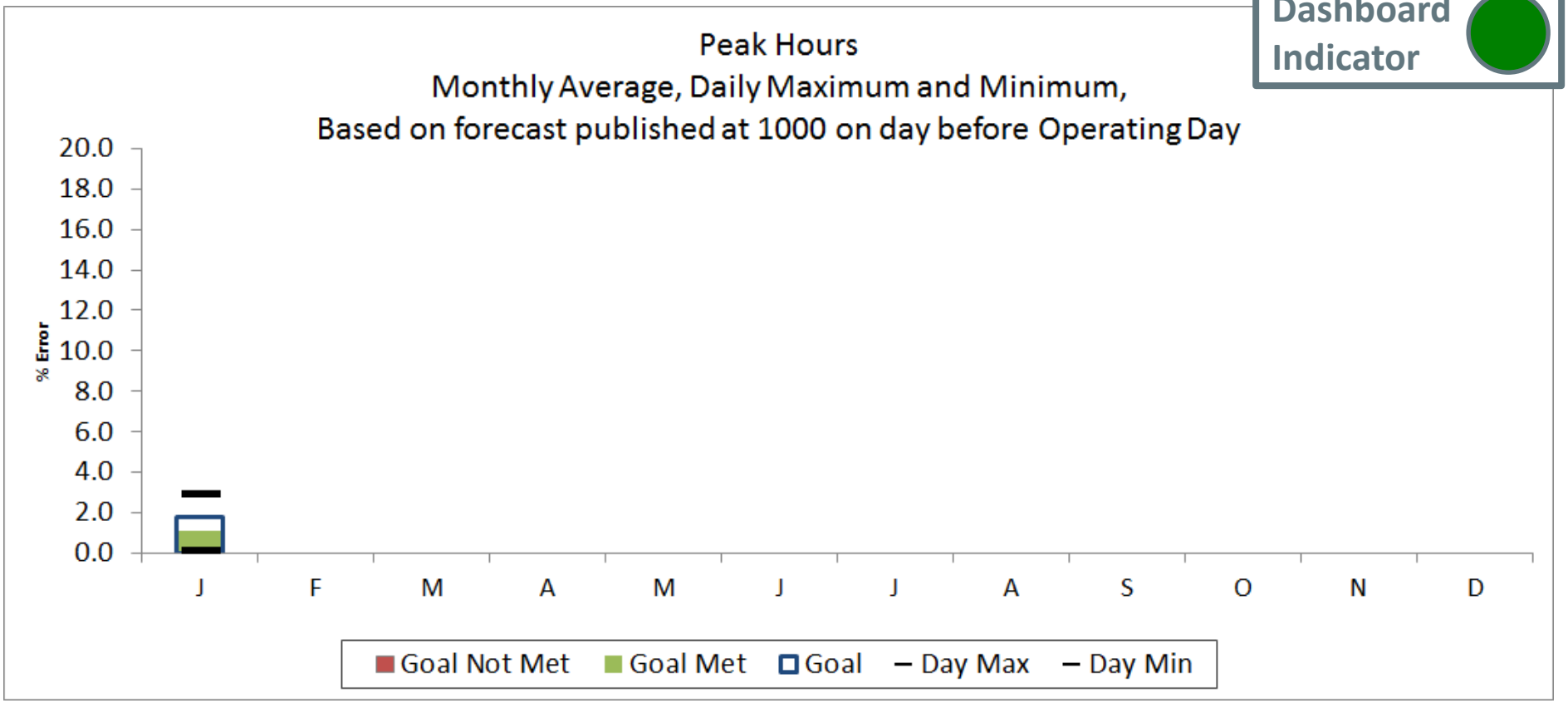
2024 System Operations - Load Forecast Accuracy



Month	J	F	M	A	M	J	J	A	S	O	N	D	
Day Max	4.03												4.03
Day Min	0.73												0.73
MAPE	1.86												1.86
Goal	1.80												

2024 System Operations - Load Forecast Accuracy cont.

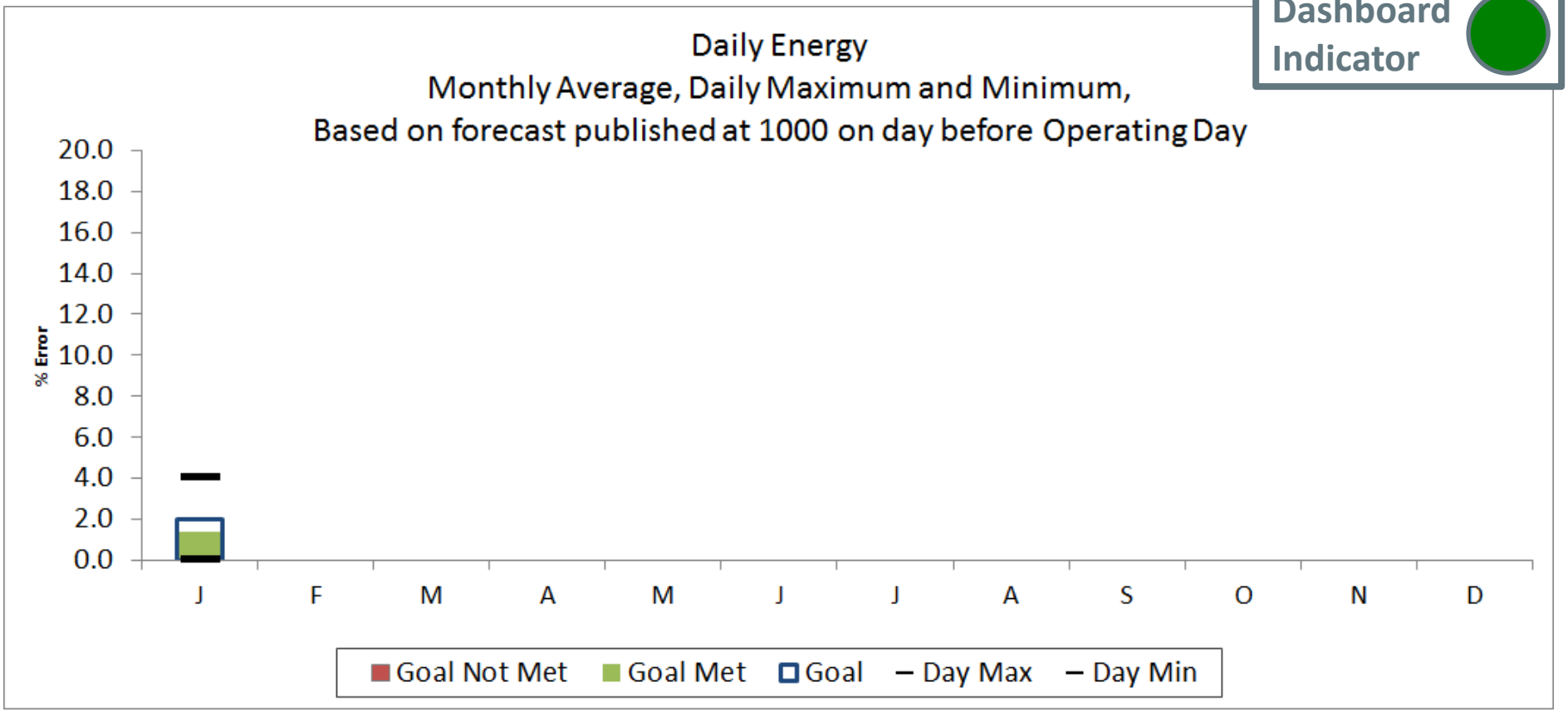
Dashboard Indicator



Month	J	F	M	A	M	J	J	A	S	O	N	D	
Day Max	2.90												2.90
Day Min	0.08												0.08
MAPE	1.13												1.13
Goal	1.80												

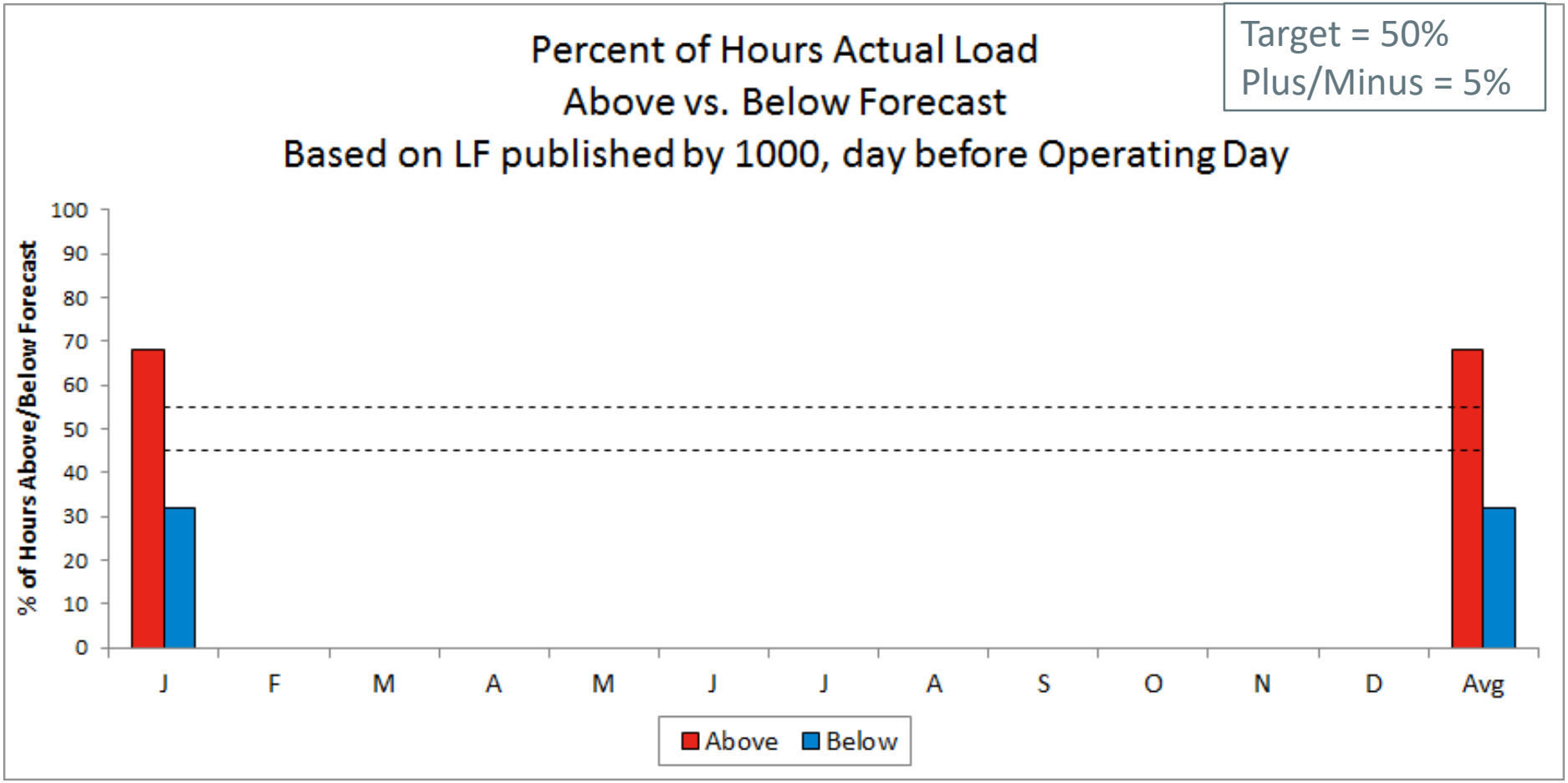
2024 System Operations - Load Forecast Accuracy cont.

Dashboard Indicator



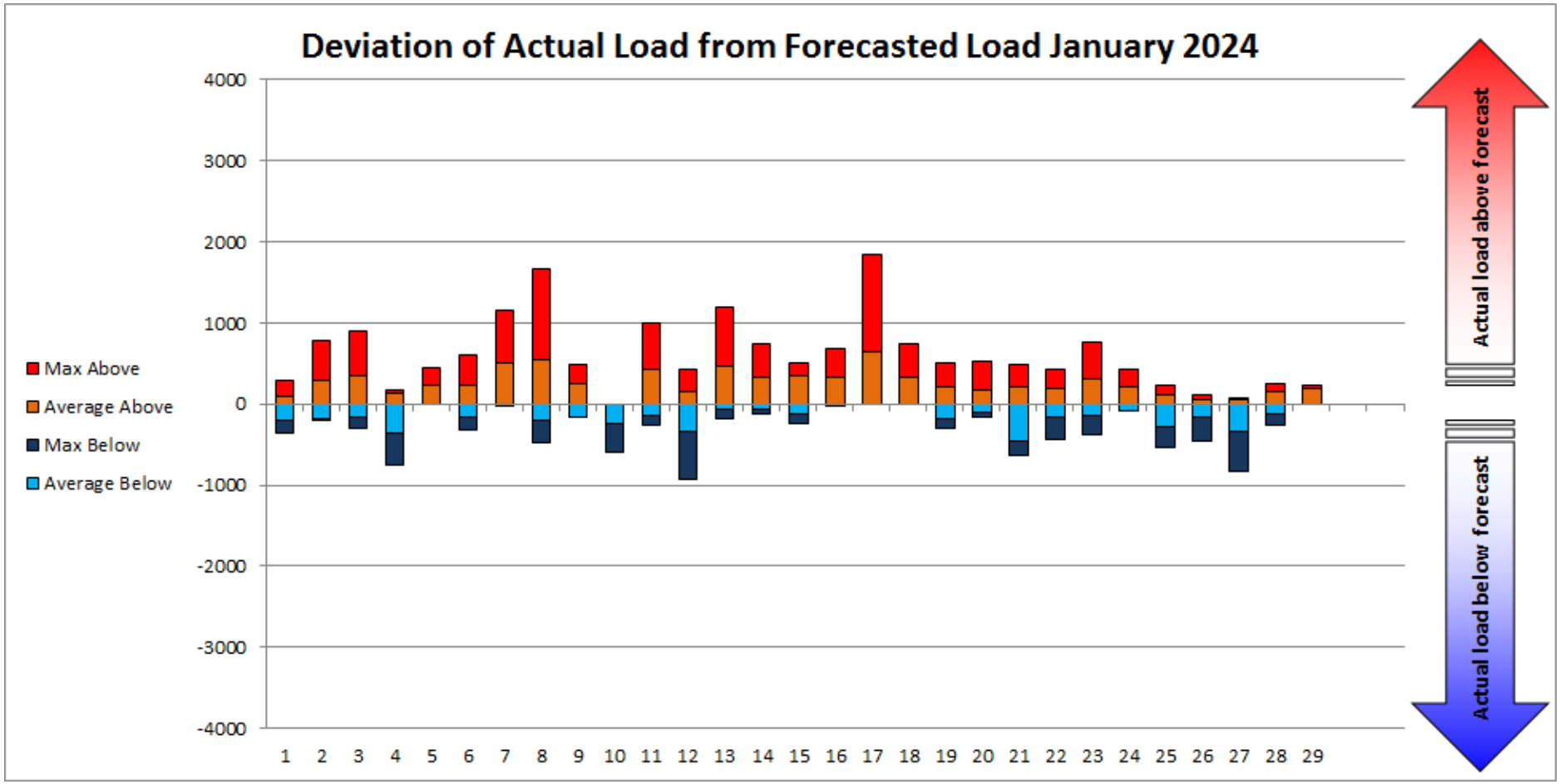
Month	J	F	M	A	M	J	J	A	S	O	N	D	
Day Max	4.02												4.02
Day Min	0.02												0.02
MAPE	1.43												1.43
Goal	2.00												

2024 System Operations - Load Forecast Accuracy cont.



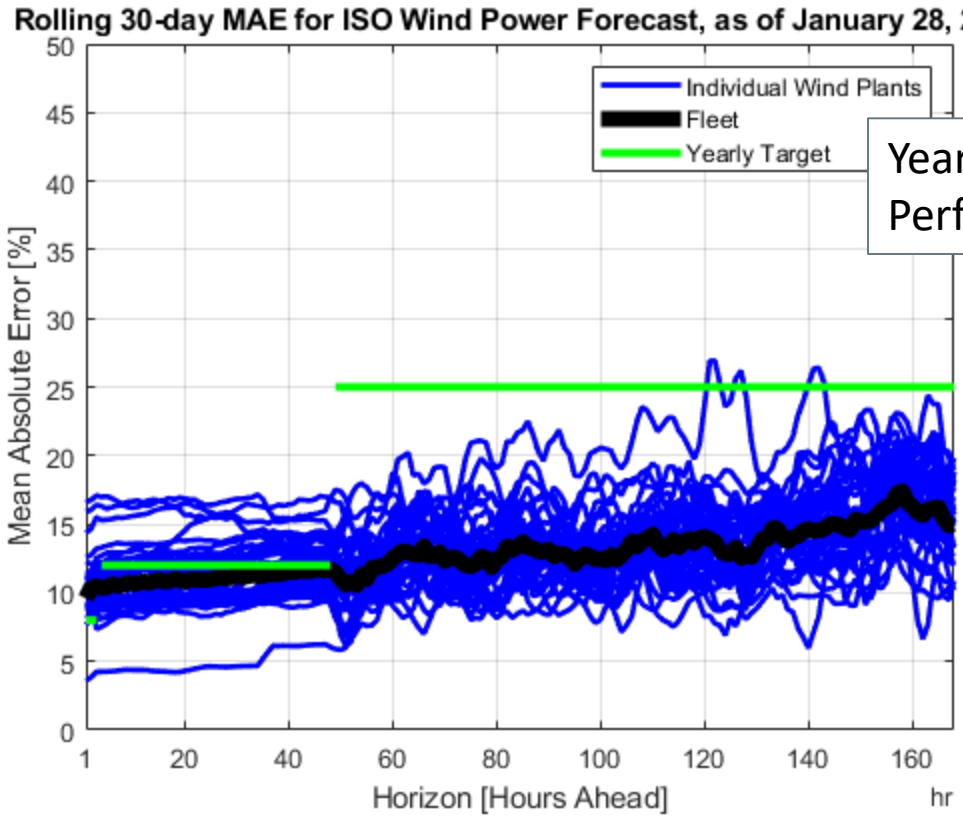
	J	F	M	A	M	J	J	A	S	O	N	D	Avg
Above %	68.1												68
Below %	31.9												32
Avg Above	240.9												241
Avg Below	-144.5												-145
Avg All	132												132

2024 System Operations - Load Forecast Accuracy cont.



Wind Power Forecast Error Statistics: Medium and Long Term Forecasts MAE

Dashboard Indicator

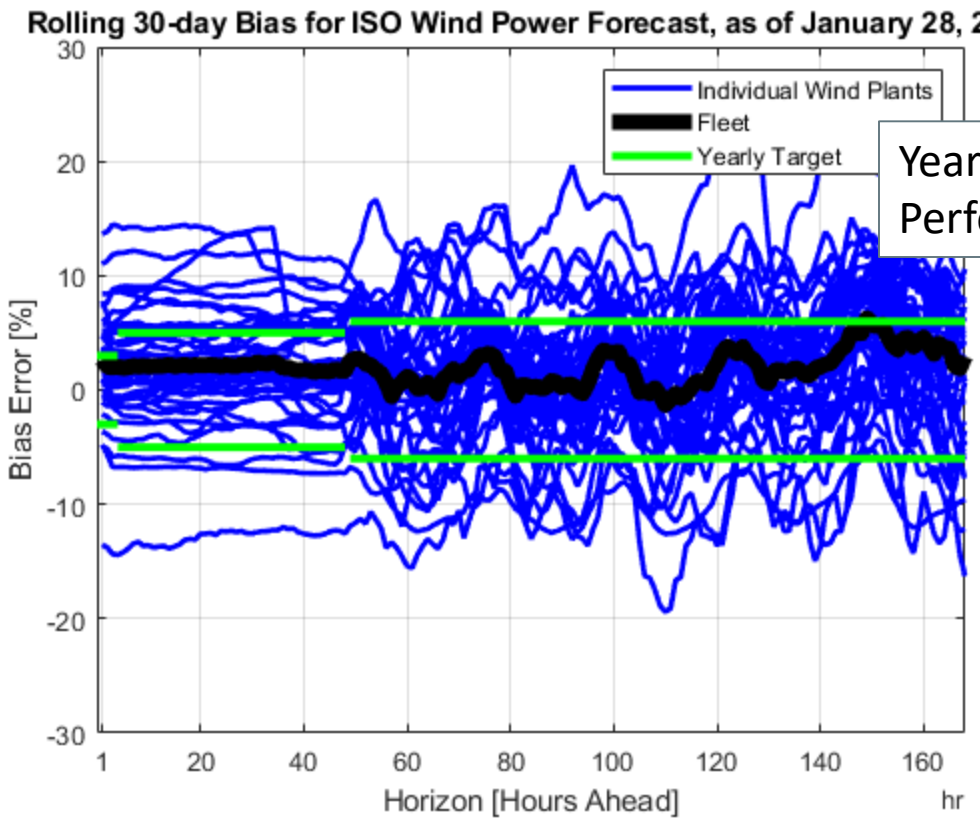


Yearly Fleet Performance targets

Ideally, MAE and Bias would be both equal to zero. As is typical, MAE increases with the forecast horizon. MAE and Bias for the fleet of wind power resources are less due to offsetting errors. Across all time frames, the ISO-NE/DNV forecast is very good compared to industry standards. Monthly MAE is outside of yearly performance targets for 1 hour look-ahead.

Wind Power Forecast Error Statistics: Medium and Long Term Forecasts Bias

Dashboard Indicator

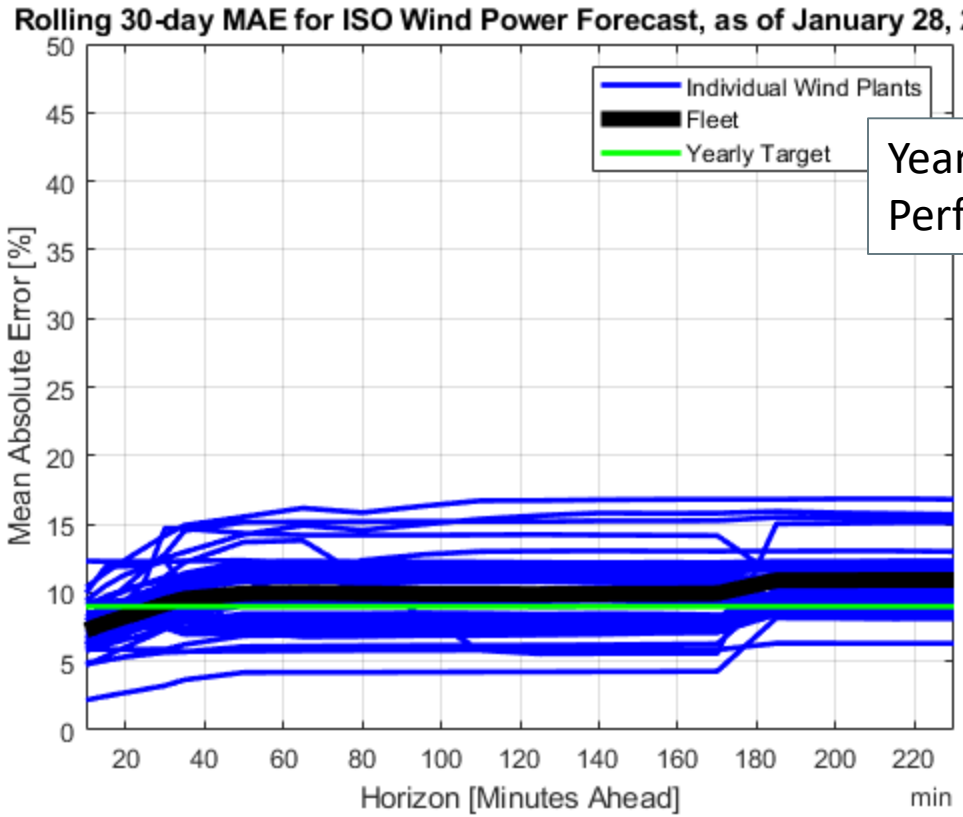


Yearly Fleet Performance targets

Ideally, MAE and Bias would be both equal to zero. Positive bias means less windpower was actually available compared to forecast. Negative bias means more windpower was actually available compared to forecast. Across all time frames, the ISO-NE/DNV forecast compares well with industry standards, and monthly Bias is within yearly performance targets except for the 150 hour look-ahead timeframe.

Wind Power Forecast Error Statistics: Short Term Forecast MAE

Dashboard Indicator

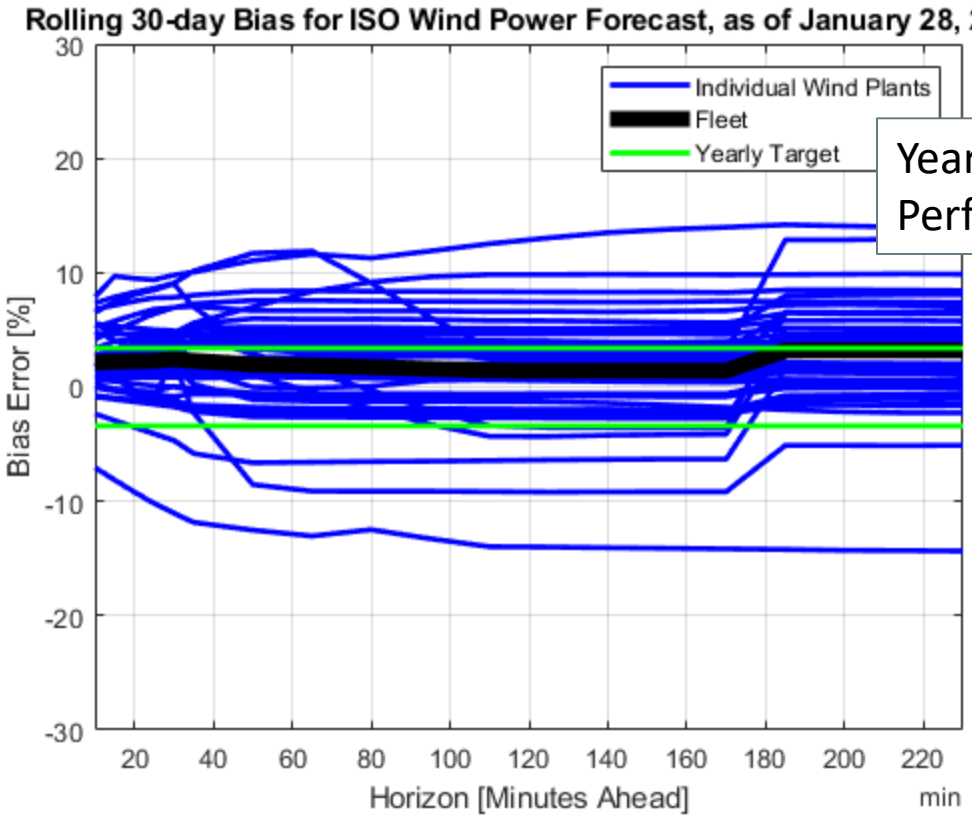


Yearly Fleet Performance targets

Ideally, MAE and Bias would be both equal to zero. As is typical, MAE increases with the forecast horizon. MAE and Bias for the fleet of wind power resources are less due to offsetting errors. Across all time frames, the forecast compares well with industry standards, but monthly MAE is outside of yearly performance targets at greater than 30 minutes look-ahead.

