

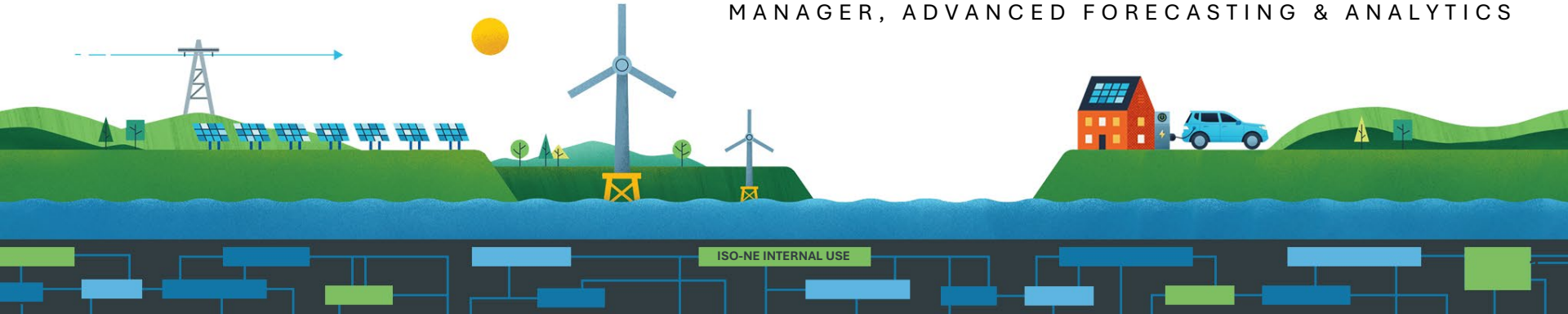


2025 Forecast Performance

Load Forecast Committee

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MANAGER, ADVANCED FORECASTING & ANALYTICS



Objectives

- Share results of analysis of weather, preliminary load, and CELT 2025 forecast performance during the first 8 months of the year