Wind Power Forecast Error Statistics: Short Term Forecast Bias

Dashboard Indicator



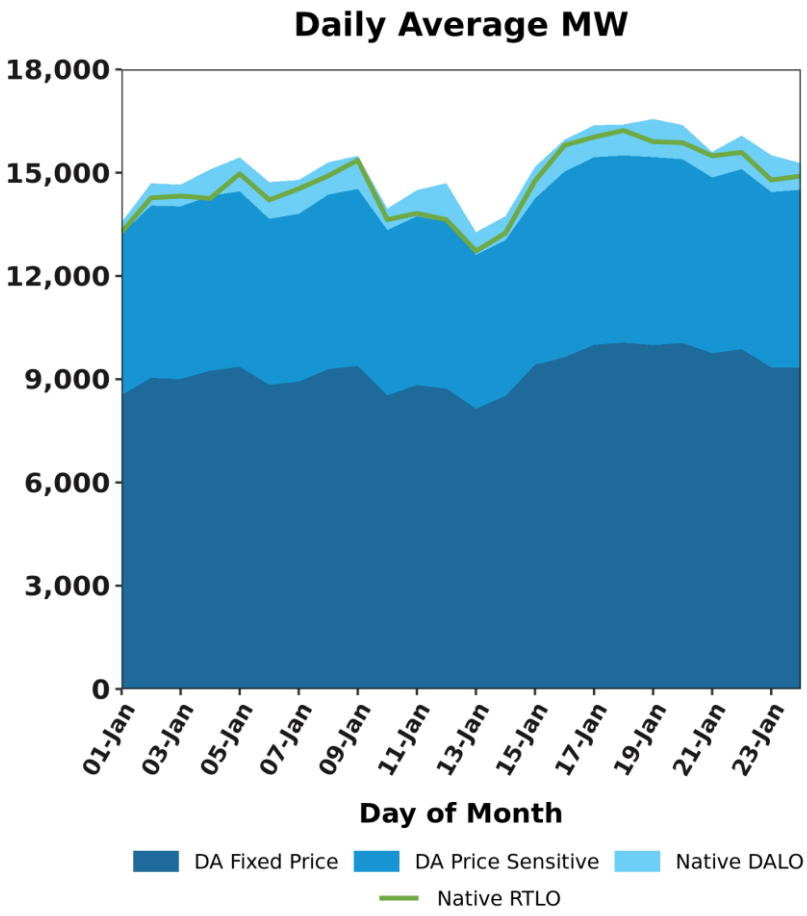
Yearly Fleet Performance targets

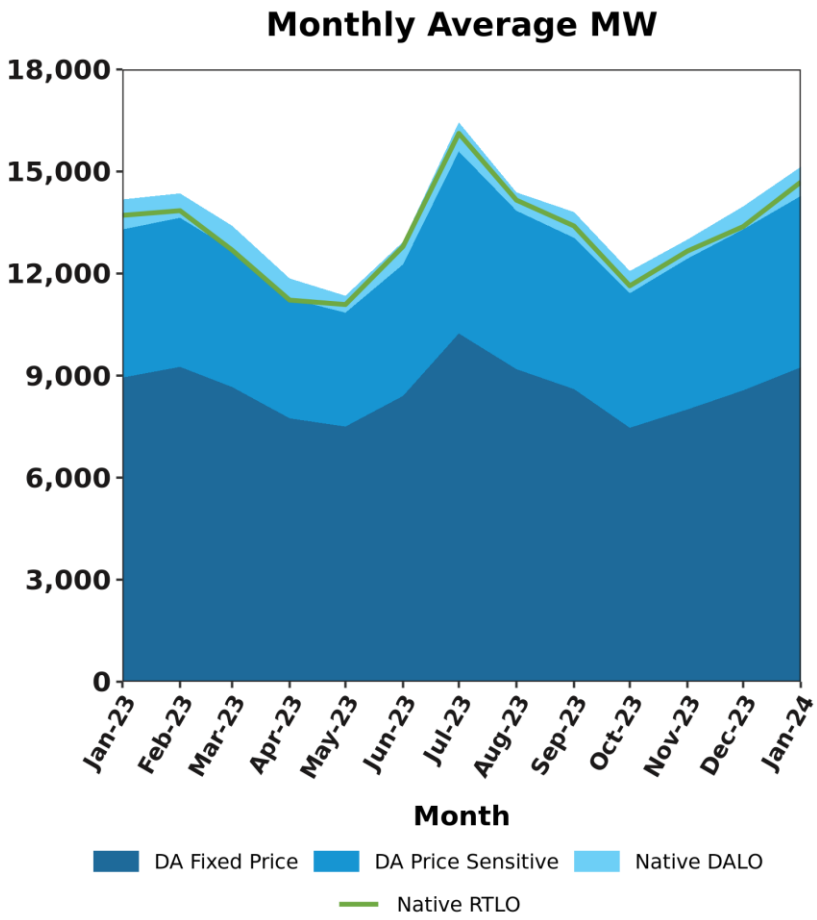
Ideally, MAE and Bias would be both equal to zero. Positive bias means less windpower was actually available compared to forecast. Negative bias means more windpower was actually available compared to forecast. Across all time frames, the ISO-NE/DNV forecast compares well with industry standards, and monthly Bias is within yearly performance.

MARKET OPERATIONS

SUPPLY AND DEMAND VOLUMES

DA Cleared Native Load by Composition Compared to Native RT Load

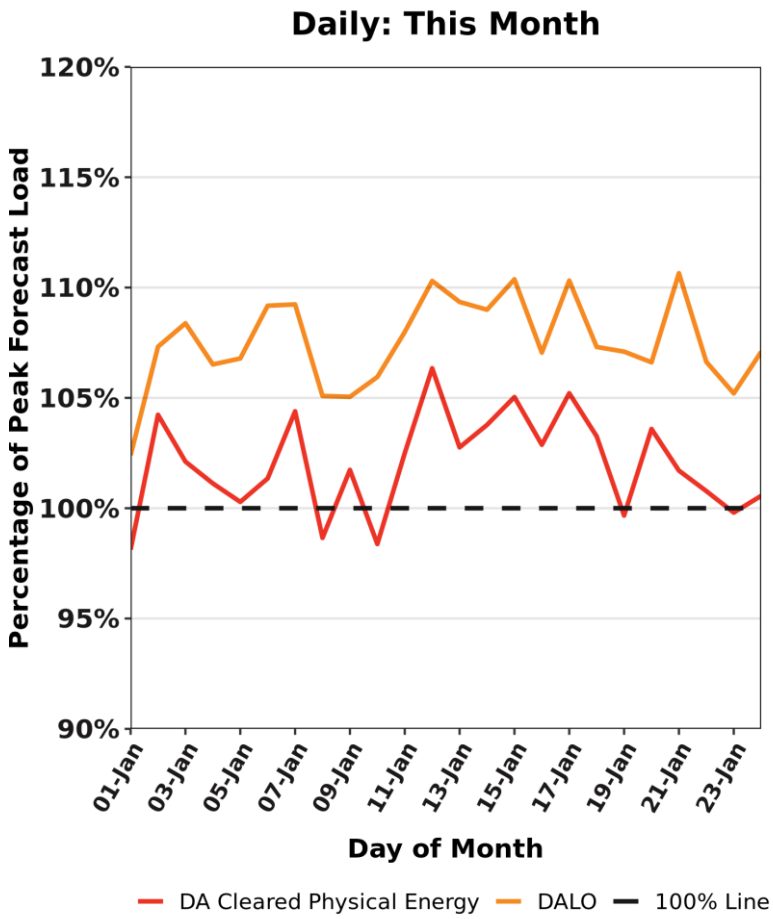


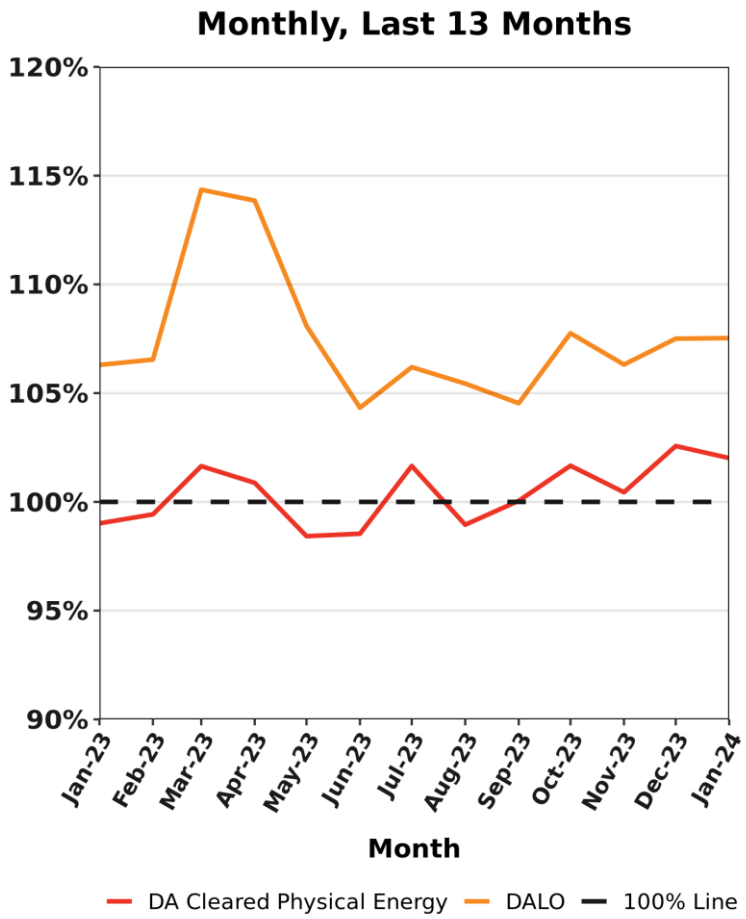


Native Day-Ahead Load Obligation (DALO) is the sum of all day-ahead cleared load, excluding modeled transmission losses and exports

Native Real-Time Load Obligation (RTLO) is the sum of all real-time load, excluding modeled transmission losses and exports

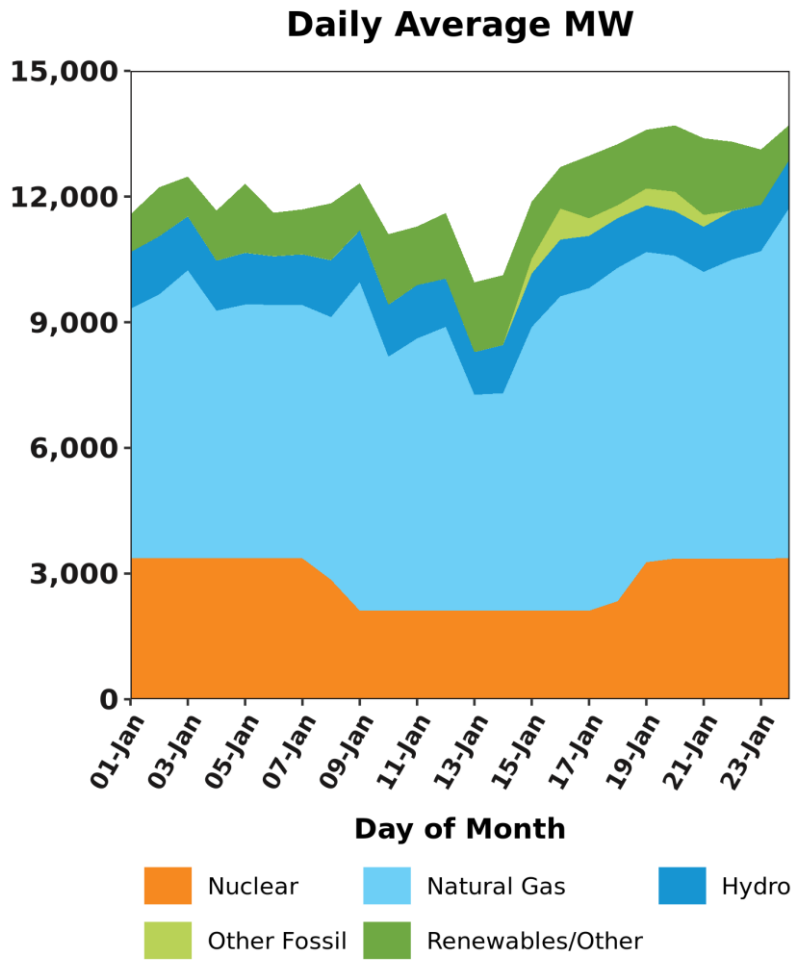
DA Volumes as % of Forecast in Peak Hour

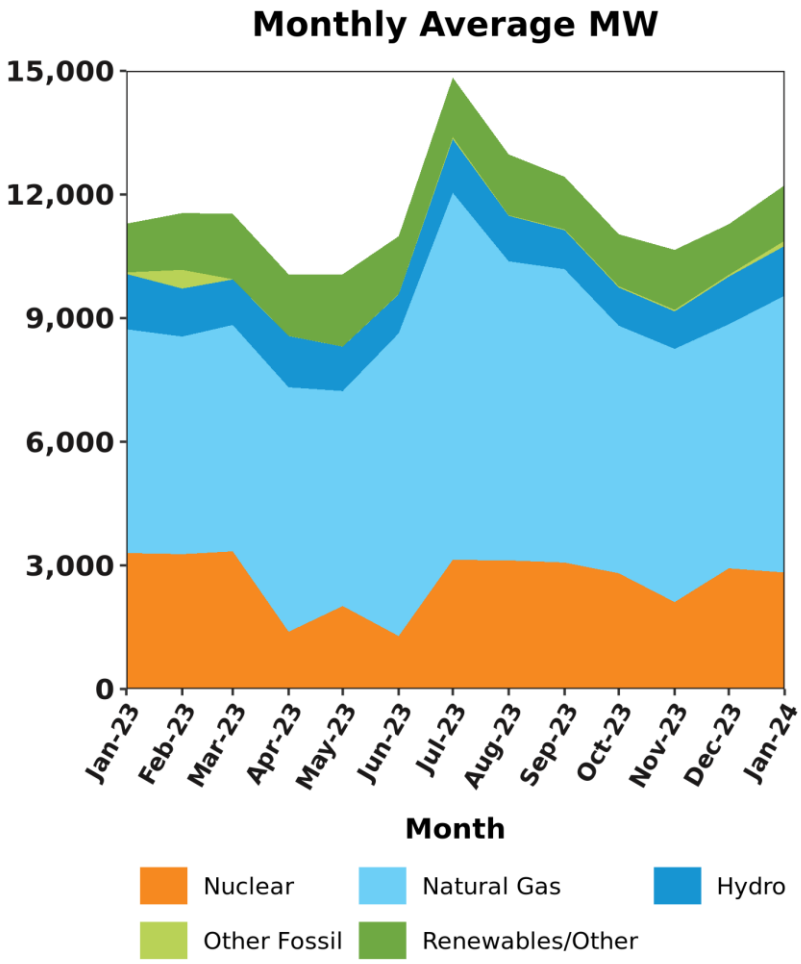




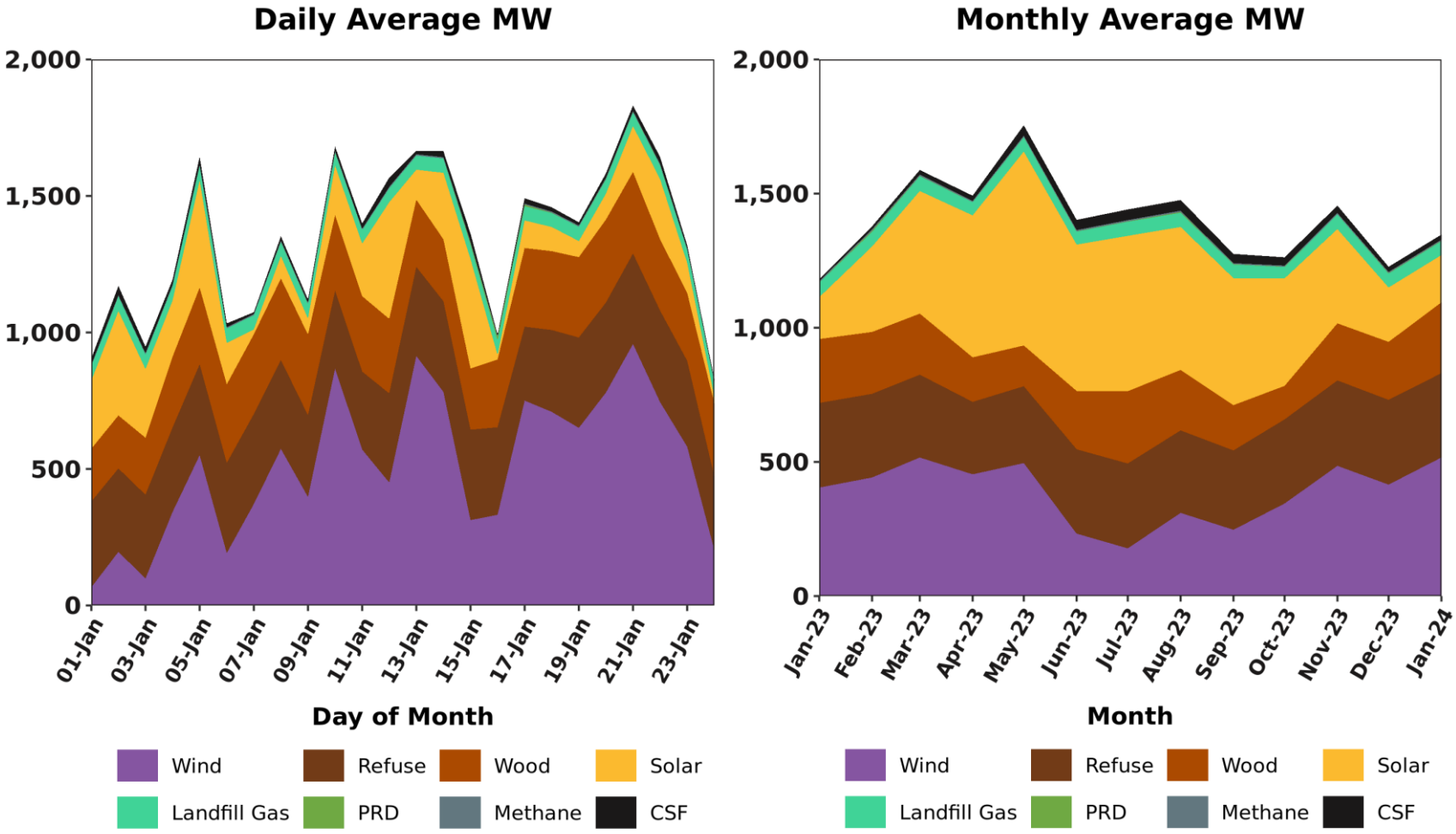
The number of system-level manual supplemental commitments for capacity required during the Reserve Adequacy Assessment (RAA) period during the month was: none

Generation by Fuel Type



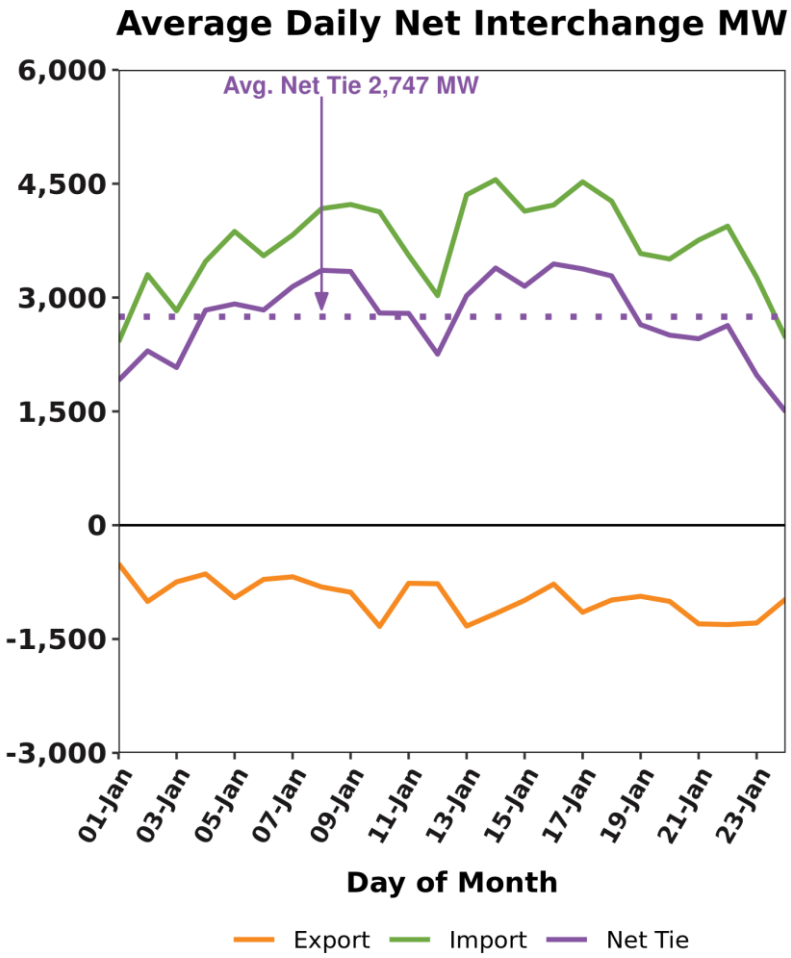


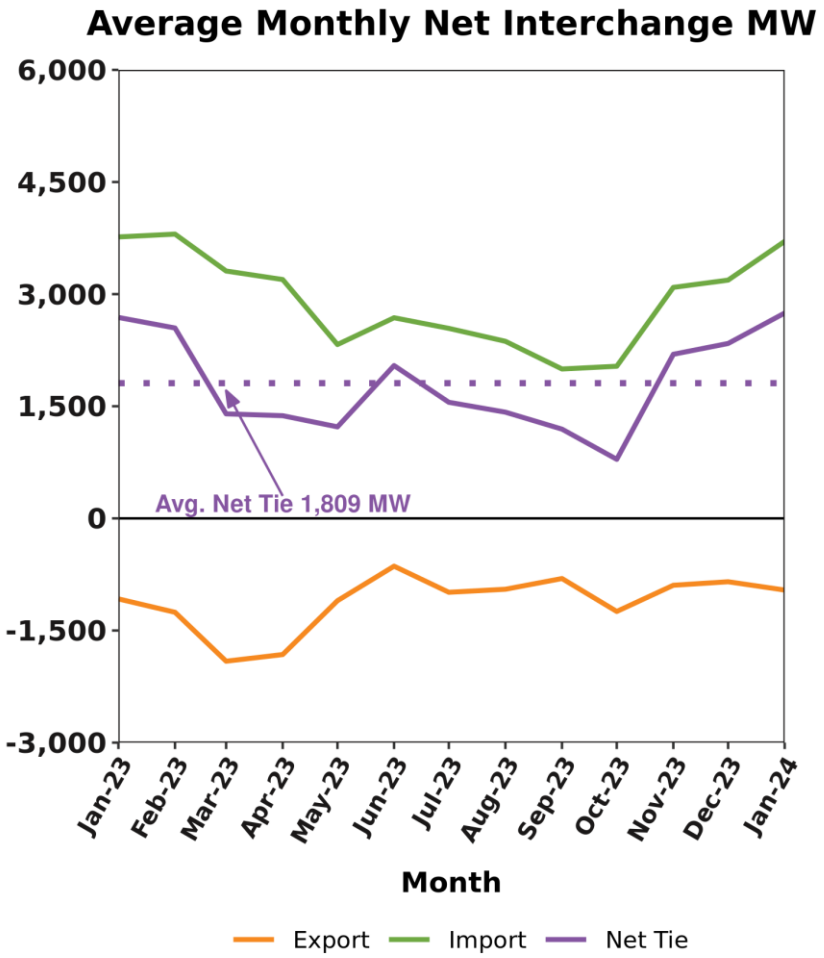
Renewable Generation by Fuel Type



CSF represents Continuous Storage Facilities (a.k.a. Batteries)

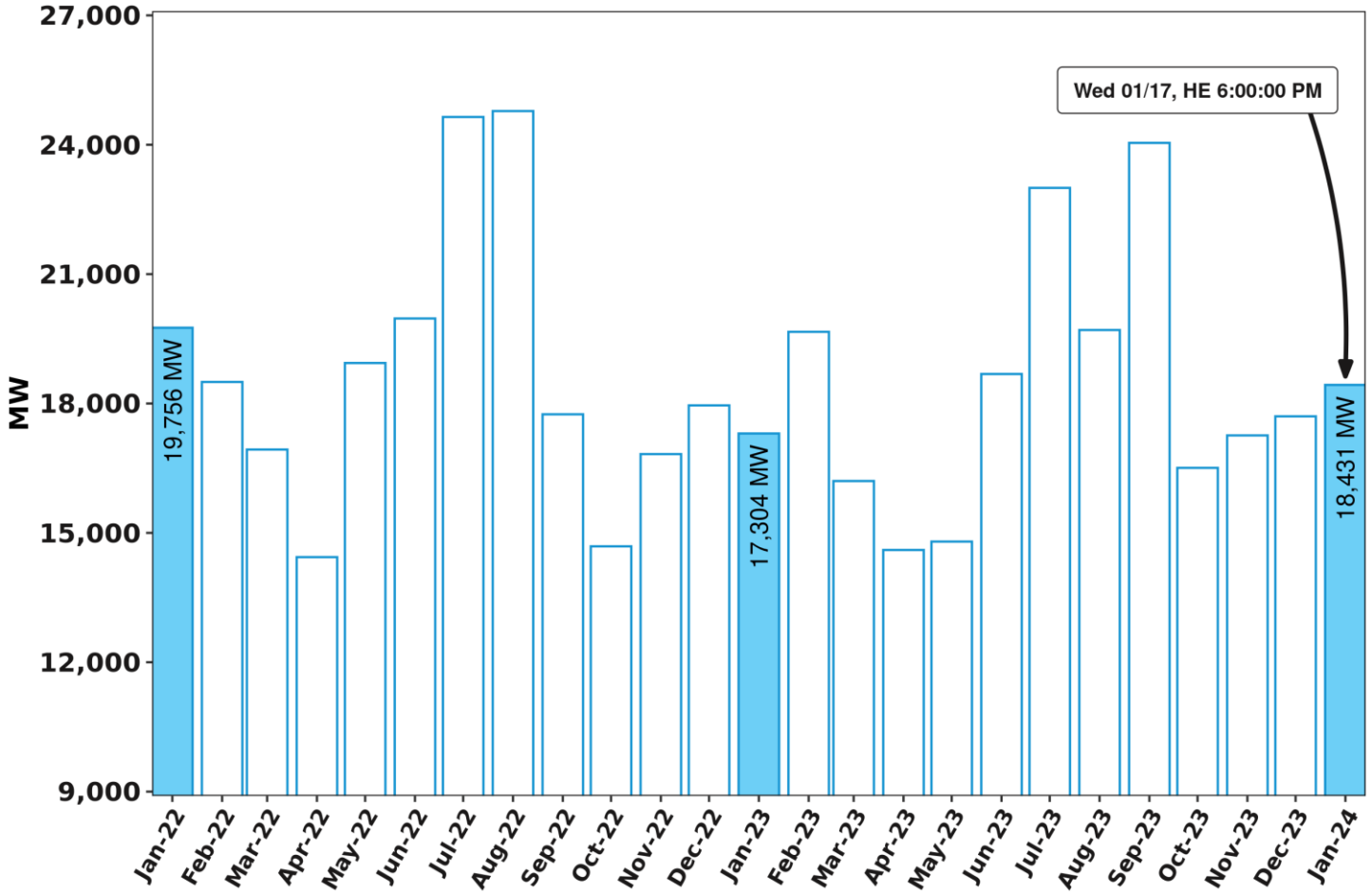
DA vs. RT Net Interchange





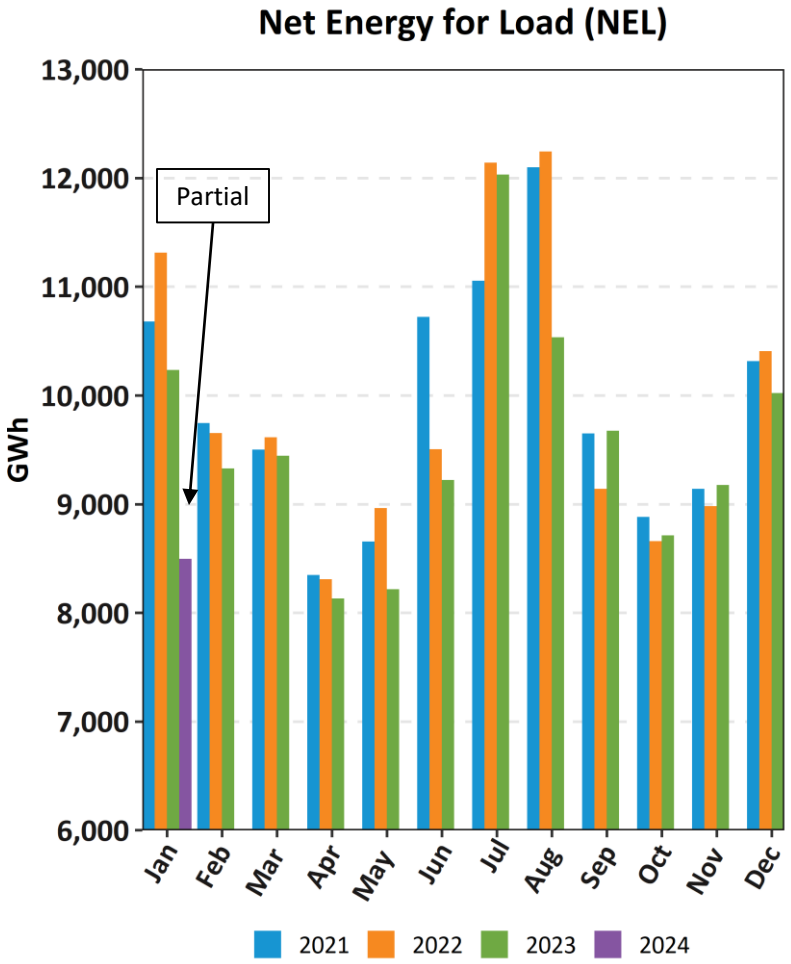
Net Interchange is the participant sum of daily imports minus the sum of daily exports; positive values are net imports

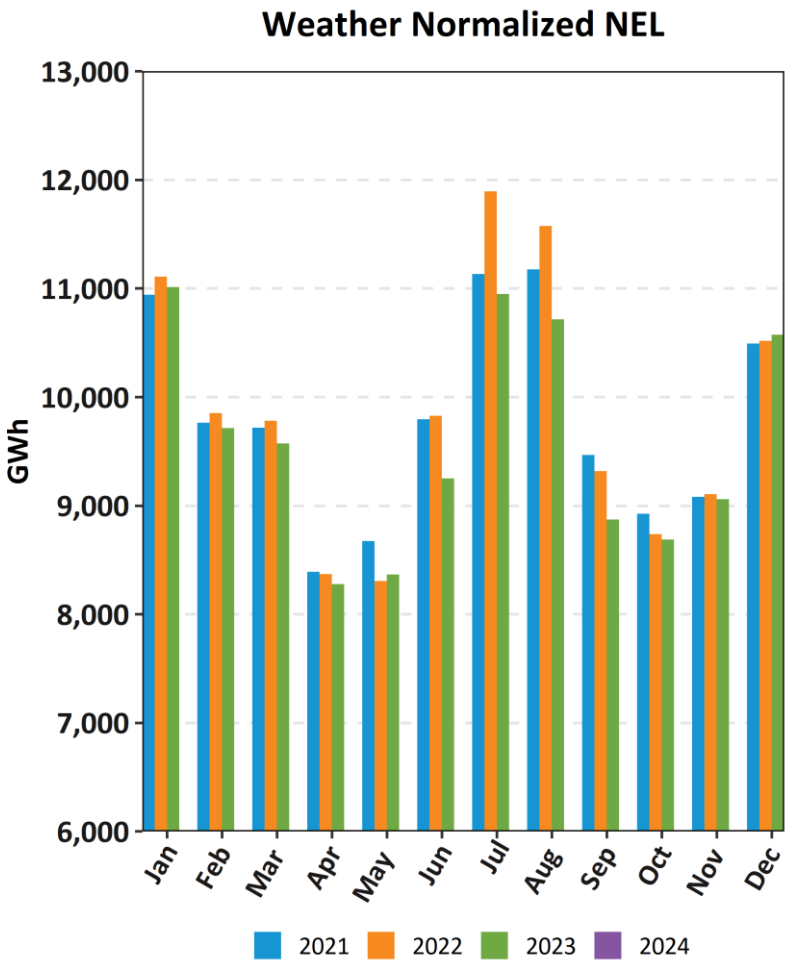
Monthly Revenue Quality Metered (RQM) Peak Load MW by Month



Shaded columns reflect RQM Peak for the current month and the same month the last 2 years

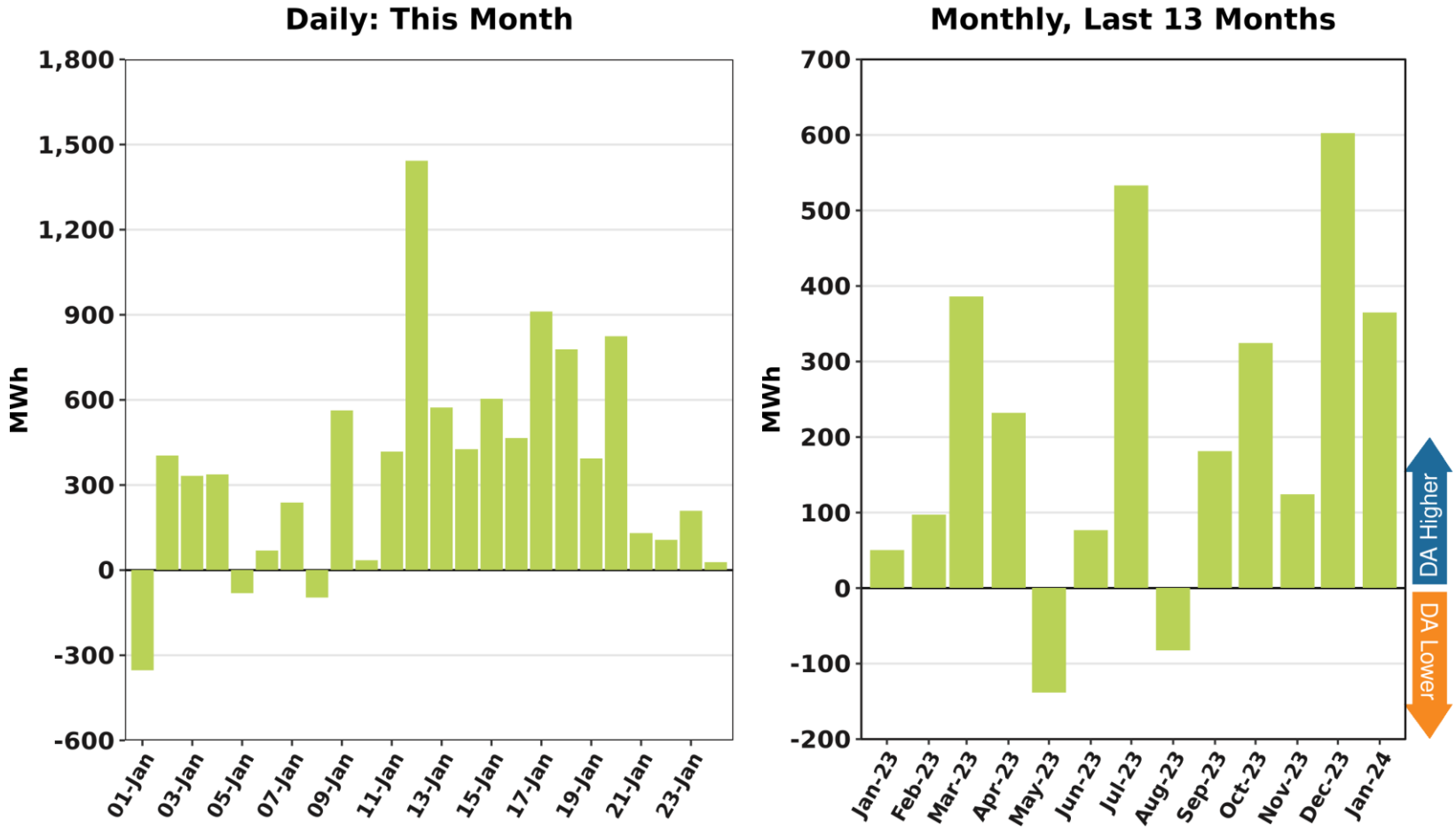
Monthly Recorded Net Energy for Load (NEL) and Weather Normalized NEL





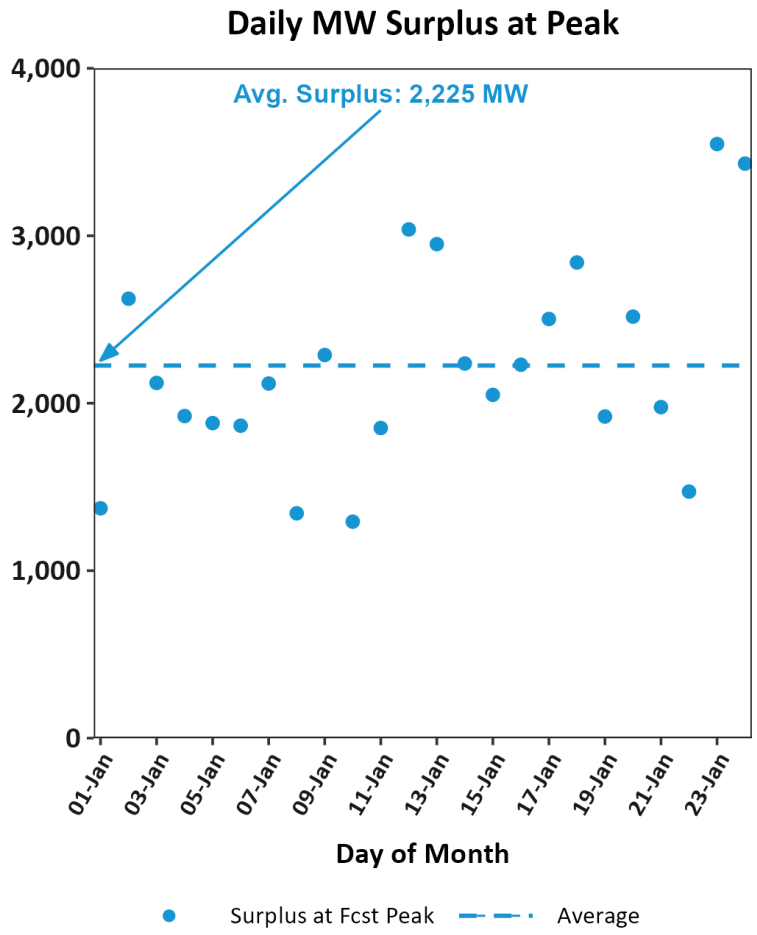
NEPOOL NEL is the total net revenue quality metered energy required to serve load and is analogous to 'RT system load.' NEL is calculated as: Generation - pumping load + net interchange where imports are positively signed. Current month's data may be preliminary. Weather normalized NEL is typically reported on a one-month lag.

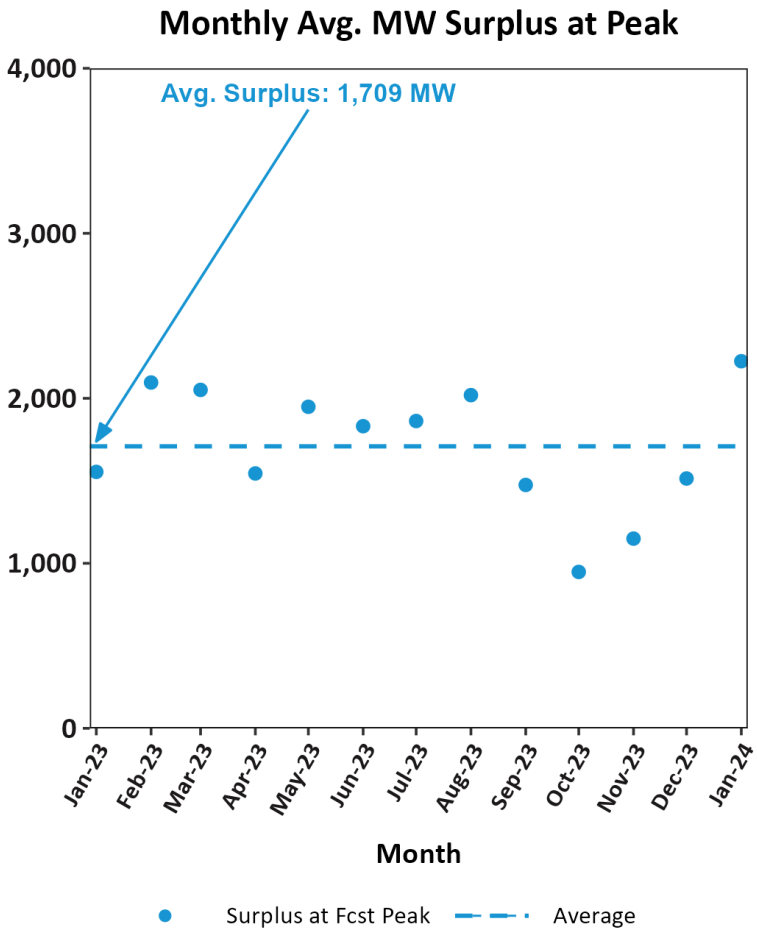
DA Cleared Physical Energy Difference from RT System Load at Forecasted Peak Hour



Negative values indicate DA Cleared Physical Energy value below its RT counterpart. Forecast peak hour reflected.

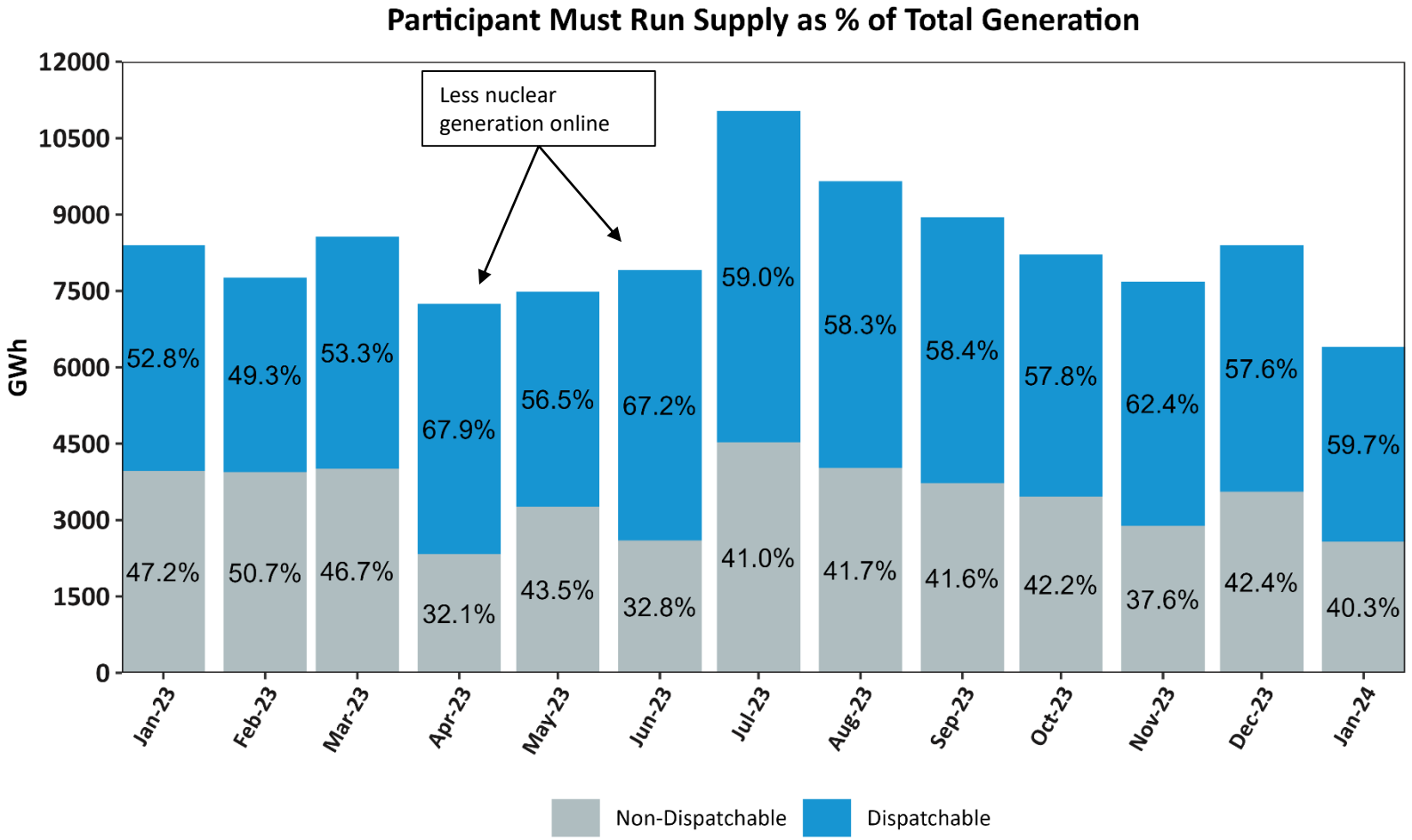
Maximum Supply* Cleared in the DA Market Continues to Meet Forecasted Peak-Hour Requirements





*MWs above are made up of ECO max for cleared assets + offered reserves for non-cleared assets for the forecasted peak hour

RT Generation Output Offered as Must Run vs. Dispatchable



Includes generation and DRR. Must Run (non-dispatchable) category reflects full output of settlement-only generation (SOG) as well as must run offers from modeled units

MARKET PRICING

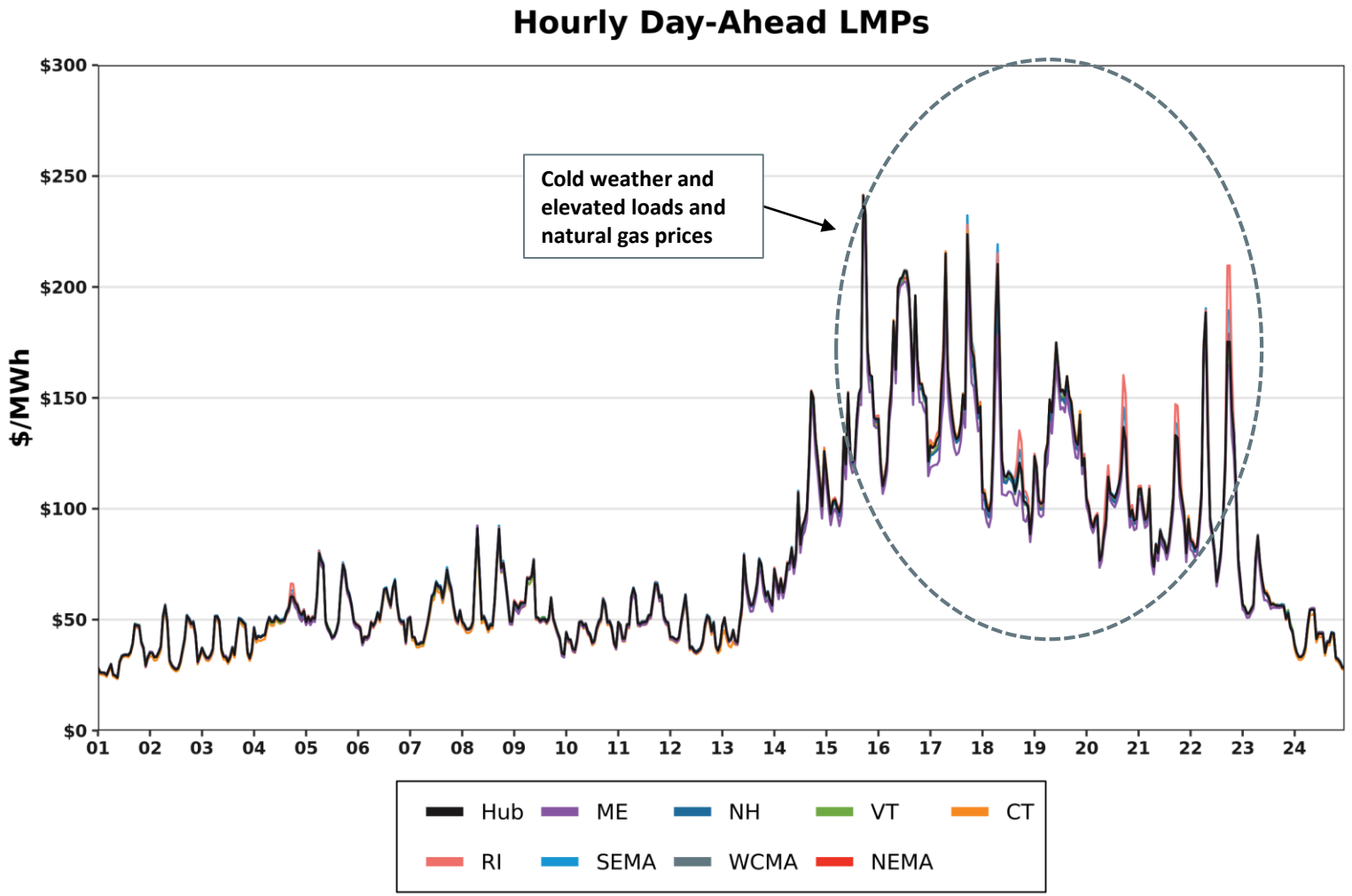
DA vs. RT LMPs ($/MWh)

Arithmetic Average

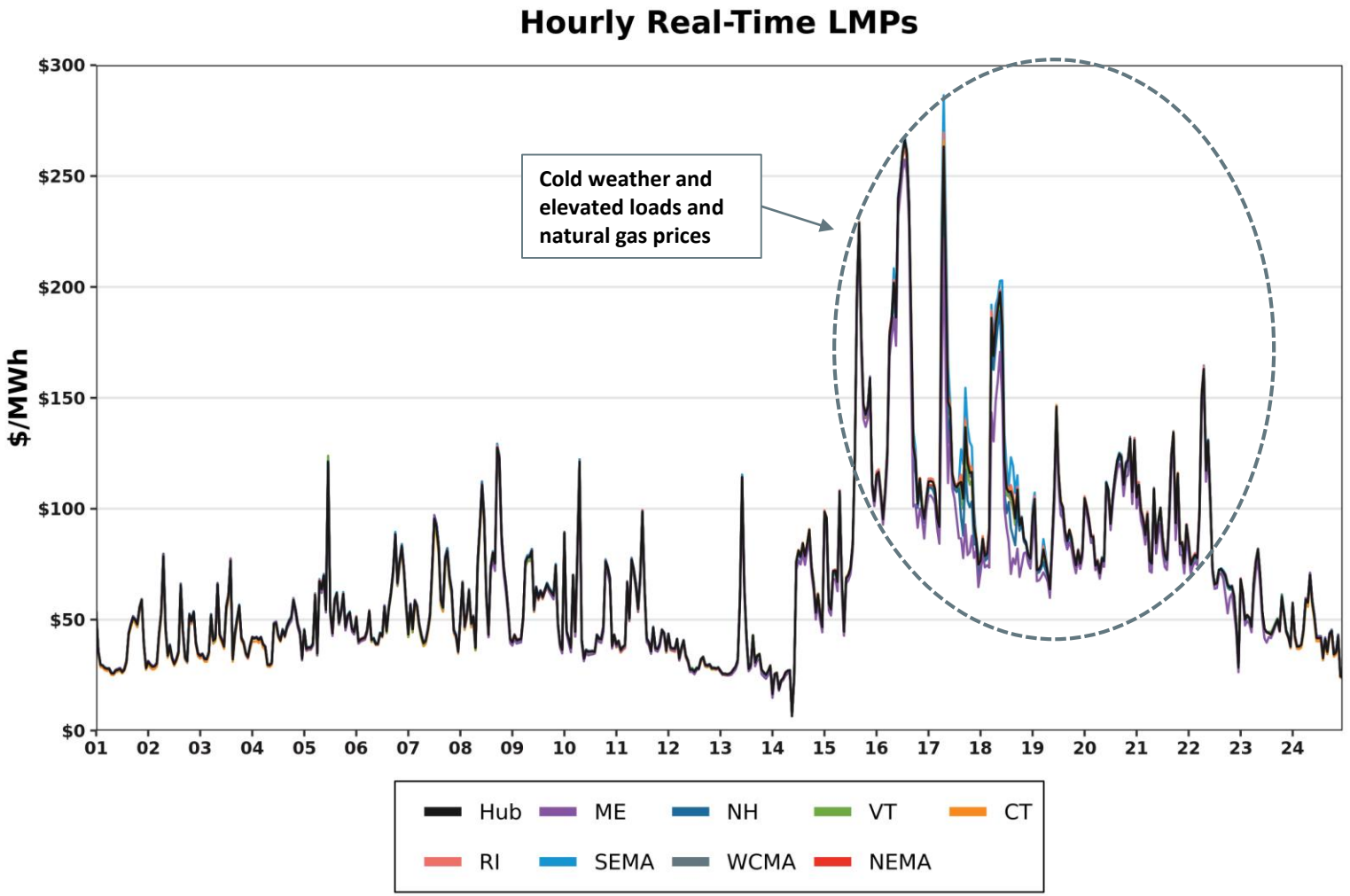
Year 2022	NEMA	CT	ME	NH	VT	RI	SEMA	WCMA	Hub
Day-Ahead	$86.07	$84.05	$84.15	$85.73	$84.46	$85.35	$86.01	$85.66	$85.55
Real-Time	$85.42	$83.83	$83.06	$85.07	$83.67	$84.71	$85.37	$85.00	$84.92
RT Delta %	-0.8%	-0.3%	-1.3%	-0.8%	-0.9%	-0.7%	-0.7%	-0.8%	-0.7%
Year 2023	**NEMA**	**CT**	**ME**	**NH**	**VT**	**RI**	**SEMA**	**WCMA**	**Hub**
Day-Ahead	$37.12	$36.04	$36.37	$37.00	$36.56	$36.67	$37.12	$36.85	$36.82
Real-Time	$36.00	$35.06	$35.15	$35.84	$35.34	$35.50	$35.96	$35.71	$35.70
RT Delta %	-3.0%	-2.7%	-3.3%	-3.1%	-3.3%	-3.2%	-3.1%	-3.1%	-3.0%