2025 WEATHER & LOAD OVERVIEW

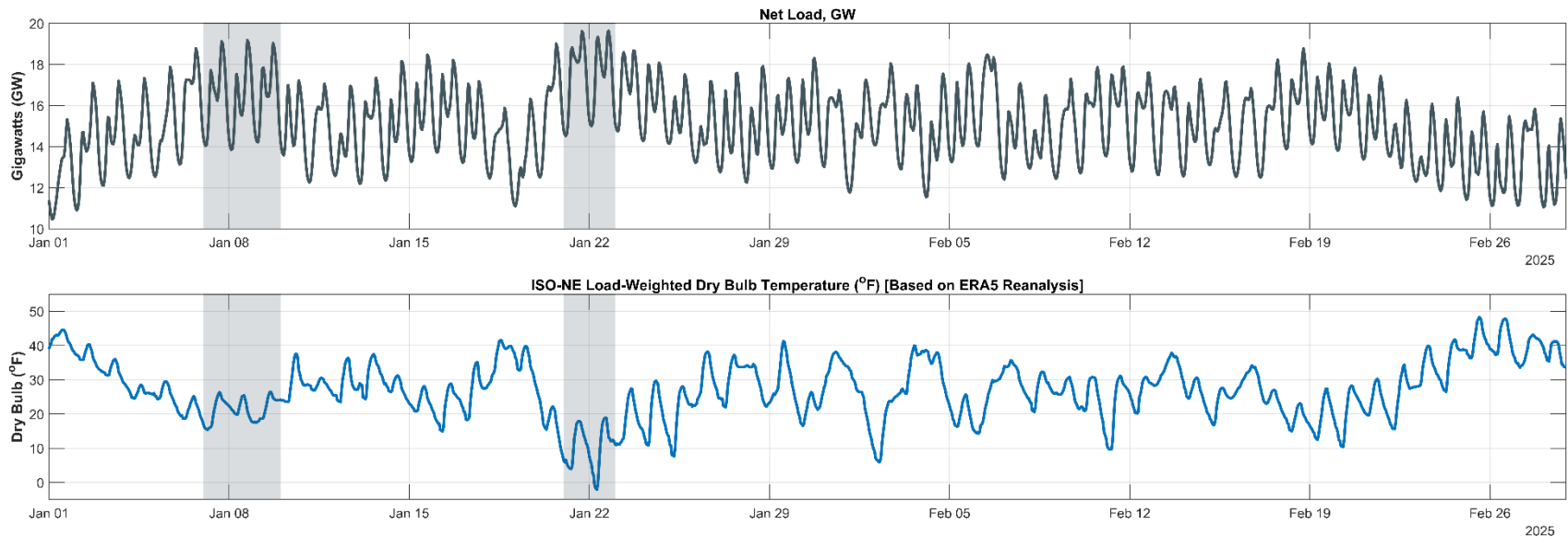


Weather & Load Overview

- ISO compiled and analyzed all weather and load data for the first eight months of 2025 (1/1/2025-8/31/2025)
 - Reminder that ISO switched to using ERA5 reanalysis weather as the ongoing source of historical weather data
 - Load data are preliminary and subject to reconciliation
- This analysis period contained moderate peak load weather conditions during the winter, and more extreme peak load weather during the summer

2025 Winter Weather and Net Load

- Plot below illustrates January/February 2025 net load (top) and weather (bottom)
 - The highest 5 winter peaks (gray shaded areas) occurred January 7-9 and January 21-22



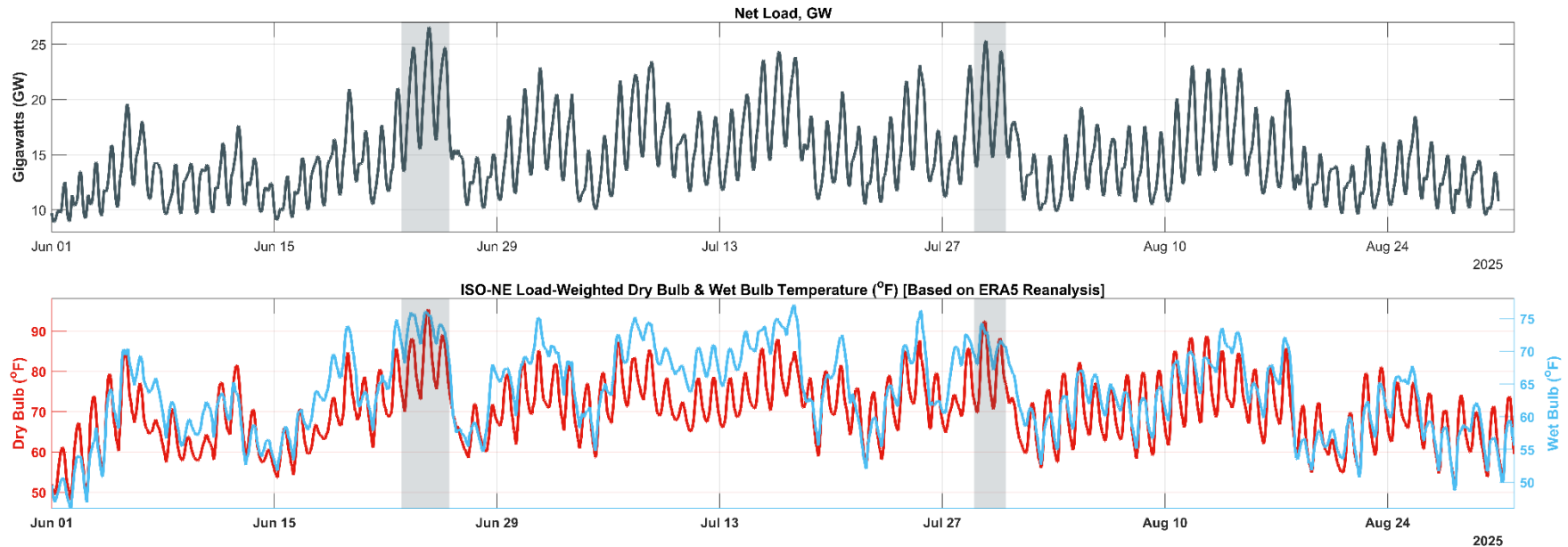
Winter 2024/2025 Weather

- Winter 2024/2025 was steadily cold, and based on total seasonal heating degree days (HDDs), it was the coldest since 2014/2015
- Colder winter weather provided an opportunity to observe the demand and energy implications of cumulative heat pump (HP) and electric vehicle (EV) adoption over the last several years