January-23	NEMA	CT	ME	NH	VT	RI	SEMA	WCMA	Hub
Day-Ahead	$49.56	$47.76	$48.95	$49.57	$49.06	$49.02	$49.68	$49.11	$49.14
Real-Time	$51.05	$49.18	$50.27	$50.88	$49.44	$50.45	$51.13	$50.43	$50.51
RT Delta %	3.0%	3.0%	2.7%	2.7%	0.8%	2.9%	2.9%	2.7%	2.8%
January-24	**NEMA**	**CT**	**ME**	**NH**	**VT**	**RI**	**SEMA**	**WCMA**	**Hub**
Day-Ahead	$76.50	$75.93	$73.85	$76.06	$75.80	$77.63	$77.55	$76.83	$76.84
Real-Time	$68.66	$68.15	$65.18	$67.93	$67.99	$69.18	$69.93	$68.83	$68.91
RT Delta %	-10.2%	-10.2%	-11.7%	-10.7%	-10.3%	-10.9%	-9.8%	-10.4%	-10.3%
Annual Diff.	**NEMA**	**CT**	**ME**	**NH**	**VT**	**RI**	**SEMA**	**WCMA**	**Hub**
Yr over Yr DA	54.4%	59.0%	50.9%	53.4%	54.5%	58.4%	56.1%	56.4%	56.4%
Yr over Yr RT	34.5%	38.6%	29.7%	33.5%	37.5%	37.1%	36.8%	36.5%	36.4%

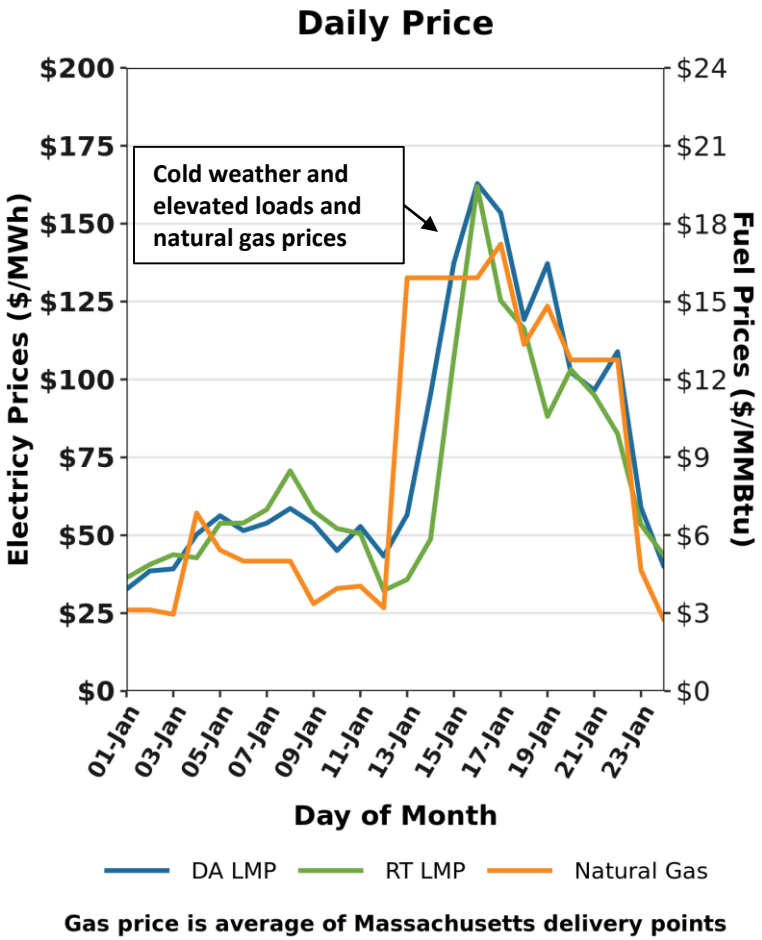
Hourly DA LMPs, January 1-24, 2024



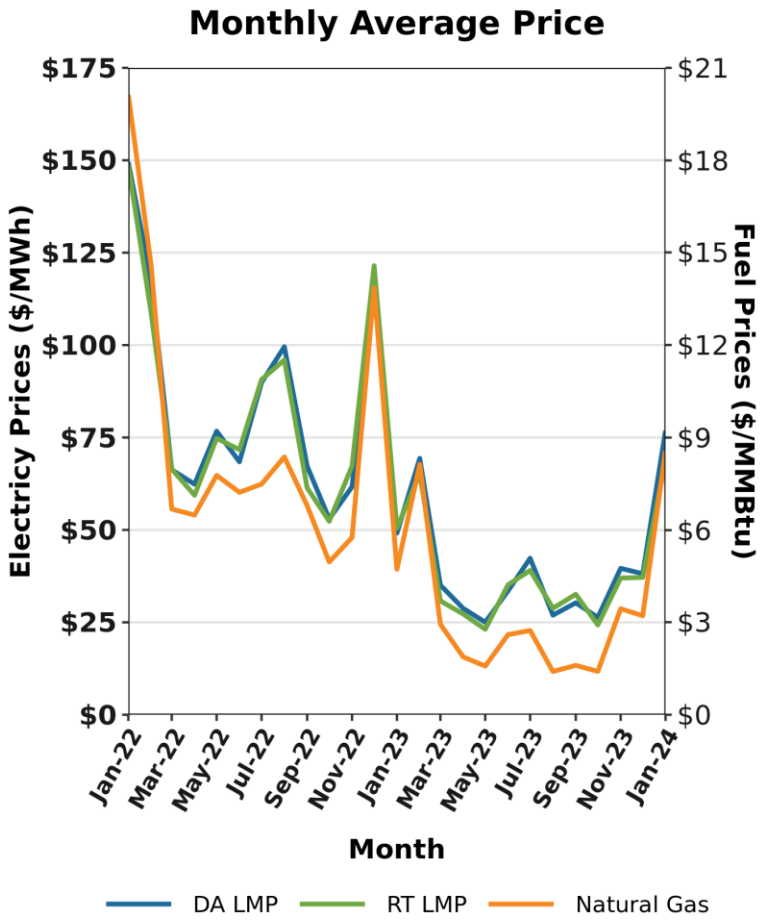
Hourly RT LMPs, January 1-24, 2024



Wholesale electricity vs Natural Gas prices by Month



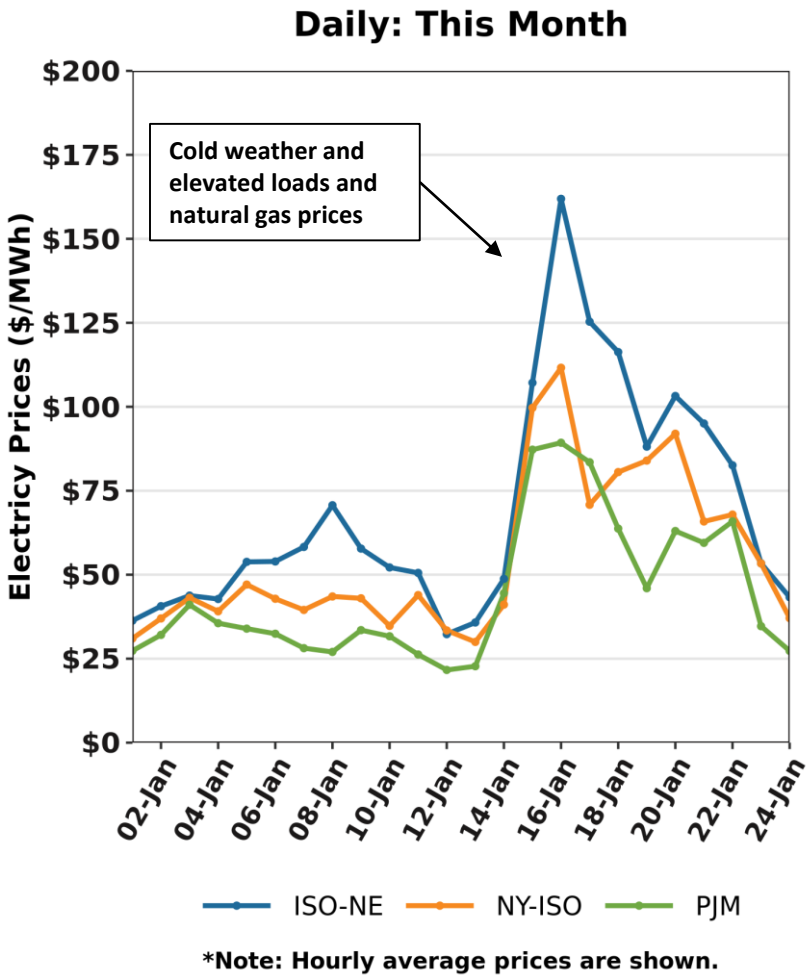
Gas price is average of Massachusetts delivery points



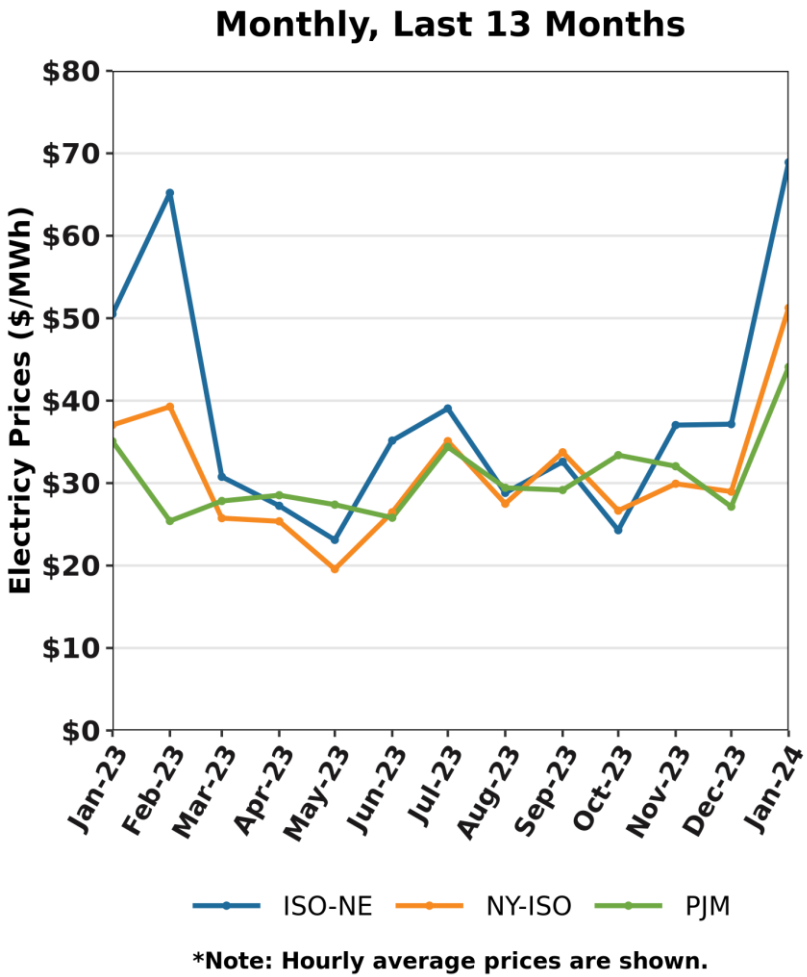
Underlying natural gas data furnished by:

ice Global markets in clear view

New England, NY, and PJM Hourly Average Real-Time Prices by Month

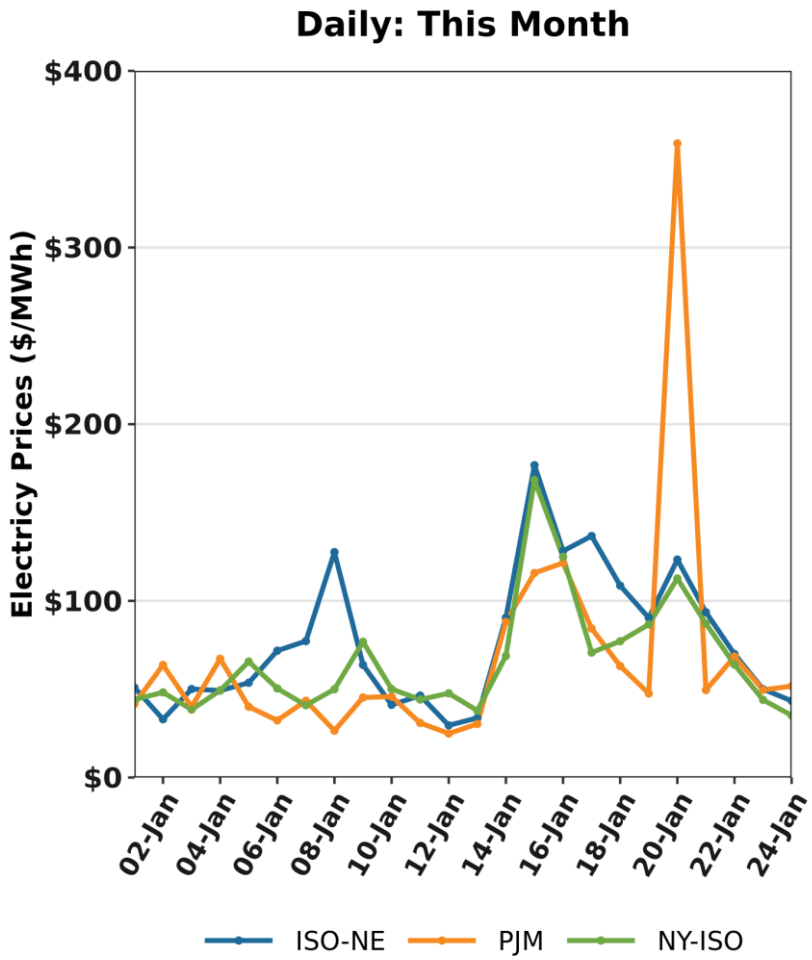


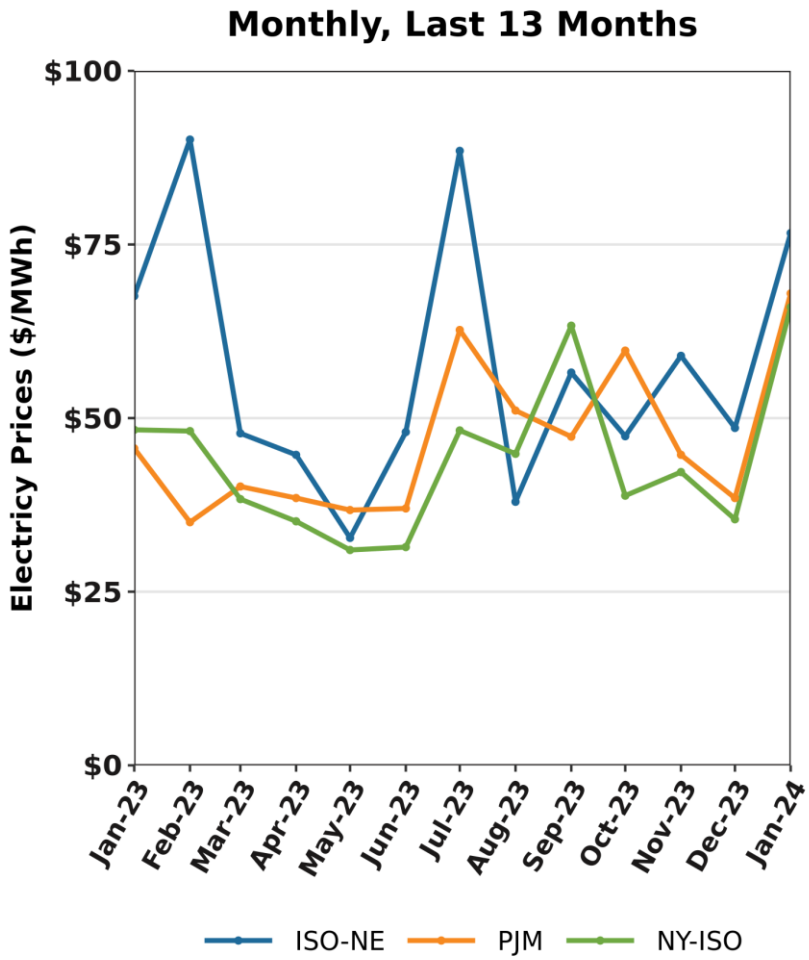
*Note: Hourly average prices are shown.



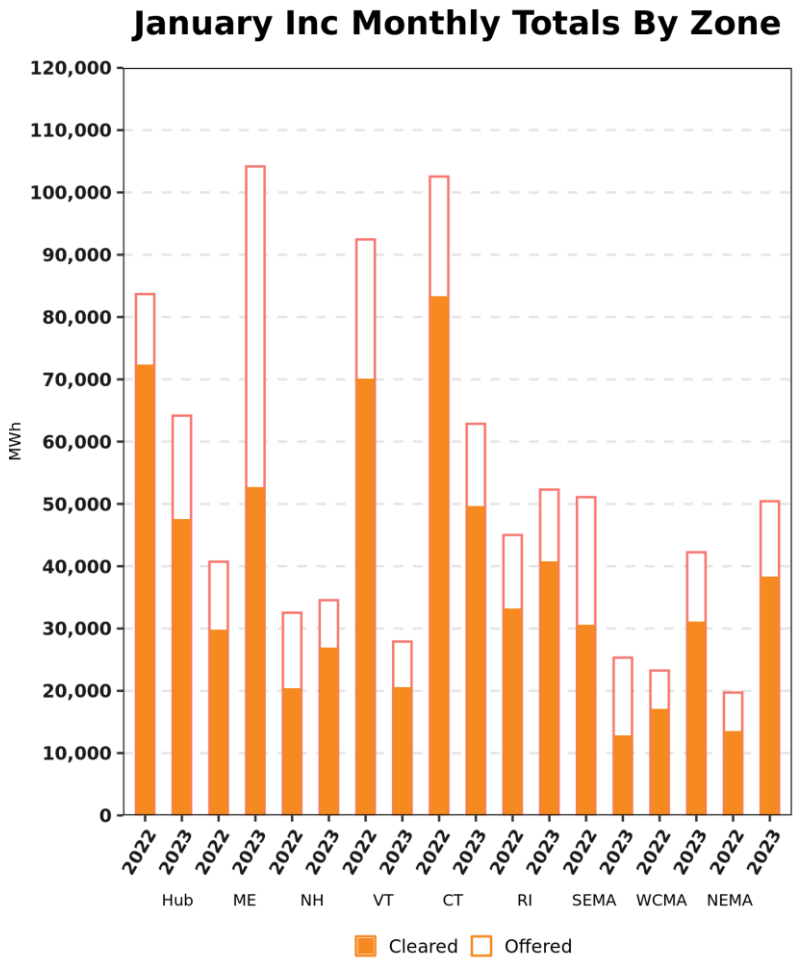
*Note: Hourly average prices are shown.

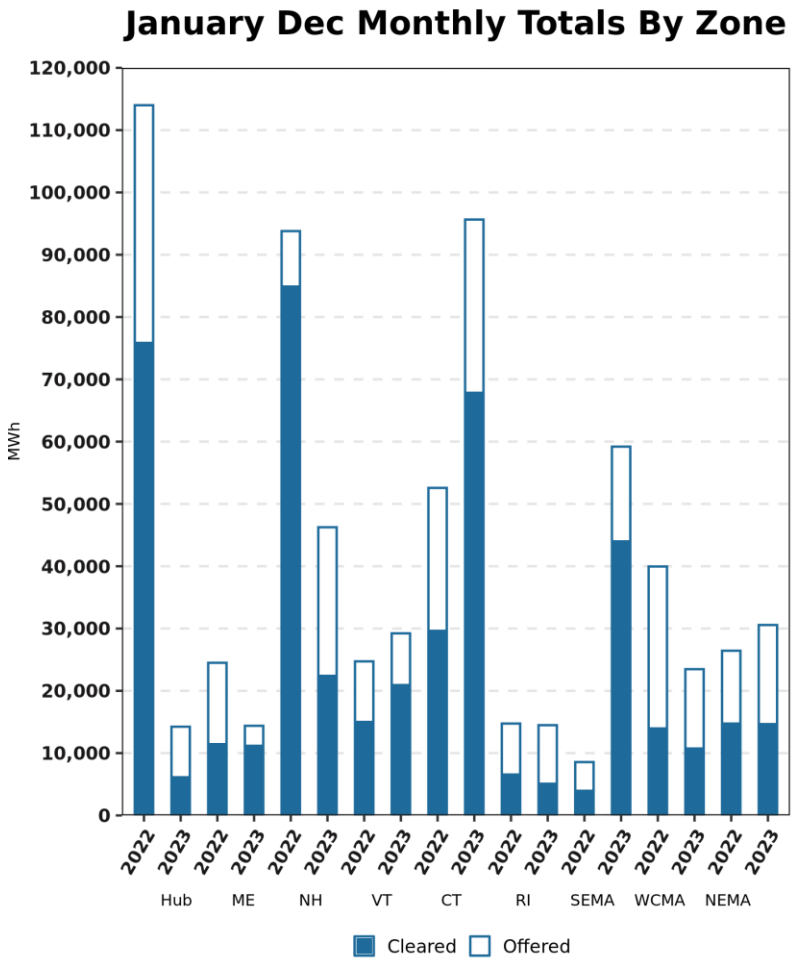
New England, NY, and PJM Average Peak Hour Real-Time Prices





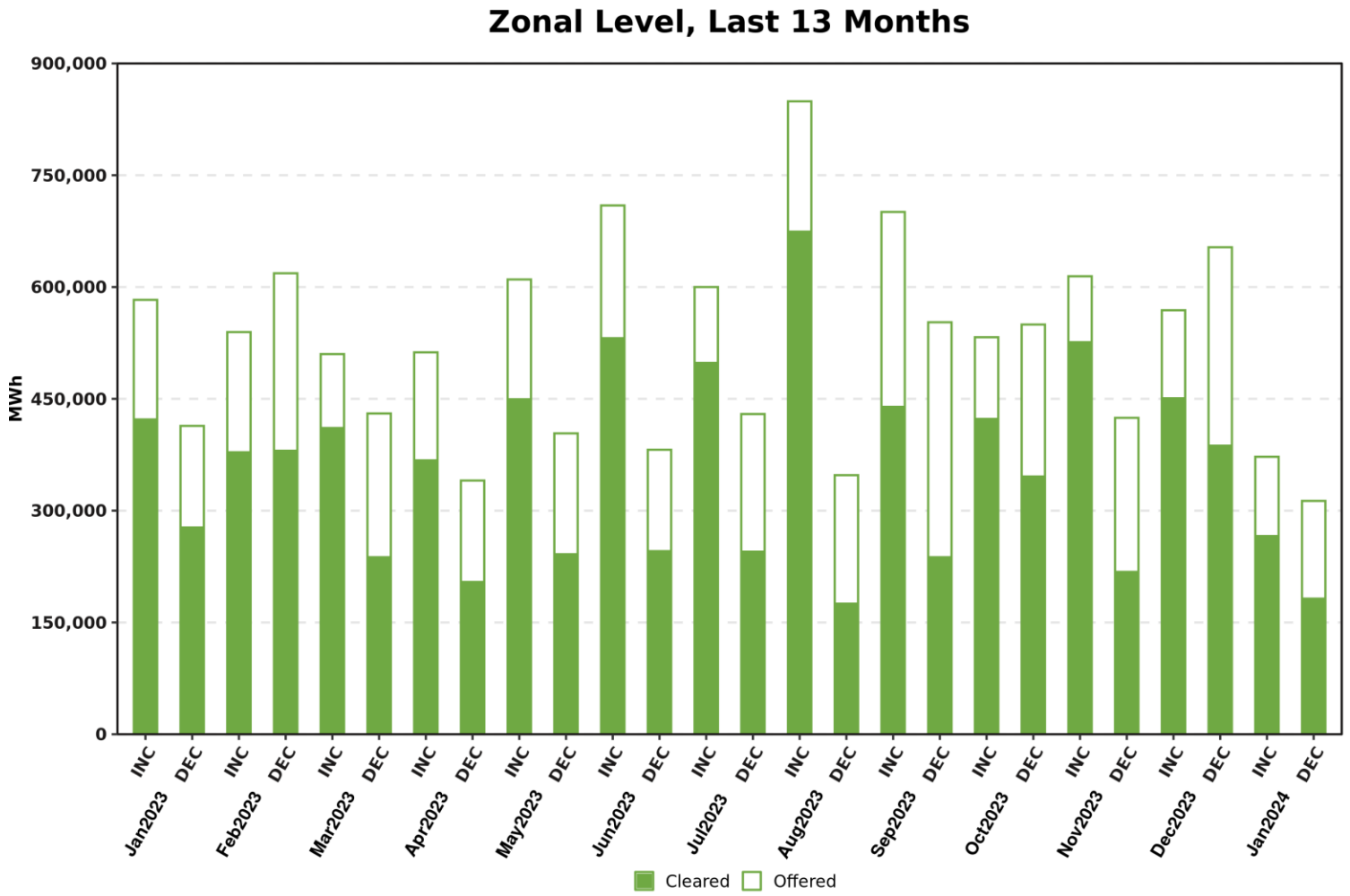
Zonal Increment Offers and Decrement Bid Amounts





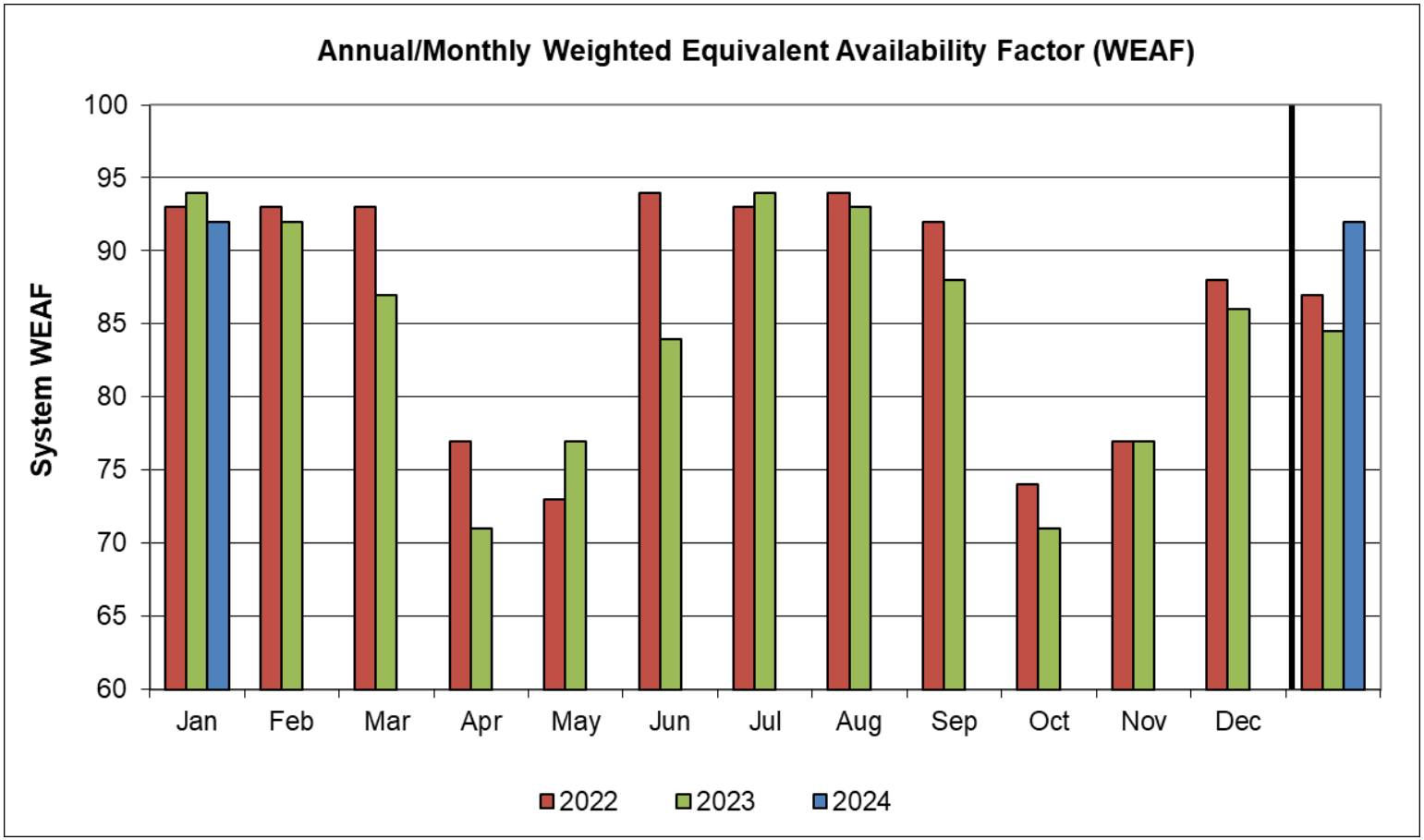
Includes nodal activity within the zone; excludes external nodes