Winter Heating Degree Days					
ISONE Load-Weighted (Base Point = 55°F)					
Winter Start Year	2014	604	973	1074	2651
	2024	697	896	756	2348
	2017	844	892	551	2286
	2018	667	876	719	2261
	2021	560	942	672	2175
	2020	634	793	732	2159
	2019	694	685	635	2015
	2016	698	687	592	1978
	2023	509	751	627	1887
	2022	627	596	623	1846
	2015	384	774	667	1824
Dec		Jan	Feb	Total Winter HDDs	

2025 Summer Weather and Net Load

- Plot below illustrates summer 2025 net load (top) and weather (bottom)
 - The highest 5 summer peaks (gray shaded areas) occurred June 23-25 and July 29-30
 - June 24th weather was one of the most hot/humid days in recent decades



2025 FORECAST PERFORMANCE



Introduction

- Hourly forecast modeling enables deeper evaluation of forecast performance than the pre-existing peak-only forecast
 - Provides better feedback about forecast performance and the associated linkages with causal factors driving load changes
- ISO analyzed the performance of CELT 2025 modeled load given the observed weather during the first eight months of 2025 and preliminary metered net loads
 - Net Load = Base load + EV + HP – BTM PV
 - Therefore, backcast values include estimated EV and HP hourly loads are based on 2025 incremental monthly adoption forecast

Hourly Mean Absolute Percent Error (MAPE)

Net Load, Non-Holiday Weekdays Only

- The heatmap below illustrates MAPE for each month-hour bin for non-holiday weekdays during the first 8 months of 2025
 - While overall forecast performance is 2.14% MAPE for all hours, there is less accuracy during overnight/early morning hours in winter months

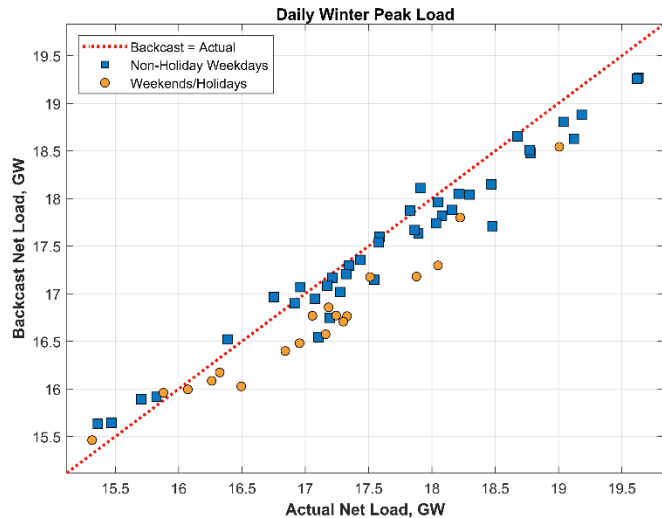
ISON: MAPE = 2.14% (all hours)

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg
Jan-2025	4.71	4.98	4.98	4.93	4.91	4.42	3.51	3.32	3.25	2.87	2.48	2.33	2.47	2.32	2.16	2.25	1.96	1.32	1.28	1.67	2.29	2.72	3.52	4.28	3.12
Feb-2025	4.29	4.47	4.48	4.41	4.32	3.67	2.54	1.94	1.91	2.07	1.95	2.11	2.06	2.04	2.09	2.1	1.7	1.4	1.05	1.34	1.65	1.96	2.69	3.45	2.57
Mar-2025	2.58	2.49	2.43	2.42	2.44	2.37	2.68	1.6	1.41	1.38	1.41	1.64	1.52	1.57	1.81	2.07	1.81	1.78	1.52	1.42	1.46	1.42	2.25	1.63	1.88
Apr-2025	1.83	1.94	2.02	2.04	1.98	2.14	2.23	1.99	1.43	1.23	1.11	1.16	1.43	1.38	1.33	1.74	1.6	1.99	1.57	1.5	1.58	1.5	1.27	1.45	1.64
May-2025	1.18	1.25	1.22	1.21	1.18	1.2	1.1	1.2	1.26	1.47	1.67	1.63	1.68	1.97	1.63	1.63	1.43	1.1	1.18	1.3	1.46	1.19	1	1.19	1.35
Jun-2025	2.31	2.32	2.3	2.5	2.2	2.06	1.97	2.13	1.86	1.89	2.01	2.07	2.14	2.23	2.5	2.49	2.54	2.47	2.3	2.07	1.93	2.03	1.79	1.62	2.16
Jul-2025	2.84	2.81	2.55	2.49	2.41	1.84	1.53	1.53	1.41	1.78	1.92	2.54	2.74	3	3.15	3.22	3.42	2.97	2.65	2.24	2.15	1.88	1.87	2.04	2.37
Aug-2025	2.53	2.3	2.2	2.17	2.05	1.71	1.5	1.62	1.65	1.42	1.45	1.87	2.25	2.55	2.61	2.72	2.65	2.37	2.25	1.87	1.74	1.68	1.73	1.69	2.03