Zonal Increment Offers and Decrement Bid Amounts



Includes nodal activity within the zone; excludes external nodes

System Unit Availability



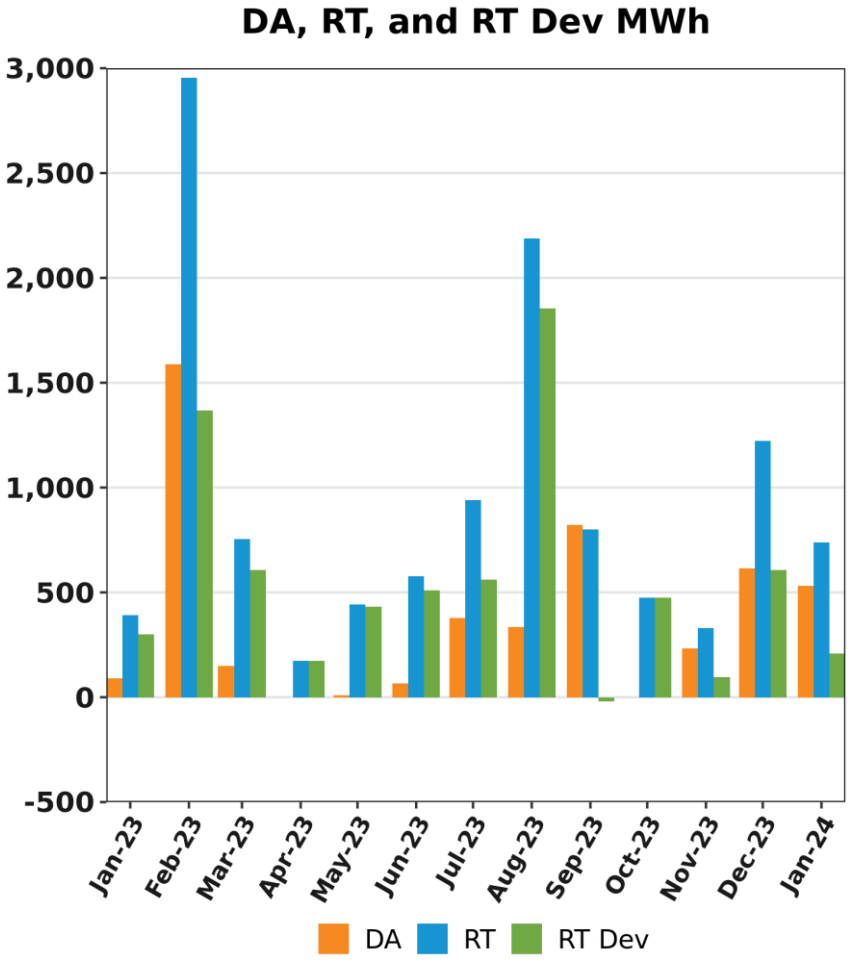
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2024	92												92
2023	94	92	87	71	77	84	94	93	88	71	77	86	85
2022	93	93	93	77	73	94	93	94	92	74	77	88	87

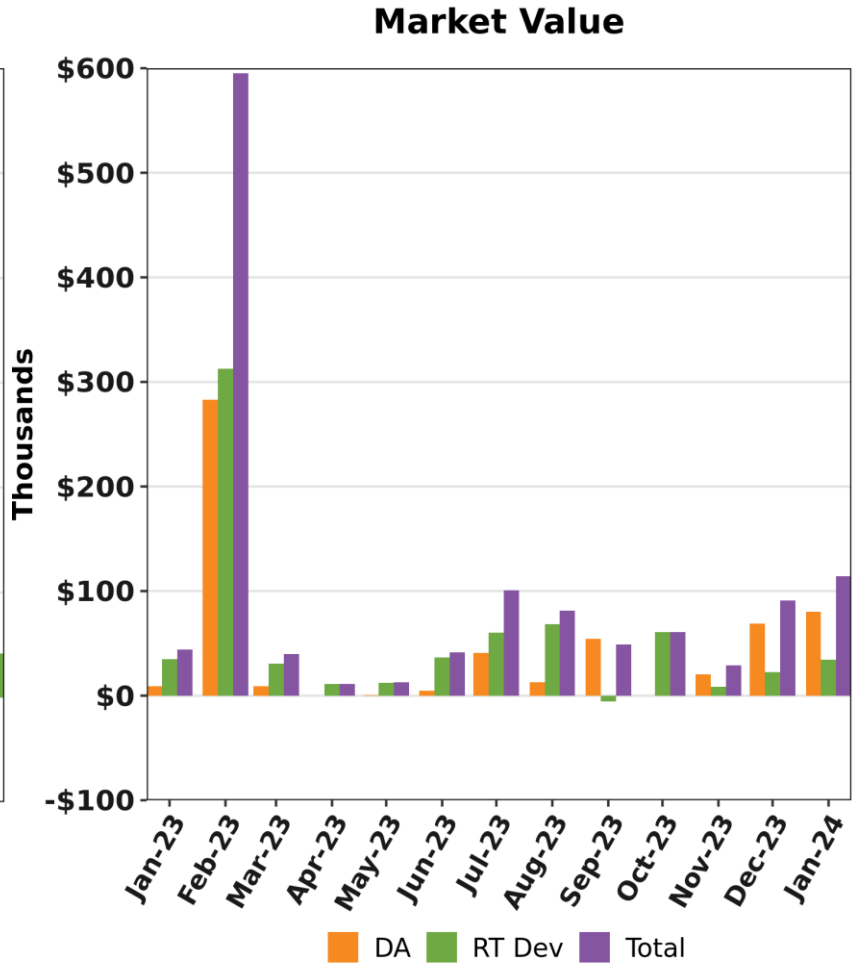
Data as of 1/20/2024

BACK-UP DETAIL

DEMAND RESPONSE

Price Responsive Demand (PRD) Energy Market Activity by Month





Note: DA and RT (deviation) MWh are settlement obligations and reflect appropriate gross-ups for distribution losses.

NEW GENERATION

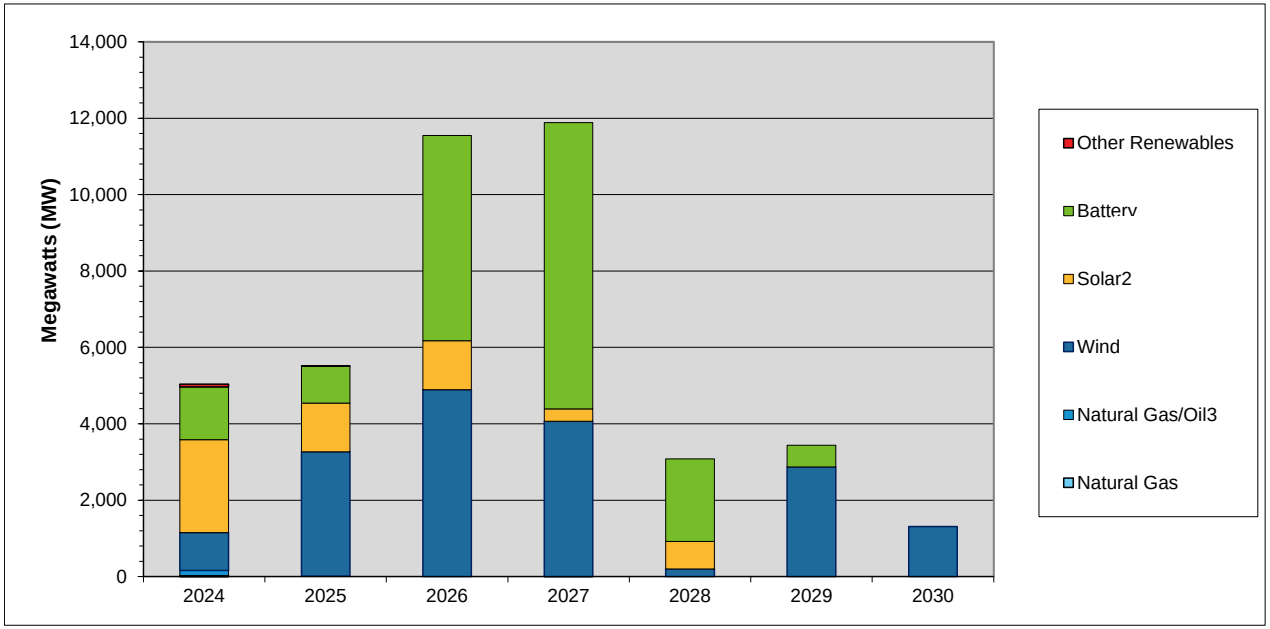
New Generation Update

Based on Queue as of 01/29/24

- Nine projects totaling 1,155 MW were added to the interconnection queue since the last update
  - One wind, two solar, three solar with battery and three battery storage projects with in-service dates between 2025 and 2031
- In total, 406 generation projects are currently being tracked by the ISO, totaling approximately 43,018 MW

Actual and Projected Annual Capacity Additions

By Supply Fuel Type and Demand Resource Type



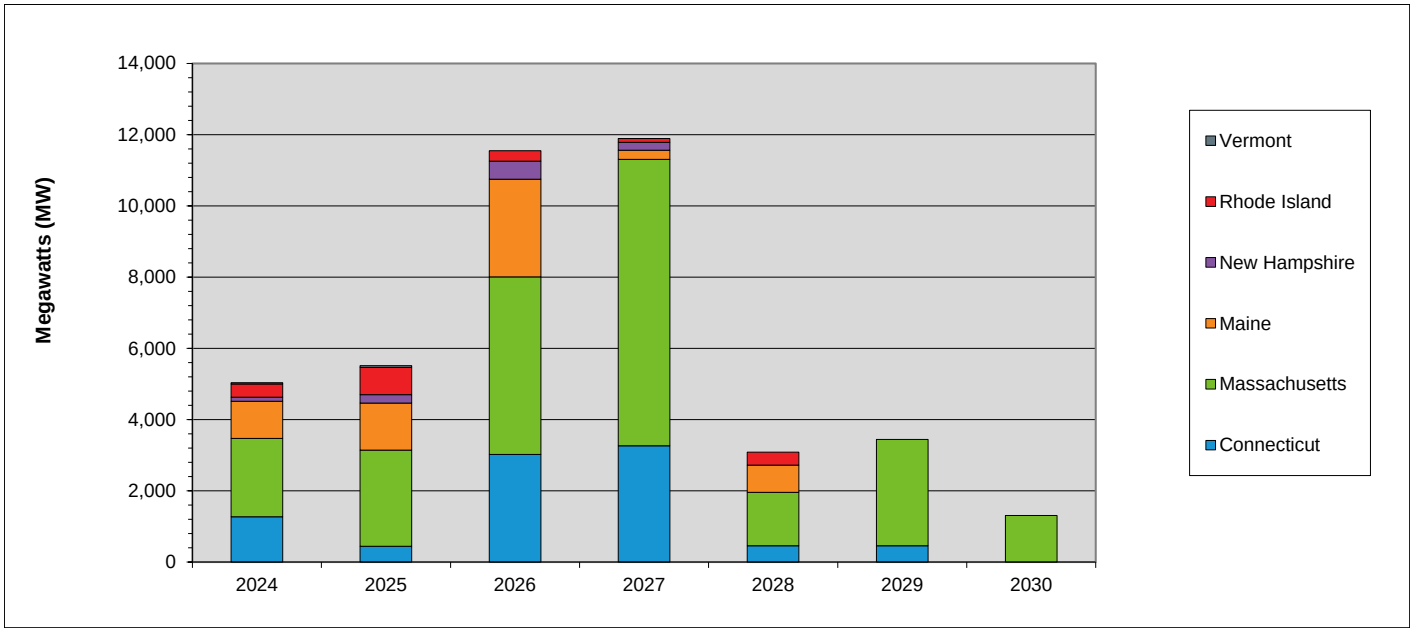
	2024	2025	2026	2027	2028	2029	2030	Total MW	% of Total[1]
Other Renewables	72	2	0	0	0	0	0	74	0.2
Battery	1,384	965	5,378	7,498	2,160	569	0	17,954	42.9
Solar[2]	2,432	1,278	1,280	323	725	0	0	6,038	14.4
Wind	989	3,249	4,893	4,064	197	2,870	1,309	17,571	42.0
Natural Gas/Oil[3]	135	16	0	0	0	0	0	151	0.4
Natural Gas	26	0	0	4	0	0	0	30	0.1
Totals	**5,038**	**5,510**	**11,551**	**11,889**	**3,082**	**3,439**	**1,309**	**41,818**	**100.0**

[1] Sum may not equal 100% due to rounding

[2] This category includes both solar-only, and co-located solar and battery projects

[3] The projects in this category are dual fuel, with either gas or oil as the primary fuel

Actual and Projected Annual Generator Capacity Additions
By State



	2024	2025	2026	2027	2028	2029	2030	Total MW	% of Total[1]
Vermont	40	50	0	0	0	0	0	90	0.2
Rhode Island	371	758	295	102	360	0	0	1,886	4.5
New Hampshire	114	239	504	226	0	0	0	1,083	2.6
Maine	1,039	1,323	2,743	254	764	0	0	6,123	14.6
Massachusetts	2,204	2,696	4,985	8,046	1,503	2,985	1,309	23,728	56.7
Connecticut	1,270	444	3,024	3,261	455	454	0	8,908	21.3
Totals	**5,038**	**5,510**	**11,551**	**11,889**	**3,082**	**3,439**	**1,309**	**41,818**	**100.0**

[1] **Sum may not equal 100% due to rounding**

New Generation Projection

By Fuel Type

Unit Type	Total		Green		Yellow	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
Biomass/Wood Waste	0	0	0	0	0	0
Battery Storage	117	17,954	0	0	117	17,954
Fuel Cell	4	46	1	20	3	26
Hydro	1	28	1	28	0	0
Natural Gas	4	30	0	0	4	30
Natural Gas/Oil	3	151	1	62	2	89
Nuclear	0	0	0	0	0	0
Solar	248	6,038	15	343	233	5,695
Wind	29	18,771	2	926	27	17,845
Total	406	43,018	20	1,379	386	41,639

- Projects in the Natural Gas/Oil category may have either gas or oil as the primary fuel
- Green denotes projects with a high probability of going into service within the next 12 months
- Yellow denotes projects with a lower probability of going into service or new applications

New Generation Projection

By Operating Type

Operating Type	Total		Green		Yellow	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
Baseload	7	87	2	48	5	39
Intermediate	2	89	0	0	2	89
Peaker	368	24,071	16	405	352	23,666
Wind Turbine	29	18,771	2	926	27	17,845
Total	406	43,018	20	1,379	386	41,639

- Green denotes projects with a high probability of going into service within the next 12 months
- Yellow denotes projects with a lower probability of going into service or new applications

New Generation Projection

By Operating Type and Fuel Type

Unit Type	Total		Baseload		Intermediate		Peaker		Wind Turbine	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
Biomass/Wood Waste	0	0	0	0	0	0	0	0	0	0
Battery Storage	117	17,954	0	0	0	0	117	17,954	0	0
Fuel Cell	4	46	4	46	0	0	0	0	0	0
Hydro	1	28	1	28	0	0	0	0	0	0
Natural Gas	4	30	2	13	0	0	2	17	0	0
Natural Gas/Oil	3	151	0	0	2	89	1	62	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0
Solar	248	6,038	0	0	0	0	248	6,038	0	0
Wind	29	18,771	0	0	0	0	0	0	29	18,771
Total	406	43,018	7	87	2	89	368	24,071	29	18,771

- Projects in the Natural Gas/Oil category may have either gas or oil as the primary fuel

FORWARD CAPACITY MARKET

Capacity Supply Obligation FCA 14

Resource Type	Resource Type	FCA	ARA 1		ARA 2		ARA 3	
		CSO	CSO	Change	CSO	Change	CSO	Change
		MW	MW	MW	MW	MW	MW	MW
Demand	*Active Demand*	592.043	688.07	96.027	659.671	-28.399	564.371	-95.3
	Passive Demand	3,327.071	3,327.932	0.861	3,315.207	-12.725	3,253.179	-62.028
Demand Total		**3,919.114**	**4,016.002**	**96.888**	**3,974.878**	**-41.124**	**3,817.550**	**-157.328**
Generator	*Non-Intermittent*	27,816.902	28,275.143	458.241	27,697.714	-577.429	27,684.252	-13.462
	Intermittent	1,160.916	1,128.446	-32.47	925.942	-202.504	893.444	-32.498
Generator Total		**28,977.818**	**29,403.589**	**425.771**	**28,623.656**	**-779.933**	**28,577.696**	**-45.96**
Import Total		**1,058.72**	**1,058.72**	**0**	**1,029.800**	**-28.92**	**958.380**	**-71.42**
Grand Total*		**33,955.652**	**34,478.311**	**522.661**	**33,628.334**	**-849.977**	**33,353.626**	**-274.708**
Net ICR (NICR)		**32,490**	**32,980**	**490**	**31,480**	**-1,500**	**31,690**	**210**

* Grand Total reflects both CSO Grand Total and the net total of the Change Column

Note: A resource's CSO may change for a variety of reasons outside ISO-NE administered trading windows. Reasons for CSO changes reconfiguration auctions may include terminations or recent declaration of commercial operation. Details of the changes that occurred due to non-annual event purposes are contained in the 2015-2023 CCP Monthly Capacity Supply Obligation Changes report on the ISO New England website.

Capacity Supply Obligation FCA 15

Resource Type	Resource Type	FCA	ARA 1		ARA 2		ARA 3	
		CSO	CSO	Change	CSO	Change	CSO	Change
		MW	MW	MW	MW	MW	MW	MW
Demand	*Active Demand*	677.673	673.401	-4.272	579.692	-93.709		
	Passive Demand	3,212.865	3,211.403	-1.462	3,134.652	-76.751		
Demand Total		**3,890.538**	**3,884.804**	**-5.734**	**3,714.344**	**-170.460**		
Generator	*Non-Intermittent*	28,154.203	27,714.778	-439.425	27,081.653	-633.125		
	Intermittent	1,089.265	1,073.794	-15.471	1,056.601	-17.193		
Generator Total		**29,243.468**	**28,788.572**	**-454.896**	**28,138.254**	**-650.318**		
Import Total		**1,487.059**	**1297.132**	**-189.927**	**1,249.545**	**-47.587**		
Grand Total*		**34,621.065**	**33,970.508**	**-650.557**	**33,102.143**	**-868.365**		
Net ICR (NICR)		**33,270**	**31,775**	**-1,495**	**31,545**	**-230**		

* Grand Total reflects both CSO Grand Total and the net total of the Change Column

Note: A resource's CSO may change for a variety of reasons outside ISO-NE administered trading windows. Reasons for CSO changes beyond and reconfiguration auctions may include terminations or recent declaration of commercial operation. Details of the changes that occurred due to non-annual event purposes are contained in the 2015-2023 CCP Monthly Capacity Supply Obligation Changes report on the ISO New England website.

Capacity Supply Obligation FCA 16

Resource Type	Resource Type	FCA	ARA 1		ARA 2		ARA 3	
		CSO	CSO	Change	CSO	Change	CSO	Change
		MW	MW	MW	MW	MW	MW	MW
Demand	*Active Demand*	765.35	589.882	-175.468				
	Passive Demand	2,557.256	2,579.120	21.864				
Demand Total		**3,322.606**	**3,169.002**	**-153.604**				
Generator	*Non-Intermittent*	26,805.003	26,643.379	-161.624				
	Intermittent	1,178.933	1,146.783	-32.15				
Generator Total		**27,983.936**	**27,790.162**	**-193.774**				
Import Total		**1,503.842**	**1,247.601**	**-256.241**				
Grand Total*		**32,810.384**	**32,206.765**	**-603.619**				
Net ICR (NICR)		**31,645**	**30,585**	**-1,060**				

* Grand Total reflects both CSO Grand Total and the net total of the Change Column

Note: A resource's CSO may change for a variety of reasons outside ISO-NE administered trading windows. Reasons for CSO changes reconfiguration auctions may include terminations or recent declaration of commercial operation. Details of the changes that occurred due to non-annual event purposes are contained in the 2015-2023 CCP Monthly Capacity Supply Obligation Changes report on the ISO New England website.

Capacity Supply Obligation FCA 17

Resource Type	Resource Type	FCA	ARA 1		ARA 2		ARA 3	
		CSO	CSO	Change	CSO	Change	CSO	Change
		MW	MW	MW	MW	MW	MW	MW
Demand	*Active Demand*	622.854						
	Passive Demand	2,316.815						
Demand Total		**2,939.669**						
Generator	*Non-Intermittent*	26,507.420						
	Intermittent	1,356.084						
Generator Total		**27,863.504**						
Import Total		**566.998**						
Grand Total*		**31,370.171**						
Net ICR (NICR)		**30,305**						

* Grand Total reflects both CSO Grand Total and the net total of the Change Column

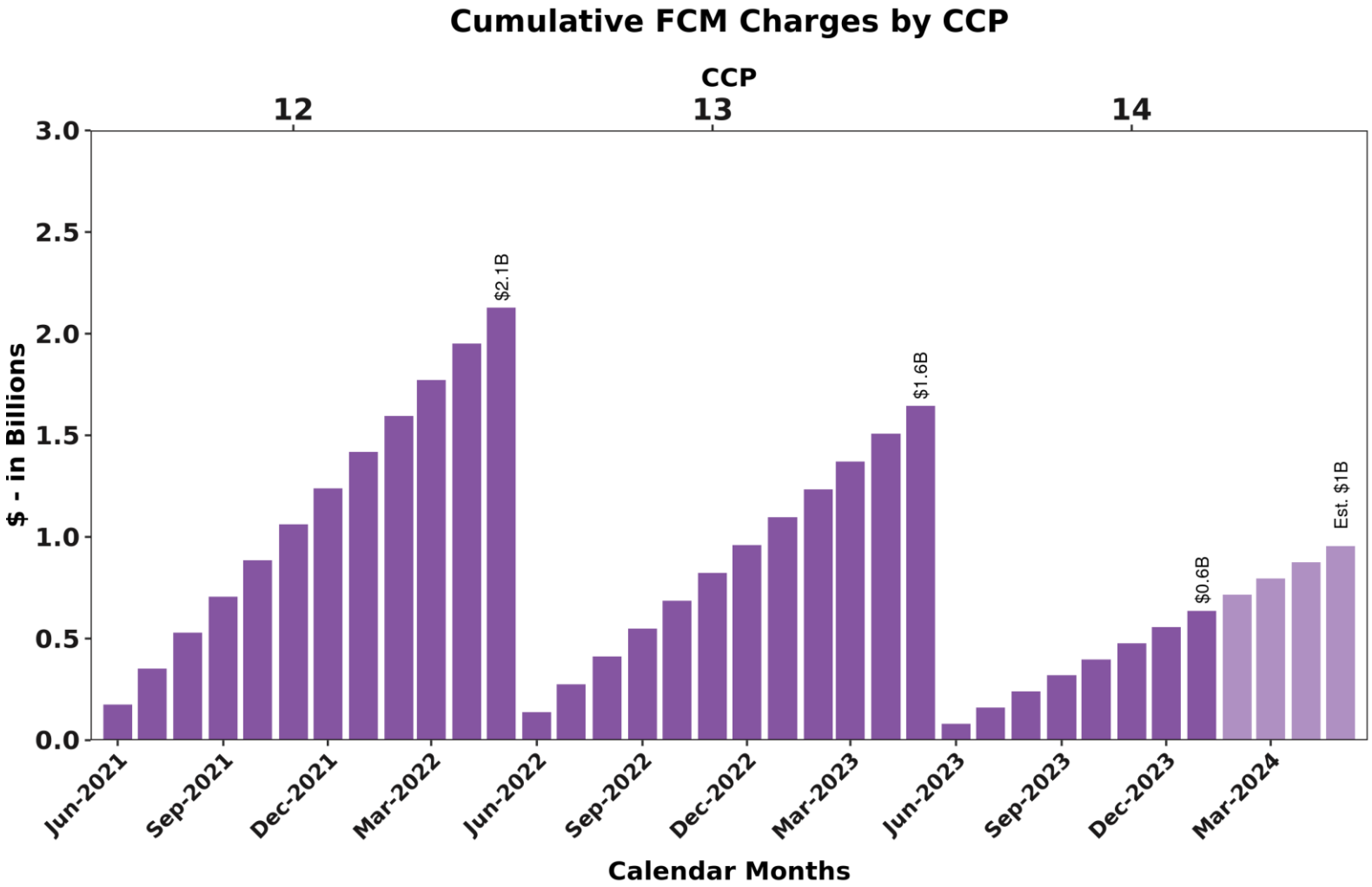
Note: A resource's CSO may change for a variety of reasons outside ISO-NE administered trading windows. Reasons for CSO changes beyond reconfiguration auctions may include terminations or recent declaration of commercial operation. Details of the changes that occurred due to non-annual event purposes are contained in the 2015-2023 CCP Monthly Capacity Supply Obligation Changes report on the ISO New England website.

Active/Passive Demand Response

CSO Totals by Commitment Period

Commitment Period	Active/Passive	Existing	New	Grand Total
2019-20	Active	357.221	20.304	377.525
	Passive	2,018.20	350.43	2,368.63
	Grand Total	**2,375.422**	**370.734**	**2,746.156**
2020-21	Active	334.634	85.294	419.928
	Passive	2,236.73	554.292	2,791.02
	Grand Total	**2,571.361**	**639.586**	**3,210.947**
2021-22	Active	480.941	143.504	624.445
	Passive	2,604.79	370.568	2,975.36
	Grand Total	**3,085.734**	**514.072**	**3,599.806**
2022-23	Active	598.376	87.178	685.554
	Passive	2,788.33	566.363	3,354.69
	Grand Total	**3,386.703**	**653.541**	**4,040.244**
2023-24	Active	560.55	31.493	592.043
	Passive	3,035.51	291.565	3,327.07
	Grand Total	**3,596.056**	**323.058**	**3,919.114**
2024-25	Active	674.153	3.520	677.673
	Passive	3,046.064	166.801	3,212.865
	Grand Total	**3,720.217**	**170.321**	**3,890.538**
2025-26	Active	664.01	101.34	765.35
	Passive	2,428.638	128.618	2557.256
	Grand Total	**3,092.648**	**229.958**	**3,322.606**

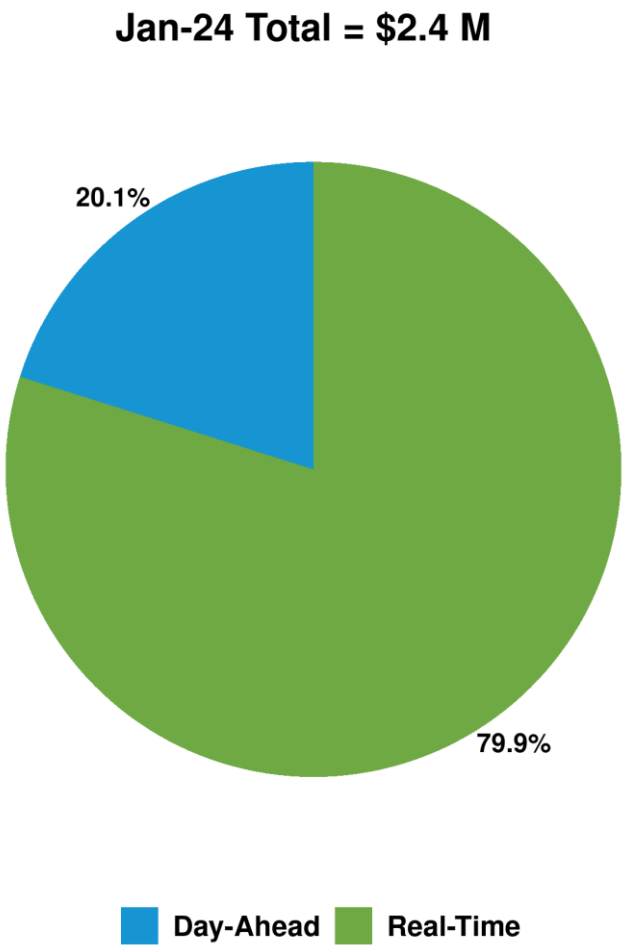
Forward Capacity Market Auctions

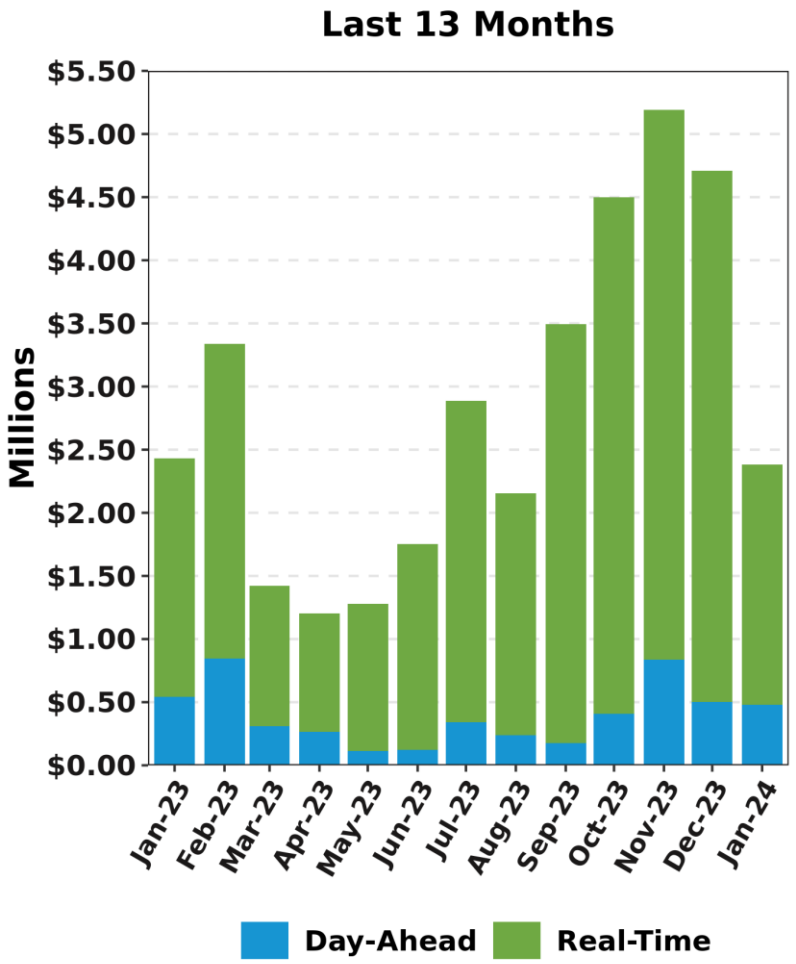


*The items in the graph shaded in a lighter color represent the forecast for future months in the Capacity Commitment Period (CCP)

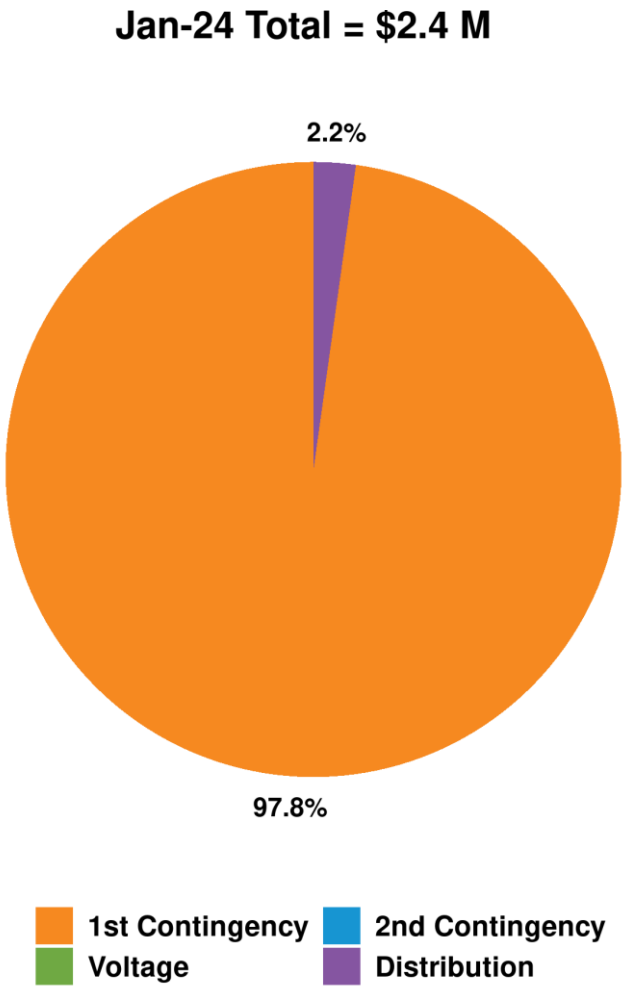
NET COMMITMENT PERIOD COMPENSATION

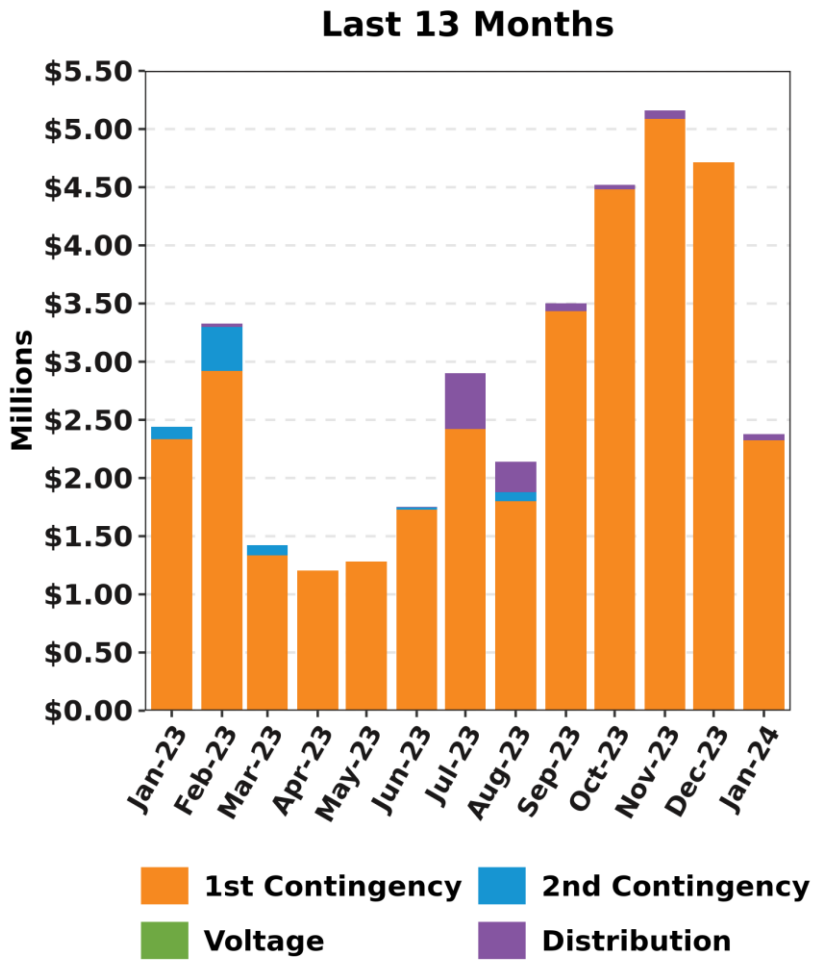
DA and RT NCPC Charges



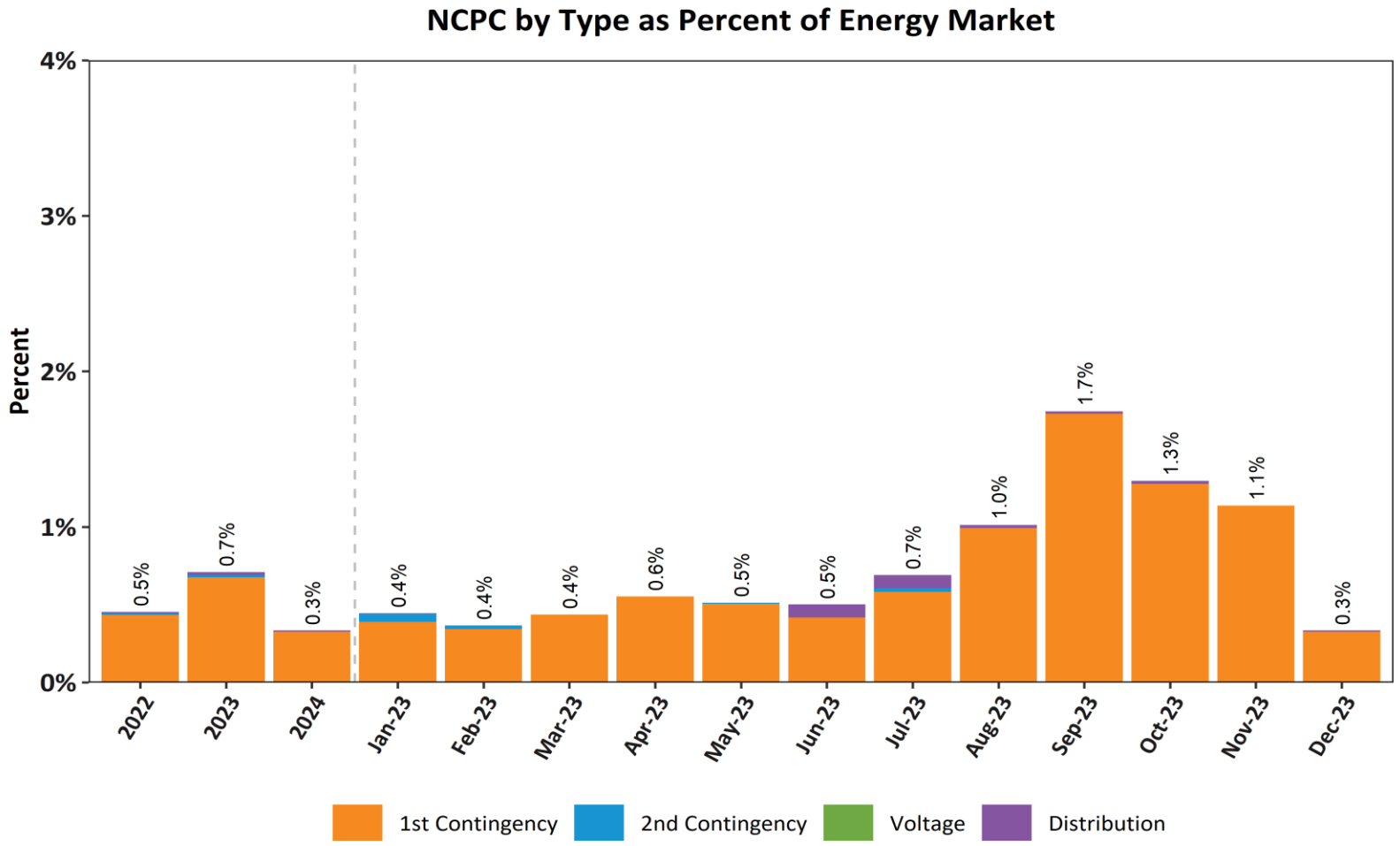


NCPC Charges by Type

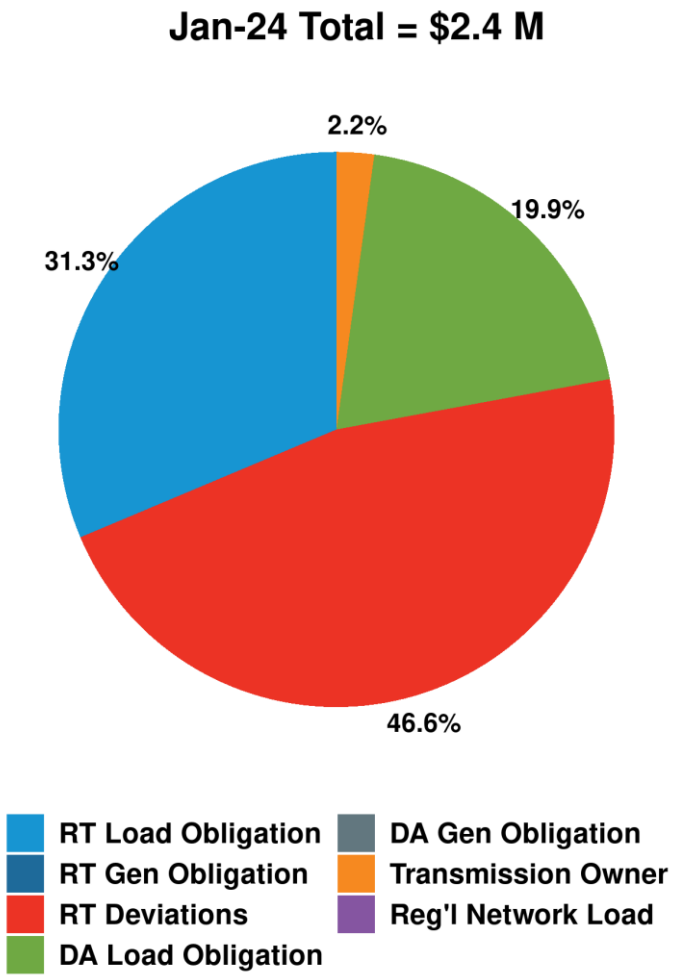


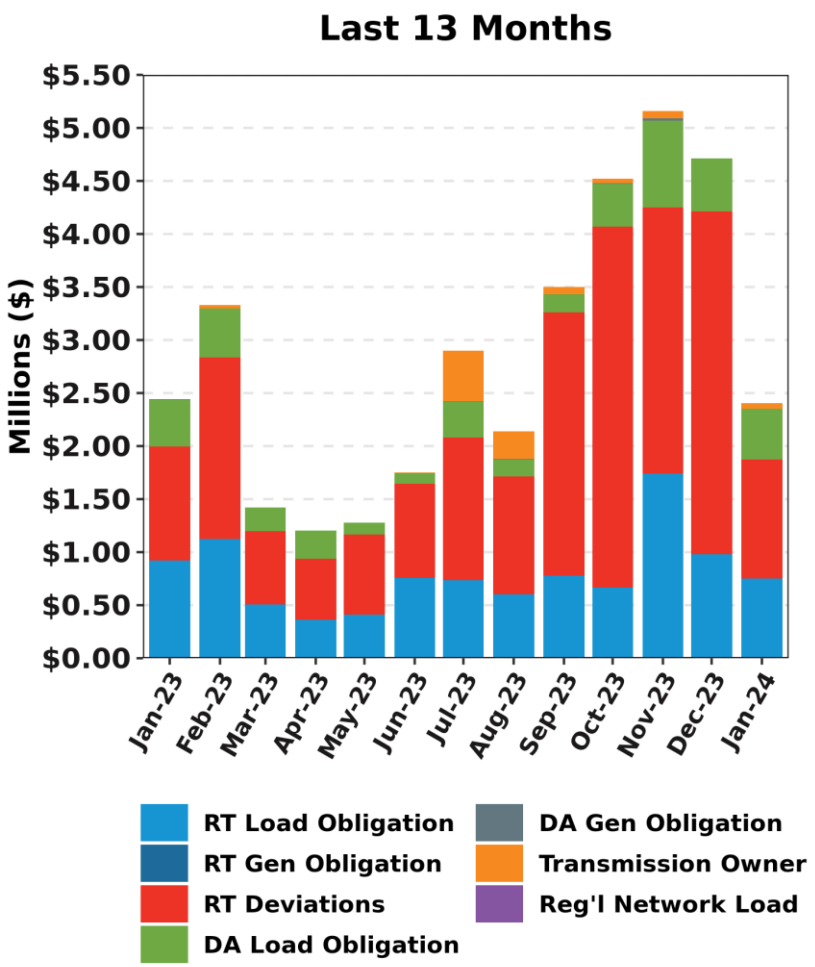


NCPC Charges by Type as percent of Energy Market Value

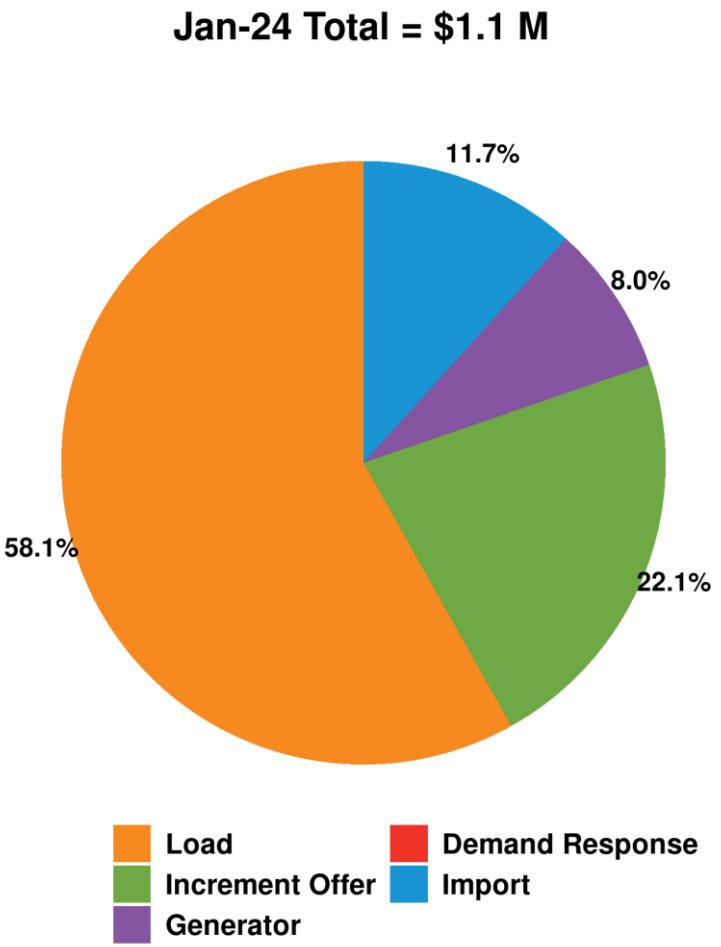


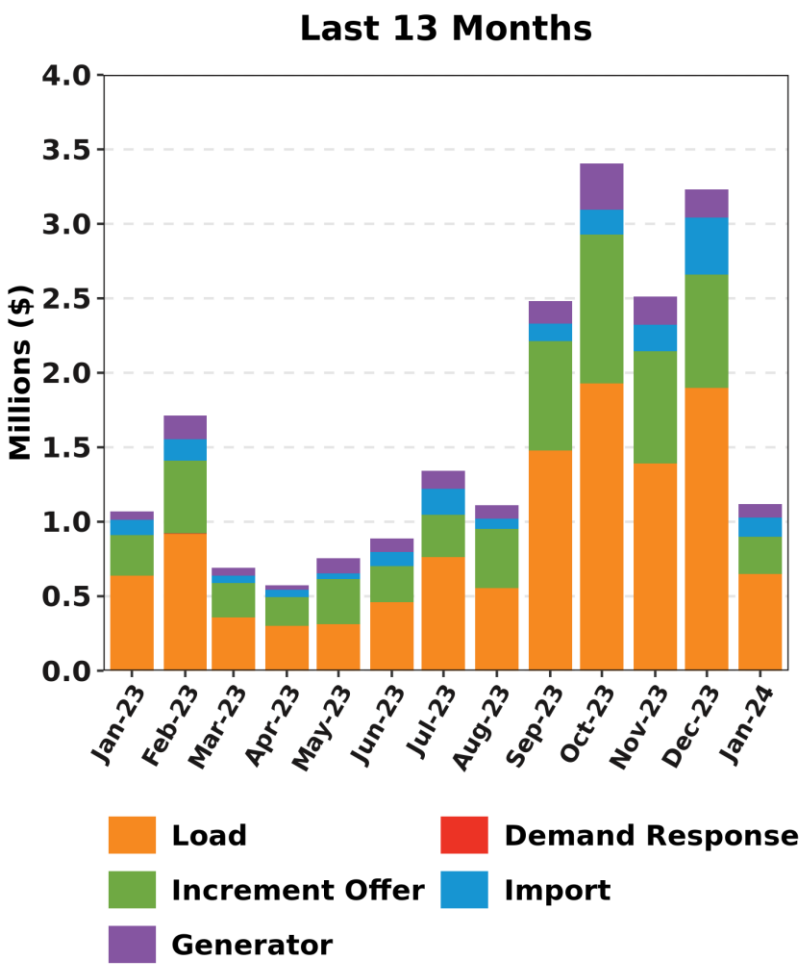
NCPC Charge Allocations





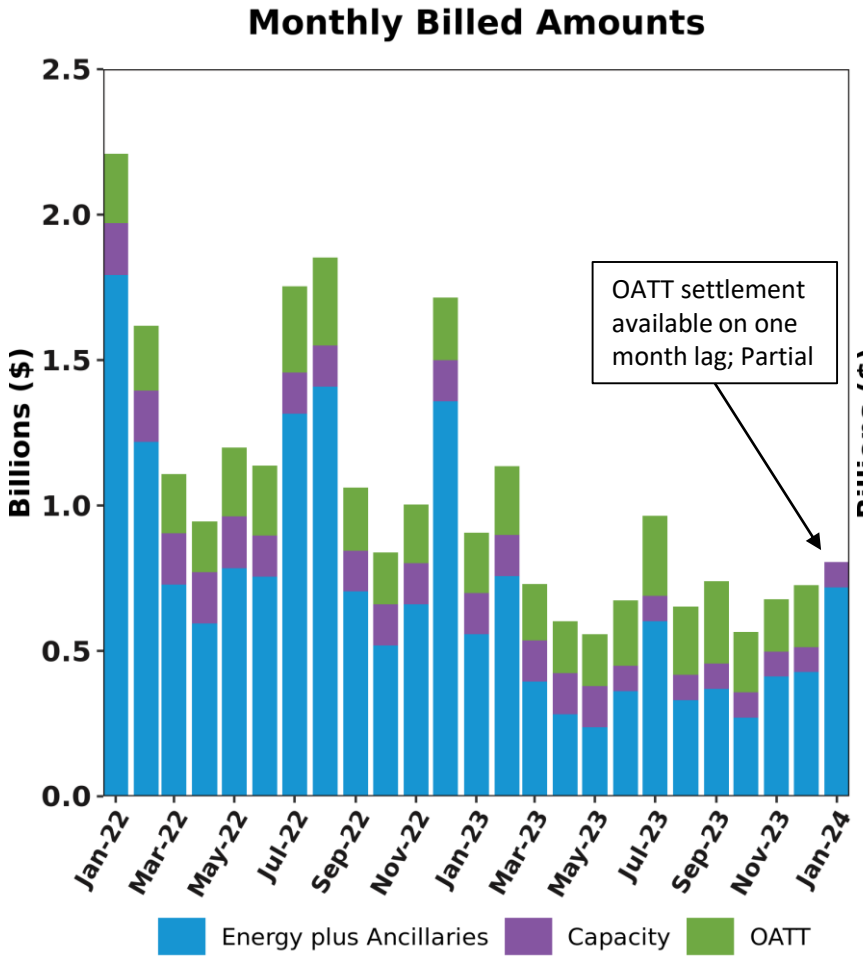
RT First Contingency Charges by Deviation Type

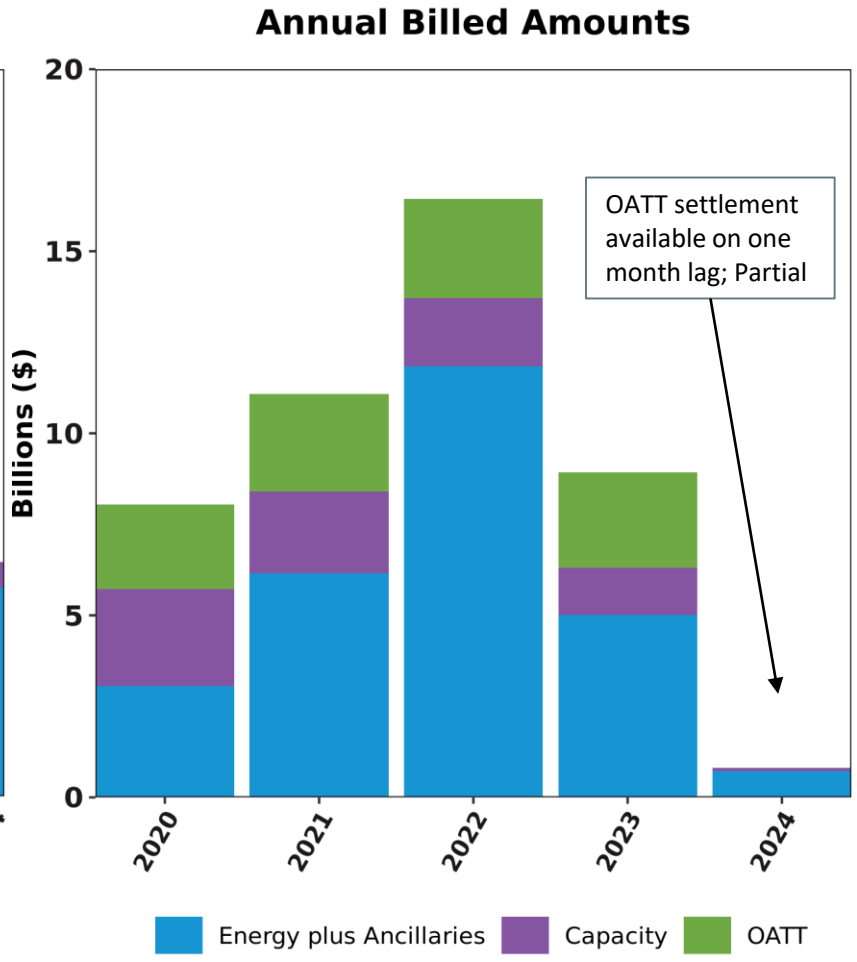




ISO BILLINGS

Total ISO Billings





*Ancillaries = Reserves, Regulation, NCPC, minus Marginal Loss Revenue Fund
*OATT = RNS, Through and Out, Schedule 9

REGIONAL SYSTEM PLAN (RSP)

Planning Advisory Committee (PAC)

- February 28 PAC Meeting Agenda Topics*
  - Asset Condition Projects
    - X-178 Rebuild (Northern NH Rebuilds) – Eversource
    - MEPCO Sections 396 and 3001 End of Life Strategy – Avangrid
  - Maine 2028 Short Circuit Solutions Study
  - SEMA 2028 Short Circuit Solutions Study
  - Boston 2033 Needs Assessment
  - Order 881 Update
  - 2050 Transmission Study – Scope of Additional Analysis
  - Economic Planning for the Clean Energy Transition (EPCET) – Final Sensitivities
  - Transmission Planning Technical Guide Update – Updates to Load Power Factors

* Agenda topics are subject to change. Visit https://www.iso-ne.com/committees/planning/planning-advisory for the latest PAC agendas.