Winter Peak Load: Jan-Feb 2025

- Mean absolute percent error (MAPE)
 - Highest 5 peaks: 1.81% (all backcast values lower than actual)
 - All non-holiday weekdays: 1.25%
 - All weekend days & holidays: 2.28%



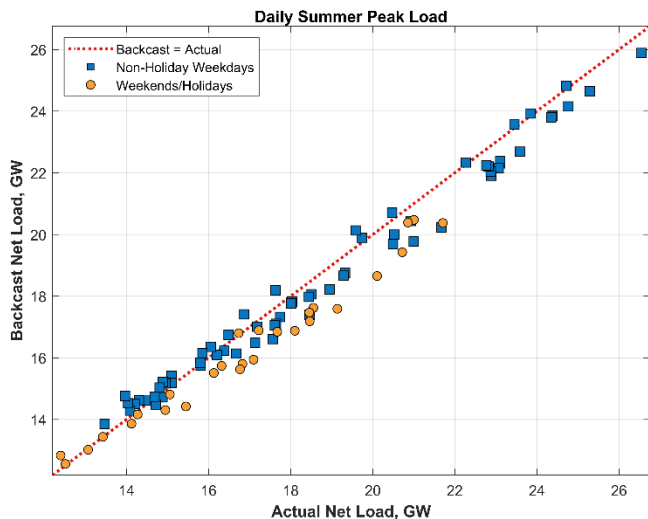
Forecast & Actual Winter Peaks

Day	Day of Week	Gross Load, MW (Estimated)	Net Load, MW	BTMPV Peak Reduction, MW (Estimated)	Peak Hour Ending (Gross/Net)
50/50 Peak (2025/2026)	-	20,056	20,056	0	-
90/10 Peak (2025/2026)	-	21,125	21,125	0	-
1/22/2025	Wed	19,631	19,631	0	19/19
1/21/2025	Tue	19,620	19,620	0	18/18
1/8/2025	Wed	19,183	19,183	0	18/18
1/7/2025	Tue	19,121	19,121	0	18/18
1/9/2025	Thu	19,039	19,039	0	18/18

Note: Observed peak values are from winter 2024/2025

Summer Peak Load

- Mean absolute percent error (MAPE)
 - Highest 5 peaks: 2.03% (most backcast values lower than actual)
 - All non-holiday weekdays: 2.44%
 - All weekend days & holidays: 4.08%



Forecast & Actual Summer Peaks, 2025

Day	Day of Week	Gross Load, MW (Estimated)	Net Load, MW	BTM PV Peak Reduction, MW (Estimated)	Peak Hour Ending (Gross/Net)
50/50 Peak (2025)	-	26,539	24,803	1,736	-
90/10 Peak (2025)	-	27,828	25,886	1,942	-
6/24/2025	Tue	28,509	26,551	1,958	16/18
7/29/2025	Tue	27,175	25,295	1,880	16/19
6/23/2025	Mon	26,320	24,767	1,553	16/19
6/25/2025	Wed	26,757	24,715	2,043	15/19
7/30/2025	Wed	26,276	24,383	1,893	16/17

Findings

- Analysis of 2025 forecast performance indicates a tendency to under-forecast seasonal peaks, and accuracy issues during winter morning hours
 - Potential refinements to base load modeling should be considered as part of the 2026 forecast cycle
- ISO has initiated this work along with the typical updates to input data used in modeling
 - Results will be discussed with the LFC in the coming months

Questions



Acronyms

ADR	Active Demand Response	HP	Heat pump
BTMPV	Behind the meter photovoltaic	HSB	Hybrid-battery storage
CELT	Capacity, Energy, Load, and Transmission	LFC	Load Forecast Committee
DB	Dry bulb temperature	MAPE	Mean absolute percent error
DER	Distributed energy resource	ME	Mean error
EV	Electric Vehicle	SAE	Statistically-adjusted end-use
HDD	Heating Degree Days	WB	Wet bulb temperature