2050 Transmission Study

- ISO provided initial results at the 3/16/22 PAC meeting
- Sensitivity results, as well as a high-level approach to solutions development, were discussed at the 4/28/22 PAC meeting
- ISO discussed updated results and the approximate duration of overloads at the 7/20/22 PAC meeting
- ISO began initial discussions on solution development and lessons learned at the 12/13/22 PAC meeting
- Additional discussion on solution development occurred at the 4/20/23 and 7/25/23 PAC meetings
- Development of transmission solutions and associated costs, including work by Electrical Consultants Inc. (ECI) on cost estimates, is now complete
- ISO presented solutions and associated costs at the 10/18/23 PAC meeting
- Draft report was posted on 11/1/23; ISO has received stakeholder comments and is preparing a written response
- Draft technical appendix was posted on 12/4/23, and a written response is being drafted

Economic Studies: EPCET

- Economic Planning for the Clean Energy Transition (EPCET) Pilot Study
  - An effort to review all assumptions in economic planning and perform a test study consistent with the changes to the Tariff
  - PAC presentations began in April 2022. To date, the ISO has presented results from the Benchmark, Market Efficiency Need, and Policy scenarios.
    - As announced at the October PAC, FGRS Phase 2 was to be completed via the EPCET Policy scenario. Results were presented at the December PAC
    - Further sensitivity results will be presented through Q1 2024
    - A report will be issued in Q2 2024

Economic Studies: 2024 Study

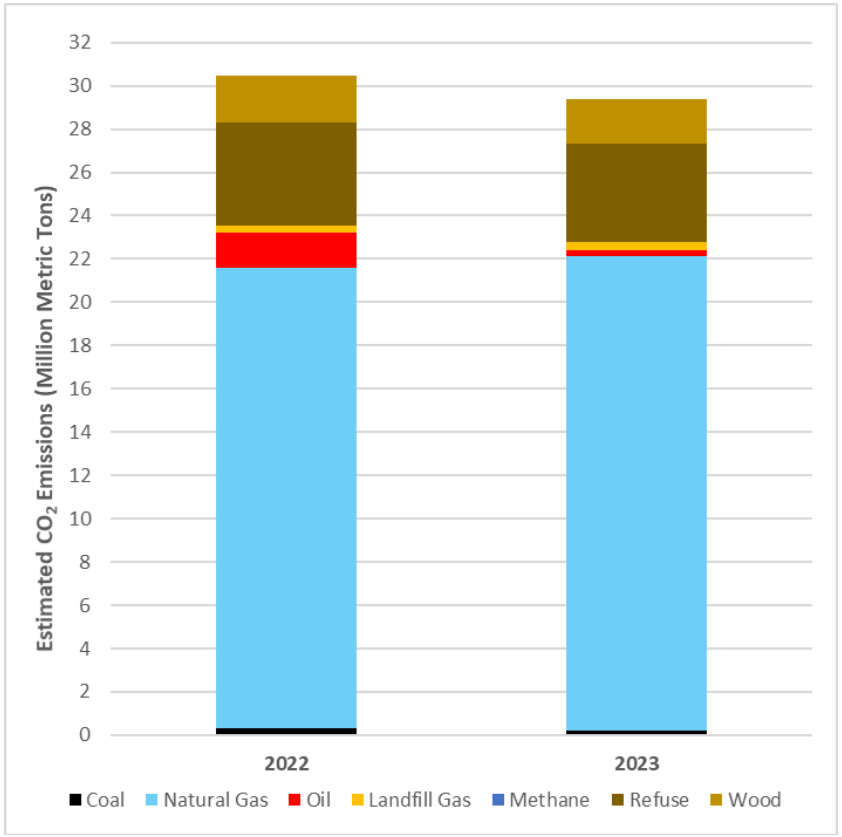
- 2024 Economic Study
  - First use of new Tariff language
    - Study was initiated at the January PAC meeting
  - Study will begin with Benchmark Scenario in Q1-Q2 2024, followed by Policy Scenario in Q3-Q4 2024
  - A Stakeholder-Requested Scenario can be submitted in Q2 2024 for consideration
  - Market Efficiency Needs Scenario will be studied in early 2025

ISO-NE Tie Benefits Evaluation

- The ISO started the tie benefits evaluation at the October 19 PSPC meeting. The second presentation was given at a special January 25 PSPC meeting and topics included:
  - Historical tie benefits results
  - Historical interregional tie flows
  - Load and resource diversity
- The scope of the project includes three major components
  - Historical review of external transfers
  - Future outlook for the northeast
  - Modeling assumptions review
- The evaluation will extend into Q3 of 2024
  - Additional PSPC time will be dedicated for this topic; the next meeting is scheduled for March 15

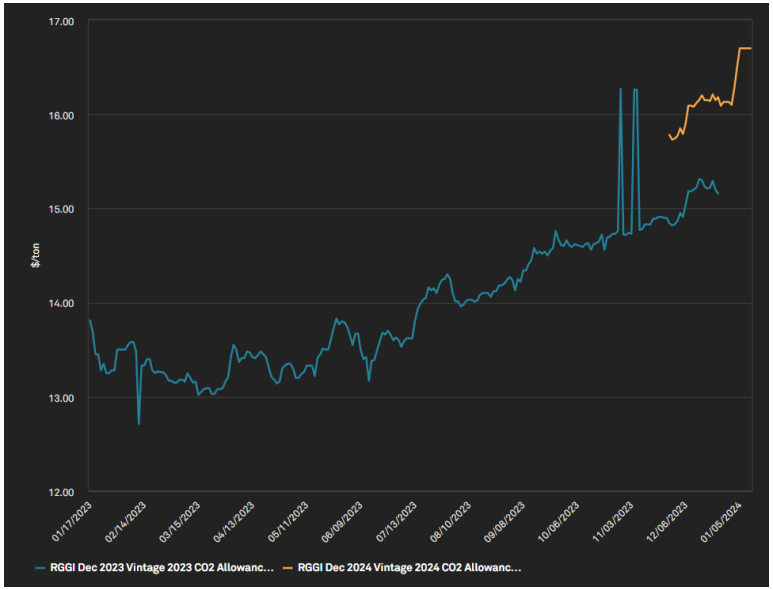
New England Power System Carbon Emissions

2022 vs. 2023 New England Power System Estimated Carbon Dioxide (CO_2) Emissions



Data as of 12/31/2023

RGGI Allowance Prices



- 1/11/24: RGGI allowance spot price - $16.70
- The 63rd RGGI Auction is scheduled for March 13, 2024
  - 11 of the 12 participating states are offering CO_2 allowances for sale
  - Pennsylvania is currently prohibited from offering allowances for sale (this ruling is under appeal)
  - Virginia is no longer part of RGGI

RGGI – Regional Greenhouse Gas Initiative

Massachusetts CO_2 Generator Emissions Cap

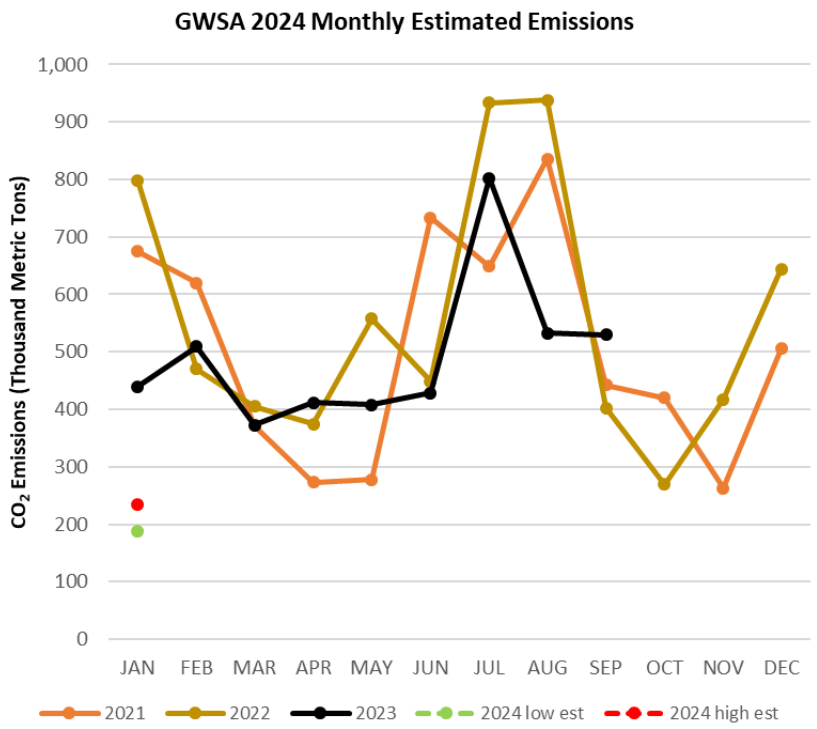
2024 Estimated Emissions Under CO_2 Cap

- As of 1/15/24, January estimated GWSA CO_2 emissions range between **188,771** and **234,000** metric tons
  - Year-to-date 2024 estimated emissions range between **2.5%** and **3.1%** of the 2024 cap of 7.61 MMT

2023 Estimated Emissions Under CO_2 Cap

- 2023 estimated total GWSA CO_2 emissions range between **65.5%** and **78.9%** of the 2023 cap of 7.84 MMT
- According to the EPA, 2023 4th quarter emissions reporting period ends on January 30, 2024

2021-2024 Estimated Monthly Emissions (Thousand Metric Tons)



GWSA – Global Warming Solutions Act
MMT – Million Metric Tons

Source: ISO-NE (estimated emissions)

RSP Project Stage Descriptions

Stage	Description
1	Planning and Preparation of Project Configuration
2	Pre-construction (e.g., material ordering, project scheduling)
3	Construction in Progress
4	In Service

Note: The listings in this section focus on major transmission line construction and rebuilding.

Greater Boston Projects

Status as of 1/18/2024

Plan Benefit: Addresses long-term system needs in the Greater Boston area and improves system reliability

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1213, 1220, 1365	Install new 345 kV line from Scobie to Tewksbury	Dec-17	4
1527, 1528	Reconductor the Y-151 115 kV line from Dracut Junction to Power Street	Apr-17	4
1212, 1549	Reconductor the M-139 115 kV line from Tewksbury to Pinehurst and associated work at Tewksbury	May-17	4
1549	Reconductor the N-140 115 kV line from Tewksbury to Pinehurst and associated work at Tewksbury	May-17	4
1260	Reconductor the F-158N 115 kV line from Wakefield Junction to Maplewood and associated work at Maplewood	Dec-15	4
1550	Reconductor the F-158S 115 kV line from Maplewood to Everett	Jun-19	4
1551, 1552	Install new 345 kV cable from Woburn to Wakefield Junction, install two new 160 MVAR variable shunt reactors and associated work at Wakefield Junction and Woburn*	Apr-24	3*
1329	Refurbish X-24 69 kV line from Millbury to Northboro Road	Dec-15	4
1327	Reconductor W-23W 69 kV line from Woodside to Northboro Road	Jun-19	4

* Substation portion of the project is a Present Stage status 4

Greater Boston Projects, cont.

Status as of 1/18/2024

Plan Benefit: Addresses long-term system needs in the Greater Boston area and improves system reliability

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1330	Separate X-24 and E-157W DCT	Dec-18	4
1363	Separate Q-169 and F-158N DCT	Dec-15	4
1637, 1640	Reconductor M-139/211-503 and N-140/211-504 115 kV lines from Pinehurst to North Woburn tap	May-17	4
1516	Install new 115 kV station at Sharon to segment three 115 kV lines from West Walpole to Holbrook	Sep-20	4
965	Install third 115 kV line from West Walpole to Holbrook	Sep-20	4
1558	Install new 345 kV breaker in series with the 104 breaker at Stoughton	May-16	4
1199	Install new 230/115 kV autotransformer at Sudbury and loop the 282-602 230 kV line in and out of the new 230 kV switchyard at Sudbury	Dec-17	4
1335	Install a new 115 kV line from Sudbury to Hudson	Mar-25	3

Greater Boston Projects, cont.

Status as of 1/18/2024

Plan Benefit: Addresses long-term system needs in the Greater Boston area and improves system reliability

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1336	Replace 345/115 kV autotransformer, 345 kV breakers, and 115 kV switchgear at Woburn	Dec-19	4
1553	Install a 345 kV breaker in series with breaker 104 at Woburn	Jun-17	4
1337	Reconfigure Waltham by relocating PARs, 282-507 line, and a breaker	Dec-17	4
1339	Upgrade 533-508 115 kV line from Lexington to Hartwell and associated work at the stations	Aug-16	4
1521	Install a new 115 kV 54 MVAR capacitor bank at Newton	Dec-16	4
1522	Install a new 115 kV 36.7 MVAR capacitor bank at Sudbury	May-17	4
1352	Install a second Mystic 345/115 kV autotransformer and reconfigure the bus	May-19	4
1353	Install a 115 kV breaker on the East bus at K Street	Jun-16	4
1354, 1738	Install 115 kV cable from Mystic to Chelsea and upgrade Chelsea 115 kV station to BPS standards	Jul-21	4
1355	Split 110-522 and 240-510 DCT from Baker Street to Needham for a portion of the way and install a 115 kV cable for the rest of the way	Mar-21	4

Greater Boston Projects, cont.

Status as of 1/18/2024

Plan Benefit: Addresses long-term system needs in the Greater Boston area and improves system reliability

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1356	Install a second 115 kV cable from Mystic to Woburn to create a bifurcated 211-514 line	Apr-24	3
1357	Open lines 329-510/511 and 250-516/517 at Mystic and Chatham, respectively. Operate K Street as a normally closed station.	May-19	4
1518	Upgrade Kingston to create a second normally closed 115 kV bus tie and reconfigure the 345 kV switchyard	Mar-19	4
1519	Relocate the Chelsea capacitor bank to the 128-518 termination postion	Dec-16	4

Greater Boston Projects, cont.

Status as of 1/18/2024

Plan Benefit: Addresses long-term system needs in the Greater Boston area and improves system reliability

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1520	Upgrade North Cambridge to mitigate 115 kV 5 and 10 stuck breaker contingencies	Dec-17	4
1643	Install a 200 MVAR STATCOM at Coopers Mills	Nov-18	4
1341, 1645	Install a 115 kV 36.7 MVAR capacitor bank at Hartwell	May-17	4
1646	Install a 345 kV 160 MVAR shunt reactor at K Street	Dec-19	4
1647	Install a 115 kV breaker in series with the 5 breaker at Framingham	Mar-17	4
1554	Install a 115 kV breaker in series with the 29 breaker at K Street	Apr-17	4

SEMA/RI Reliability Projects

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Southeast Massachusetts/Rhode Island area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1714	Construct a new 115 kV GIS switching station (Grand Army) which includes remote terminal station work at Brayton Point and Somerset substations, and the looping in of the E-183E, F-184, X3, and W4 lines	Oct-20	4
1742	Conduct remote terminal station work at the Wampanoag and Pawtucket substations for the new Grand Army GIS switching station	Oct-20	4
1715	Install upgrades at Brayton Point substation which include a new 115 kV breaker, new 345/115 kV transformer, and upgrades to E183E, F184 station equipment	Oct-20	4
1716	Increase clearances on E-183E & F-184 lines between Brayton Point and Grand Army substations	Nov-19	4
1717	Separate the X3/W4 DCT and reconductor the X3 and W4 lines between Somerset and Grand Army substations; reconfigure Y2 and Z1 lines	Nov-19	4

SEMA/RI Reliability Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Southeast Massachusetts/Rhode Island area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1718	Add 115 kV circuit breaker at Robinson Ave substation and re-terminate the Q10 line	Mar-22	4
1719	Install 45.0 MVAR capacitor bank at Berry Street substation	Cancelled*	N/A
1720	Separate the N12/M13 DCT and reconductor the N12 and M13 between Somerset and Bell Rock substations	Mar-27	2
1721	Reconfigure Bell Rock to breaker-and-a-half station, split the M13 line at Bell Rock substation, and terminate 114 line at Bell Rock; install a new breaker in series with N12/D21 tie breaker, upgrade D21 line switch, and install a 37.5 MVAR capacitor	Aug-23	4
1722	Extend the Line 114 from the Dartmouth town line (Eversource-National Grid border) to Bell Rock substation	Dec-25	2
1723	Reconductor L14 and M13 lines from Bell Rock substation to Bates Tap	Cancelled*	N/A

*Cancelled per ISO-NE PAC presentation on August 27, 2020

SEMA/RI Reliability Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Southeast Massachusetts/Rhode Island area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1725	Build a new 115 kV line from Bourne to West Barnstable substations which includes associated terminal work	May-24	3
1726	Separate the 135/122 DCT from West Barnstable to Barnstable substations	Dec-21	4
1727	Retire the Barnstable SPS	Nov-21	4
1728	Build a new 115 kV line from Carver to Kingston substations and add a new Carver terminal	Aug-23	4
1729	Install a new bay position at Kingston substation to accommodate new 115 kV line	Aug-23	4
1730	Extend the 114 line from the Eversource/National Grid border to the Industrial Park Tap	Dec-25	2

SEMA/RI Reliability Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Southeast Massachusetts/Rhode Island area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1731	Install 35.3 MVAR capacitors at High Hill and Wing Lane substations	Dec-21	4
1732	Loop the 201-502 line into the Medway substation to form the 201-502N and 201-502S lines	Dec-25	3
1733	Separate the 325/344 DCT lines from West Medway to West Walpole substations	Cancelled**	N/A
1734	Reconductor and upgrade the 112 Line from the Tremont substation to the Industrial Tap	Jun-18	4
1736	Reconductor the 108 line from Bourne substation to Horse Pond Tap*	Oct-18	4
1737	Replace disconnect switches on 323 line at West Medway substation and replace 8 line structures	Aug-20	4

* Does not include the reconductoring work over the Cape Cod canal

** Cancelled per ISO-NE PAC presentation on August 27, 2020

SEMA/RI Reliability Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Southeast Massachusetts/Rhode Island area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1741	Rebuild the Middleborough Gas and Electric portion of the E1 line from Bridgewater to Middleborough	Apr-19	4
1782	Reconductor the J16S line	May 22	4
1724	Replace the Kent County 345/115 kV transformer	Mar-22	4
1789	West Medway 345 kV circuit breaker upgrades	Apr-21	4
1790	Medway 115 kV circuit breaker replacements	Nov-20	4

Eastern CT Reliability Projects

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Eastern Connecticut area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1815	Reconductor the L190-4 and L190-5 line sections	Dec-24	3
1850	Install a second 345/115 kV autotransformer (4X) and one 345 kV breaker at Card substation	Dec-22	4
1851	Upgrade Card 115 kV to BPS standards	Dec-22	4
1852	Install one 115 kV circuit breaker in series with Card substation 4T	Feb-23	4
1853	Convert Gales Ferry substation from 69 kV to 115 kV	Nov-23	4
1854	Rebuild the 100 Line from Montville to Gales Ferry to allow operation at 115 kV	Jun-23	4

Eastern CT Reliability Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Eastern Connecticut area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1855	Re-terminate the 100 Line at Montville station and associated work. Energize the 100 Line at 115 kV	Jun-23	4
1856	Rebuild 400-1 Line section to allow operation at 115 kV (Tunnel to Ledyard Jct.)	Feb-23	4
1857	Add one 115 kV circuit breaker and re-terminate the 400-1 line section into Tunnel substation. Energize 400 Line at 115 kV	Feb-23	4
1858	Rebuild 400-2 Line section to allow operation at 115 kV (Ledyard Jct. to Border Bus with CMEEC)	Sept-22	4
1859	Rebuild the 400-3 Line Section to allow operation at 115 kV (Gales Ferry to Ledyard Jct.)	Feb-23	4
1860	Install a 25.2 MVAR 115 kV capacitor and one capacitor breaker at Killingly	Dec-21	4

Eastern CT Reliability Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Eastern Connecticut area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1861	Install one 345 kV series breaker with the Montville 1T	Nov-21	4
1862	Install a +55/-29 MVAR synchronous condenser with two 115 kV breakers at Shunock	Dec-23	4
1863	Install a 1% series reactor with bypass switch at Mystic, CT on the 1465 Line	Mar-22	4
1864	Convert the 400-2 Line Section to 115 kV (Border Bus to Buddington)	Feb-23	4
1904	Convert 69 kV equipment at Buddington to 115 kV to facilitate the conversion of the 400-2 line to 115 kV	Dec-23	4

New Hampshire Solution Projects

Status as of 1/18/2024

Project Benefit: Addresses system needs in the New Hampshire area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1878	Install a +55/-32.2 MVAR synchronous condenser at N. Keene 115 kV Substation with a 115 kV breaker	Sep-24	3
1879	Install a +55/-32.2 MVAR synchronous condenser at Huckins Hill 115 kV Substation with a 115 kV breaker	May-24	3
1880	Install a +127/-50 MVAR synchronous condenser at Amherst 345 kV Substation with two 345 kV breakers	Jun-24	3
1881	Install two 50 MVAR capacitors on Line 363 near Seabrook Station with three 345 kV breakers	Oct-23	4

Upper Maine Solution Projects

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Upper Maine area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1882	Rebuild 21.7 miles of the existing 115 kV line Section 80 Highland-Coopers Mills 115 kV line	Dec-24	3
1883	Convert the Highland 115 kV substation to an eight breaker, breaker-and-a-half configuration with a bus connected 115/34.5 kV transformer	Jul-28	1
1884	Install a 15 MVAR capacitor at Belfast 115 kV substation	Jul-28	1
1885	Install a +50/-25 MVAR synchronous condenser at Highland 115 kV substation	Jul-28	1
1886	Install +50/-25 MVAR synchronous condenser at Boggy Brook 115 kV substation, and install a new 115 kV breaker to separate Line 67 from the proposed solution elements	Jun-24	3

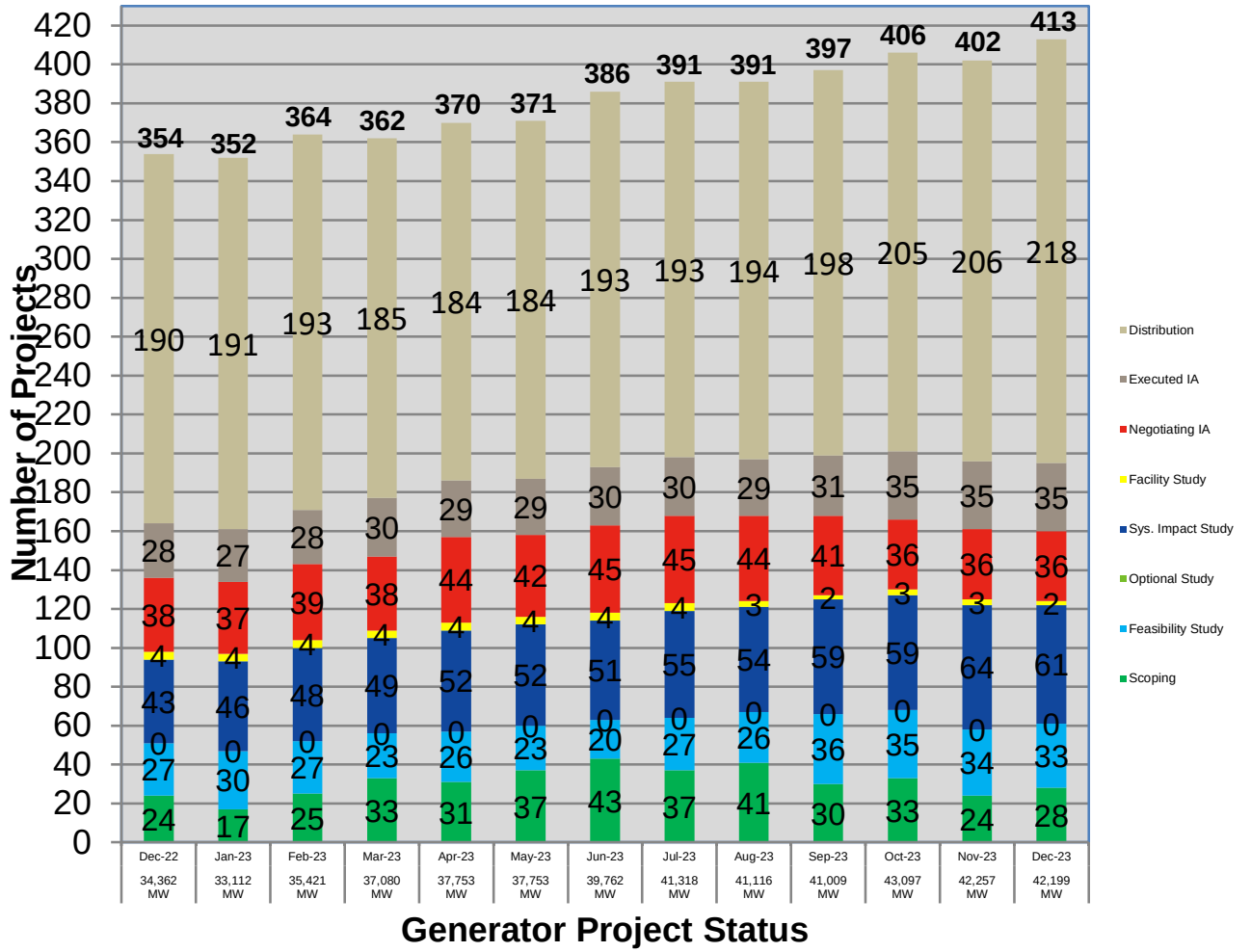
Upper Maine Solution Projects, cont.

Status as of 1/18/2024

Project Benefit: Addresses system needs in the Upper Maine area

RSP Project List ID	Upgrade	Expected/ Actual In-Service	Present Stage
1887	Install 25 MVAR reactor at Boggy Brook 115 kV substation	Jun-24	3
1888	Install 10 MVAR reactor at Keene Road 115 kV substation	Jun-24	3
1889	Install three remotely monitored and controlled switches to split the existing Orrington reactors between the two Orrington 345/115 kV autotransformers	Dec-24	2

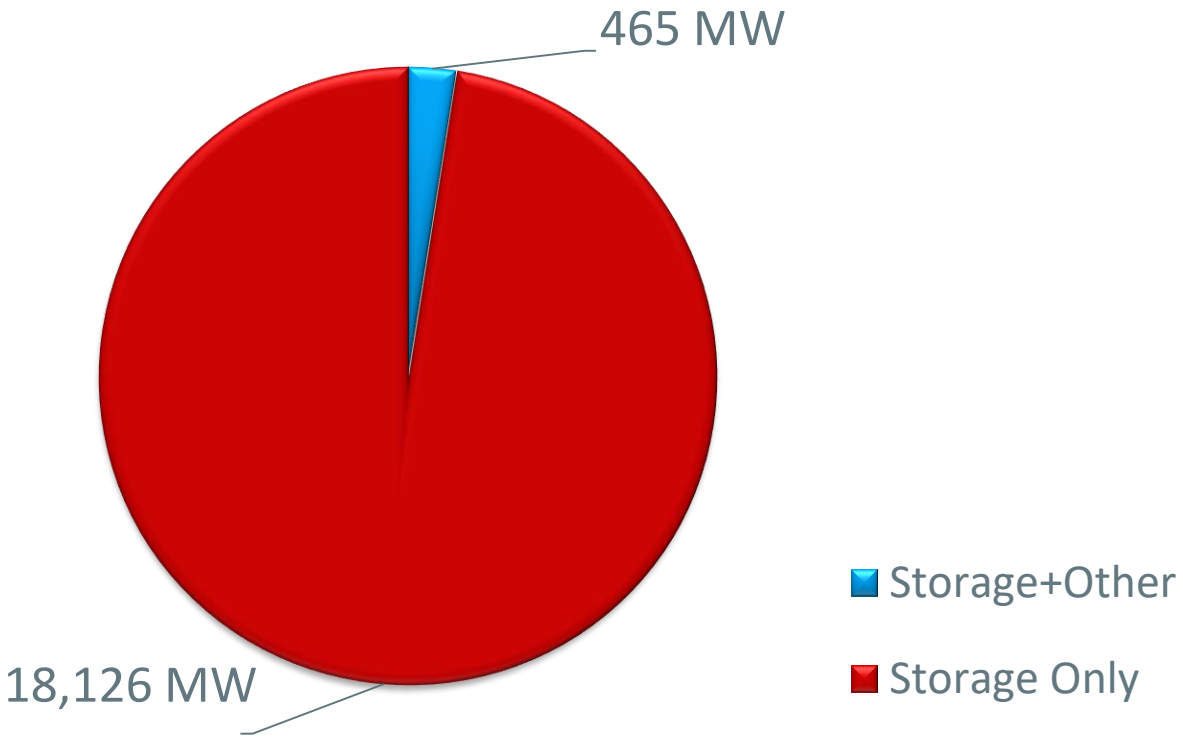
Status of Tariff Studies as of January 1, 2024



8 ETUs in Scoping, 6 in FS, 1 in SIS, 0 in OIS, 0 in FAC, 1 Negotiating IA, and 4 with Executed IA
Transmission Service Requests needing study: 1 in SIS
https://irtt.iso-ne.com/external.aspx

What is in the Queue (as of January 1, 2024)

Storage Projects are proposed as stand-alone storage or as co-located with wind or solar projects



OPERABLE CAPACITY ANALYSIS

Winter 2024 Analysis

Winter 2024 Operable Capacity Analysis

50/50 Load Forecast (Reference)	Feb. - 2024[2] CSO (MW)	Feb. - 2024[2] SCC (MW)
Operable Capacity MW [1]	28,648	31,731
Active Demand Capacity Resource (+) [5]	346	347
External Node Available Net Capacity, CSO imports minus firm capacity exports (+)	869	869
Non Commercial Capacity (+)	20	20
Non Gas-fired Planned Outage MW (-)	202	842
Gas Generator Outages MW (-)	45	237
Allowance for Unplanned Outages (-) [4]	3,100	3,100
Generation at Risk Due to Gas Supply (-) [3]	2,193	2,187
Net Capacity (NET OPCAP SUPPLY MW)	24,343	26,601
Peak Load Forecast MW(adjusted for Other Demand Resources) [2]	19,755	19,755
Operating Reserve Requirement MW	2,305	2,305
Operable Capacity Required (NET LOAD OBLIGATION MW)	22,060	22,060
Operable Capacity Margin	2,283	4,541

1. Operable Capacity is based on data as of **January 23, 2024** and does not include Capacity associated with Settlement Only Generators, Passive and Active Demand Response, and external capacity. The Capacity Supply Obligation (CSO) and Seasonal Claim Capability (SCC) values are based on data as of January 23, 2024.
2. Load forecast that is based on the 2023 CELT report and represents the week with the lowest Operable Capacity Margin, week beginning February 10, 2024.
3. Total of (Gas at Risk MW) – (Gas Gen Outages MW).
4. Allowance For Unplanned Outage MW is based on the month corresponding to the day with the lowest Operable Capacity Margin for the week.
5. Active Demand Capacity Resources (ADCRs) can participate in the Forward Capacity Market (FCM), have the ability to obtain a CSO and also participate in the Day-Ahead and Real-Time Energy Markets.

Winter 2024 Operable Capacity Analysis

90/10 Load Forecast	Feb. - 2024[2] CSO (MW)	Feb. - 2024[2] SCC (MW)
Operable Capacity MW [1]	28,648	31,731
Active Demand Capacity Resource (+) [5]	346	347
External Node Available Net Capacity, CSO imports minus firm capacity exports (+)	869	869
Non Commercial Capacity (+)	20	20
Non Gas-fired Planned Outage MW (-)	202	842
Gas Generator Outages MW (-)	45	237
Allowance for Unplanned Outages (-) [4]	3,100	3,100
Generation at Risk Due to Gas Supply (-) [3]	3,240	3,389
Net Capacity (NET OPCAP SUPPLY MW)	23,296	25,399
Peak Load Forecast MW(adjusted for Other Demand Resources) [2]	20,500	20,500
Operating Reserve Requirement MW	2,305	2,305
Operable Capacity Required (NET LOAD OBLIGATION MW)	22,805	22,805
Operable Capacity Margin	491	2,594

1. Operable Capacity is based on data as of **January 23, 2024** and does not include Capacity associated with Settlement Only Generators, Passive and Active Demand Response, and external capacity. The Capacity Supply Obligation (CSO) and Seasonal Claim Capability (SCC) values are based on data as of January 23, 2024.
2. Load forecast that is based on the 2023 CELT report and represents the week with the lowest Operable Capacity Margin, week beginning February 10, 2024.
3. Total of (Gas at Risk MW) – (Gas Gen Outages MW).
4. Allowance For Unplanned Outage MW is based on the month corresponding to the day with the lowest Operable Capacity Margin for the week.
5. Active Demand Capacity Resources (ADCRs) can participate in the Forward Capacity Market (FCM), have the ability to obtain a CSO and also participate in the Day-Ahead and Real-Time Energy Markets.

Winter 2024 Operable Capacity Analysis

50/50 Forecast (Reference)

ISO-NE OPERABLE CAPACITY ANALYSIS

January 23, 2024 - 50-50 FORECAST using CSO MW

This analysis is a tabulation of weekly assessments shown in one single table. The information shows the operable capacity situation under assumed conditions for each week. It is not expected that the system peak will occur every week in February & March.

Report created: 1/23/2024

Study Week (Week Beginning, Saturday)	CSO Supply Resource Capacity MW	CSO Demand Resource Capacity MW	External Node Capacity MW	Non-Commercial Capacity MW	CSO Non Gas-Only Generator Planned Outages MW	CSO Gas-Only Generator Planned Outages MW	Unplanned Outages Allowance MW	CSO Generation at Risk Due to Gas Supply 50-50PLE MW	CSO Net Available Capacity MW	Peak Load Forecast 50-50PLE MW	Operating Reserve Requirement MW	CSO Net Required Capacity MW	CSO Operable Capacity Margin MW	Season Min Opcap Margin Flag	Season_Label
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2/10/2024	28648	346	869	20	202	45	3100	2193	24343	19755	2305	22060	2283	Y	Winter 2023/2024
2/17/2024	28648	346	869	20	212	0	3100	1788	24783	19495	2305	21800	2983	N	Winter 2023/2024
2/24/2024	28648	346	869	20	347	141	3100	1348	24947	18516	2305	20821	4126	N	Winter 2023/2024
3/2/2024	28349	512	958	201	2263	113	2200	301	25143	18170	2305	20475	4668	N	Winter 2023/2024
3/9/2024	28349	512	958	201	1210	660	2200	0	25950	17976	2305	20281	5669	N	Winter 2023/2024
3/16/2024	28349	512	958	201	1212	566	2200	0	26042	17614	2305	19919	6123	N	Winter 2023/2024
3/23/2024	28349	512	958	201	1752	1388	2200	0	24680	17054	2305	19359	5321	N	Winter 2023/2024
3/30/2024	28247	512	958	201	1802	2361	2700	0	23055	16379	2305	18684	4371	N	Winter 2023/2024

Column Definitions

1. CSO Supply Resource Capacity MW: Summation of all resource Capacity supply Obligations (CSO). Does not include Settlement Only Generators (SOG).

2. CSO Demand Resource Capacity MW: Demand resources known as Real-Time Demand Response (RTDR) will become Active Demand Capacity Resources (ADCRs) and can participate in the Forward Capacity market (FCM). These resources will have the ability to obtain a CSO and also particpate in the Day-Ahead and Real-Time Energy Markets.

3. External Node Capacity MW: Sum of external Capacity Supply Obligations (CSO) imports and exports.

4. Non-Commercial capacity MW: New resources and generator improvements that have acquired a CSO but have not become commercial.

5. CSO Non Gas-Only Generator Planned Outages MW: All Non-Gas Planned Outages is the total of Non Gas-fired Generator/DARD Outages for the period. This value would also include any known long-term Non Gas-fired Forced Outages.Outages.

6. CSO Gas-Only Generator Planned Outages MW: All Planned Gas-fired generation outage for the period. This value would also include any known long-term Gas-fired Forced Outages.

7. Unplanned Outage Allowance MW: Forced Outages and Maintenance Outages scheduled less than 14 days in advance per ISO New England Operating Procedure No. 5 Appendix A.

8. CSO Generation at Risk Due to Gas Supply Mw: Gas fired capacity expected to be at risk during cold weather conditions or gas pipeline maintenance outages.

9. CSO Net Available Capacity MW: the summation of columns (1+2+3+4-5-6-7-8=9)

10. Peak Load Forecast MW: Provided in the annual 2023 CELT Report and adjusted for Passive Demand Resources assumes Peak Load Exposure (PLE) and does include credit of Passive Demand Response (PDR) and behind-the-meter PV (BTM PV).

11. Operating Reserve Requirement MW: 120% of first largest contingency plus 50% of the second largest contingency.

12. CSO Net Required Capacity MW: (Net Load Obligation) (10+11=12)

13. CSO Operable Capacity Margin MW: CSO Net Available Capacity MW minus CSO Net Required Capacity MW (9-12=13)

14. Operable Capacity Season Label: Applicable season and year.

15. Season Minimum Operable Capacity Flag: this column indicates whether or not a week has the lowest capacity margin for its applicable season.

The 50/50 Forecast Operable Capacity Analysis is published daily. To download this chart in Excel, go to the Annual Maintenance Schedule webpage and follow the instructions.

Winter 2024 Operable Capacity Analysis
90/10 Forecast

ISO-NE OPERABLE CAPACITY ANALYSIS

January 23, 2024 - 90/10 FORECAST using CSO MW

This analysis is a tabulation of weekly assessments shown in one single table. The information shows the operable capacity situation under assumed conditions for each week. It is not expected that the system peak will occur every week in February & March.

Report created: 1/23/2024

Study Week (Week Beginning , Saturday)	CSO Supply Resource Capacity MW	CSO Demand Resource Capacity MW	External Node Capacity MW	Non-Commercial Capacity MW	CSO Non Gas-Only Generator Planned Outages MW	CSO Gas-Only Generator Planned Outages MW	Unplanned Outages Allowance MW	CSO Generation at Risk Due to Gas Supply 90-10PLE MW	CSO Net Available Capacity MW	Peak Load Forecast 90-10PLE MW	Operating Reserve Requirement MW	CSO Net Required Capacity MW	CSO Operable Capacity Margin MW	Season Min Opcap Margin Flag	Season_Label
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2/10/2024	28648	346	869	20	202	45	3100	3240	23296	20500	2305	22805	491	Y	Winter 2023/2024
2/17/2024	28648	346	869	20	212	0	3100	2686	23885	20231	2305	22536	1349	N	Winter 2023/2024
2/24/2024	28648	346	869	20	347	141	3100	2096	24199	19218	2305	21523	2676	N	Winter 2023/2024
3/2/2024	28349	512	958	201	2263	113	2200	1198	24246	18860	2305	21165	3081	N	Winter 2023/2024
3/9/2024	28349	512	958	201	1210	660	2200	546	25404	18659	2305	20964	4440	N	Winter 2023/2024
3/16/2024	28349	512	958	201	1212	566	2200	0	26042	18285	2305	20590	5452	N	Winter 2023/2024
3/23/2024	28349	512	958	201	1752	1388	2200	0	24680	17705	2305	20010	4670	N	Winter 2023/2024
3/30/2024	28247	512	958	201	1802	2361	2700	0	23055	17014	2305	19319	3736	N	Winter 2023/2024

Column Definitions

1. CSO Supply Resource Capacity MW: Summation of all resource Capacity supply Obligations (CSO). Does not include Settlement Only Generators (SOG).
2. CSO Demand Resource Capacity MW: Demand resources known as Real-Time Demand Response (RTDR) will become Active Demand Capacity Resources (ADCRs) and can participate in the Forward Capacity market (FCM). These resources will have the ability to obtain a CSO and also particpate in the Day-Ahead and Real-Time Energy Markets.
3. External Node Capacity MW: Sum of external Capacity Supply Obligations (CSO) imports and exports.
4. Non-Commercial capacity MW: New resources and generator improvements that have acquired a CSO but have not become commercial.
5. CSO Non Gas-Only Generator Planned Outages MW: All Non-Gas Planned Outages is the total of Non Gas-fired Generator/DARD Outages for the period. This value would also include any known long-term Non Gas-fired Forced Outages.Outages.
6. CSO Gas-Only Generator Planned Outages MW: All Planned Gas-fired generation outage for the period. This value would also include any known long-term Gas-fired Forced Outages.
7. Unplanned Outage Allowance MW: Forced Outages and Maintenance Outages scheduled less than 14 days in advance per ISO New England Operating Procedure No. 5 Appendix A.
8. CSO Generation at Risk Due to Gas Supply Mw: Gas fired capacity expected to be at risk during cold weather conditions or gas pipeline maintenance outages.
9. CSO Net Available Capacity MW: the summation of columns (1+2+3+4-5-6-7-8=9)
10. Peak Load Forecast MW: Provided in the annual 2023 CELT Report and adjusted for Passive Demand Resources assumes Peak Load Exposure (PLE) and does include credit of Passive Demand Response (PDR) and behind-the-meter PV (BTM PV).
11. Operating Reserve Requirement MW: 120% of first largest contingency plus 50% of the second largest contingency.
12. CSO Net Required Capacity MW: (Net Load Obligation) (10+11=12)
13. CSO Operable Capacity Margin MW: CSO Net Available Capacity MW minus CSO Net Required Capacity MW (9-12=13)
14. Operable Capacity Season Label: Applicable season and year.
15. Season Minimum Operable Capacity Flag: this column indicates whether or not a week has the lowest capacity margin for its applicable season.

Highlighted week is based on the week determined by the 50/50 Load Forecast Reference week

OPERABLE CAPACITY ANALYSIS

Preliminary Spring 2024 Analysis

Preliminary Spring 2024 Operable Capacity Analysis

50/50 Load Forecast (Reference)	May - 2024[2] CSO (MW)	May - 2024[2] SCC (MW)
Operable Capacity MW [1]	28,247	31,731
Active Demand Capacity Resource (+) [5]	512	347
External Node Available Net Capacity, CSO imports minus firm capacity exports (+)	894	894
Non Commercial Capacity (+)	201	201
Non Gas-fired Planned Outage MW (-)	3,140	3,758
Gas Generator Outages MW (-)	1,870	2,282
Allowance for Unplanned Outages (-) [4]	3,400	3,400
Generation at Risk Due to Gas Supply (-) [3]	0	0
Net Capacity (NET OPCAP SUPPLY MW)	21,444	23,733
Peak Load Forecast MW(adjusted for Other Demand Resources) [2]	18,945	18,945
Operating Reserve Requirement MW	2,305	2,305
Operable Capacity Required (NET LOAD OBLIGATION MW)	21,250	21,250
Operable Capacity Margin	194	2,483

1. Operable Capacity is based on data as of **January 23, 2024** and does not include Capacity associated with Settlement Only Generators, Passive and Active Demand Response, and external capacity. The Capacity Supply Obligation (CSO) and Seasonal Claim Capability (SCC) values are based on data as of January 23, 2024.
2. Load forecast that is based on the 2023 CELT report and represents the week with the lowest Operable Capacity Margin, week beginning May 11, 2024.
3. Total of (Gas at Risk MW) – (Gas Gen Outages MW).
4. Allowance For Unplanned Outage MW is based on the month corresponding to the day with the lowest Operable Capacity Margin for the week.
5. Active Demand Capacity Resources (ADCRs) can participate in the Forward Capacity Market (FCM), have the ability to obtain a CSO and also participate in the Day-Ahead and Real-Time Energy Markets.

Preliminary Spring 2024 Operable Capacity Analysis

90/10 Load Forecast	May - 2024[2] CSO (MW)	May - 2024[2] SCC (MW)
Operable Capacity MW [1]	28,247	31,731
Active Demand Capacity Resource (+) [5]	512	347
External Node Available Net Capacity, CSO imports minus firm capacity exports (+)	894	894
Non Commercial Capacity (+)	201	201
Non Gas-fired Planned Outage MW (-)	3,140	3,758
Gas Generator Outages MW (-)	1,870	2,282
Allowance for Unplanned Outages (-) [4]	3,400	3,400
Generation at Risk Due to Gas Supply (-) [3]	0	0
Net Capacity (NET OPCAP SUPPLY MW)	21,444	23,733
Peak Load Forecast MW(adjusted for Other Demand Resources) [2]	20,388	20,388
Operating Reserve Requirement MW	2,305	2,305
Operable Capacity Required (NET LOAD OBLIGATION MW)	22,693	22,693
Operable Capacity Margin	-1,249	1,040

1. Operable Capacity is based on data as of **January 23, 2024** and does not include Capacity associated with Settlement Only Generators, Passive and Active Demand Response, and external capacity. The Capacity Supply Obligation (CSO) and Seasonal Claim Capability (SCC) values are based on data as of January 23, 2024.
2. Load forecast that is based on the 2023 CELT report and represents the week with the lowest Operable Capacity Margin, week beginning May 11, 2024.
3. Total of (Gas at Risk MW) – (Gas Gen Outages MW).
4. Allowance For Unplanned Outage MW is based on the month corresponding to the day with the lowest Operable Capacity Margin for the week.
5. Active Demand Capacity Resources (ADCRs) can participate in the Forward Capacity Market (FCM), have the ability to obtain a CSO and also participate in the Day-Ahead and Real-Time Energy Markets.

Preliminary Spring 2024 Operable Capacity Analysis

50/50 Forecast (Reference)

ISO-NE OPERABLE CAPACITY ANALYSIS

January 23, 2024 - 50-50 FORECAST using CSO MW

This analysis is a tabulation of weekly assessments shown in one single table. The information shows the operable capacity situation under assumed conditions for each week. It is not expected that the system peak will occur every week in April & May.

Report created: 1/23/2024

Study Week (Week Beginning, Saturday)	CSO Supply Resource Capacity MW	CSO Demand Resource Capacity MW	External Node Capacity MW	Non-Commercial Capacity MW	CSO Non Gas-Only Generator Planned Outages MW	CSO Gas-Only Generator Planned Outages MW	Unplanned Outages Allowance MW	CSO Generation at Risk Due to Gas Supply 50-50PLE MW	CSO Net Available Capacity MW	Peak Load Forecast 50-50PLE MW	Operating Reserve Requirement MW	CSO Net Required Capacity MW	CSO Operable Capacity Margin MW	Season Min Opcap Margin Flag	Season_Label
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4/6/2024	28247	512	958	201	2334	3433	2700	0	21451	16130	2305	18435	3016	N	Spring 2024
4/13/2024	28247	512	958	201	2899	3760	2700	0	20559	15625	2305	17930	2629	N	Spring 2024
4/20/2024	28247	512	958	201	2716	2478	2700	0	22024	15362	2305	17667	4357	N	Spring 2024
4/27/2024	28247	512	894	201	3735	1719	3400	0	21000	15336	2305	17641	3359	N	Spring 2024
5/4/2024	28247	512	894	201	2994	2800	3400	0	20660	17972	2305	20277	383	N	Spring 2024
5/11/2024	28247	512	894	201	3140	1870	3400	0	21444	18945	2305	21250	194	Y	Spring 2024
5/18/2024	28247	512	894	201	1672	987	3400	0	23795	19849	2305	22154	1641	N	Spring 2024
5/25/2024	28247	512	894	201	1556	313	3400	0	24585	20841	2305	23146	1439	N	Spring 2024

Column Definitions

1. CSO Supply Resource Capacity MW: Summation of all resource Capacity supply Obligations (CSO). Does not include Settlement Only Generators (SOG).

2. CSO Demand Resource Capacity MW: Demand resources known as Real-Time Demand Response (RTDR) will become Active Demand Capacity Resources (ADCRs) and can participate in the Forward Capacity market (FCM). These resources will have the ability to obtain a CSO and also particpate in the Day-Ahead and Real-Time Energy Markets.

3. External Node Capacity MW: Sum of external Capacity Supply Obligations (CSO) imports and exports.

4. Non-Commercial capacity MW: New resources and generator improvements that have acquired a CSO but have not become commercial.

5. CSO Non Gas-Only Generator Planned Outages MW: All Non-Gas Planned Outages is the total of Non Gas-fired Generator/DARD Outages for the period. This value would also include any known long-term Non Gas-fired Forced Outages.Outages.

6. CSO Gas-Only Generator Planned Outages MW: All Planned Gas-fired generation outage for the period. This value would also include any known long-term Gas-fired Forced Outages.

7. Unplanned Outage Allowance MW: Forced Outages and Maintenance Outages scheduled less than 14 days in advance per ISO New England Operating Procedure No. 5 Appendix A.

8. CSO Generation at Risk Due to Gas Supply Mw: Gas fired capacity expected to be at risk during cold weather conditions or gas pipeline maintenance outages.

9. CSO Net Available Capacity MW: the summation of columns (1+2+3+4-5-6-7-8=9)

10. Peak Load Forecast MW: Provided in the annual 2023 CELT Report and adjusted for Passive Demand Resources assumes Peak Load Exposure (PLE) and does include credit of Passive Demand Response (PDR) and behind-the-meter PV (BTM PV).

11. Operating Reserve Requirement MW: 120% of first largest contingency plus 50% of the second largest contingency.

12. CSO Net Required Capacity MW: (Net Load Obligation) (10+11=12)

13. CSO Operable Capacity Margin MW: CSO Net Available Capacity MW minus CSO Net Required Capacity MW (9-12=13)

14. Operable Capacity Season Label: Applicable season and year.

15. Season Minimum Operable Capacity Flag: this column indicates whether or not a week has the lowest capacity margin for its applicable season.

The 50/50 Forecast Operable Capacity Analysis is published daily. To download this chart in Excel, go to the Annual Maintenance Schedule webpage and follow the instructions.

Preliminary Spring 2024 Operable Capacity Analysis
90/10 Forecast

ISO-NE OPERABLE CAPACITY ANALYSIS

January 23, 2024 - 90/10 FORECAST using CSO MW

This analysis is a tabulation of weekly assessments shown in one single table. The information shows the operable capacity situation under assumed conditions for each week. It is not expected that the system peak will occur every week in April & May.

Report created: 1/23/2024

Study Week (Week Beginning , Saturday)	CSO Supply Resource Capacity MW	CSO Demand Resource Capacity MW	External Node Capacity MW	Non-Commercial Capacity MW	CSO Non Gas-Only Generator Planned Outages MW	CSO Gas-Only Generator Planned Outages MW	Unplanned Outages Allowance MW	CSO Generation at Risk Due to Gas Supply 90-10PLE MW	CSO Net Available Capacity MW	Peak Load Forecast 90-10PLE MW	Operating Reserve Requirement MW	CSO Net Required Capacity MW	CSO Operable Capacity Margin MW	Season Min Opcap Margin Flag	Season_Label
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4/6/2024	28247	512	958	201	2334	3433	2700	0	21451	16756	2305	19061	2390	N	Spring 2024
4/13/2024	28247	512	958	201	2899	3760	2700	0	20559	16233	2305	18538	2021	N	Spring 2024
4/20/2024	28247	512	958	201	2716	2478	2700	0	22024	15962	2305	18267	3757	N	Spring 2024
4/27/2024	28247	512	894	201	3735	1719	3400	0	21000	15934	2305	18239	2761	N	Spring 2024
5/4/2024	28247	512	894	201	2994	2800	3400	0	20660	19351	2305	21656	-996	N	Spring 2024
5/11/2024	28247	512	894	201	3140	1870	3400	0	21444	20388	2305	22693	-1249	Y	Spring 2024
5/18/2024	28247	512	894	201	1672	987	3400	0	23795	21351	2305	23656	139	N	Spring 2024
5/25/2024	28247	512	894	201	1556	313	3400	0	24585	22409	2305	24714	-129	N	Spring 2024

Column Definitions

1. CSO Supply Resource Capacity MW: Summation of all resource Capacity supply Obligations (CSO). Does not include Settlement Only Generators (SOG).
2. CSO Demand Resource Capacity MW: Demand resources known as Real-Time Demand Response (RTDR) will become Active Demand Capacity Resources (ADCRs) and can participate in the Forward Capacity market (FCM). These resources will have the ability to obtain a CSO and also particpate in the Day-Ahead and Real-Time Energy Markets.
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14. Operable Capacity Season Label: Applicable season and year.
15. Season Minimum Operable Capacity Flag: this column indicates whether or not a week has the lowest capacity margin for its applicable season.

Highlighted week is based on the week determined by the 50/50 Load Forecast Reference week

Possible Relief Under OP4: Appendix A

OP 4 Action Number	Page 1 of 2 Action Description	Amount Assumed Obtainable Under OP 4 (MW)
1	Implement Power Caution and advise Resources with a CSO to prepare to provide capacity and notify "Settlement Only" generators with a CSO to monitor reserve pricing to meet those obligations. Begin to allow the depletion of 30-minute reserve.	0 [1] 600
2	Declare Energy Emergency Alert (EEA) Level 1[4]	0
3	Voluntary Load Curtailment of Market Participants' facilities.	40 [2]
4	Implement Power Watch	0
5	Schedule Emergency Energy Transactions and arrange to purchase Control Area-to-Control Area Emergency	1,000
6	Voltage Reduction requiring > 10 minutes	125 [3]

1. Based on Summer Ratings. Assumes 25% of total MW Settlement Only resources <5 MW will be available and respond.
2. The actual load relief obtained is highly dependent on circumstances surrounding the appeals, including timing and the amount of advanced notice that can be given.
3. The MW values are based on a 25,000 MW system load and verified by the most recent voltage reduction test.
4. EEA Levels are described in Attachment 1 to NERC Reliability Standard EOP-011 - Emergency Operations

Possible Relief Under OP4: Appendix A

OP 4 Action Number	Page 2 of 2 Action Description	Amount Assumed Obtainable Under OP 4 (MW)
7	Request generating resources not subject to a Capacity Supply Obligation to voluntary provide energy for reliability purposes	0
8	5% Voltage Reduction requiring 10 minutes or less	250 [3]
9	Transmission Customer Generation Not Contractually Available to Market Participants during a Capacity Deficiency. Voluntary Load Curtailment by Large Industrial and Commercial Customers.	5 200 [2]
10	Radio and TV Appeals for Voluntary Load Curtailment Implement Power Warning	200 [2]
11	Request State Governors to Reinforce Power Warning Appeals.	100 [2]
Total		**2,520**

1. Based on Summer Ratings. Assumes 25% of total MW Settlement Only resources <5 MW will be available and respond.
2. The actual load relief obtained is highly dependent on circumstances surrounding the appeals, including timing and the amount of advanced notice that can be given.
3. The MW values are based on a 25,000 MW system load and verified by the most recent voltage reduction test.
4. EEA Levels are described in Attachment 1 to NERC Reliability Standard EOP-011 - Emergency Operations