

Draft 2025 Electric Vehicle Forecast



Load Forecast Committee

Victoria Rojo

SUPERVISOR, LOAD FORECASTING
SYSTEM PLANNING



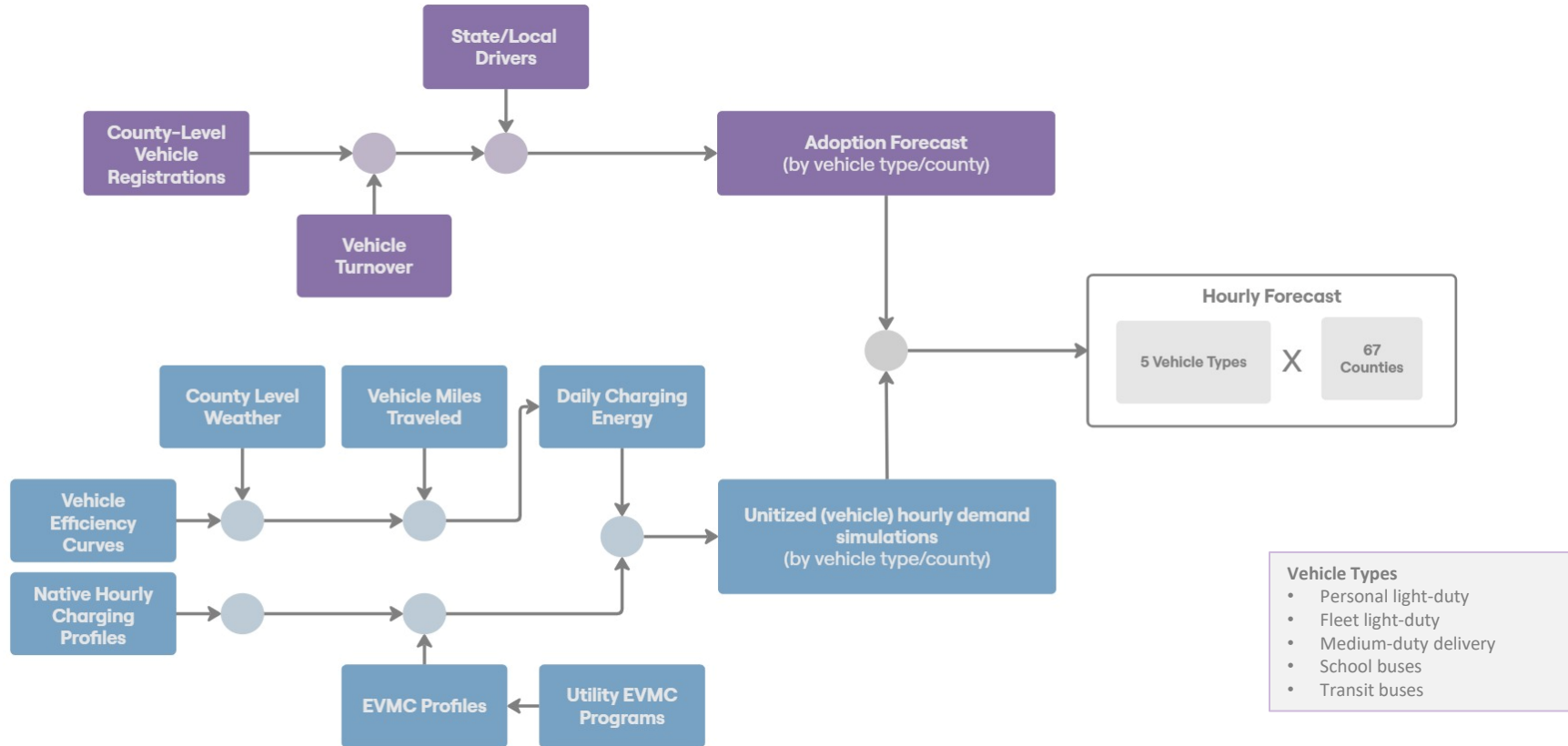
Acronyms

BTM PV	Behind-the-meter Photovoltaic	EVMC	Electric Vehicle Managed Charging
BEV	Battery Electric Vehicle	LDV	Light-Duty Vehicle
CELT	Capacity, Energy, Load, and Transmission	LFC	Load Forecast Committee
DER	Distributed energy resource	MHD	Medium/Heavy Duty
EPRI	Electric Power Research Institute	PHEV	Plugin Hybrid Electric Vehicle
EV	Electric Vehicle	PV	Photovoltaic
		VMT	Vehicle Miles Traveled

Introduction

- The methodology used to model and forecast electric vehicles (EVs) remains relatively unchanged from the prior forecast cycle
 - Prior to CELT 2025 the EV forecast produced hourly results at the state level
 - Full set of hourly results could not be used prior to CELT 2025 since the gross load forecast only modeled peaks
 - Peak modeling utilized an assumed window of summer and winter peak hours
 - See the [CELT 2024 Electric Vehicle Forecast](#) for further methodology details
- For CELT 2025 the EV forecast consists of hourly forecasts, with accounting at the county level, reflecting climate adjusted weather
 - The same climate scenario will be used to simulate the base load and each electrification forecast over the 70+ year simulation period, as discussed on slide 11 of the [Update to Forecast Data Sources presentation](#)
 - Peak demand impacts are determined from the compilation of the gross and net load forecasts

Electric Vehicle Forecast Process



Update to EV Adoption Modeling

- In the absence of comprehensive EV adoption data, previous EV adoption forecasts relied heavily on state and local policy objectives
 - Initial EV adoption data reviewed for CELT 2024 indicated our personal light-duty EV adoption forecast was too high
 - The CELT 2024 forecast incorporated reductions in personal light-duty EV adoption
 - Recently compiled EV adoption data for the last few years has shown that our EV adoption forecast across all vehicle types remains too high, and is out of sync with recent adoption trends
- EV adoption forecasts for CELT 2025
 - Revised adoption profiles have been calibrated to recent EV adoption rates in each state
 - Going forward, EV adoption trends will be recalibrated each year to observed EV adoption trends
 - Adoption forecasts across all vehicle categories have been reduced relative the previous CELT forecast
 - Consistent EV adoption rates that fall below CELT forecasts
 - Increased uncertainty in policy surrounding EV adoption and funding to support infrastructure buildout

Update to EV Managed Charging

- Phase-in of electric vehicle managed charging (EVMC) participation begins at 2% in year 1 of the forecast and continues to increase at a rate of 1% per year
 - This is consistent with the participation rates used in the CELT 2024 forecast
 - Consideration of state-specific EVMC participation rates will continue to be investigated for future forecast cycles, as more data become available to support such assumptions
- No change to regional EVMC profile
 - No significant updates to regional EVMC programs since CELT 2024
 - Pilot programs for fleets are underway or are expected to be launched over the next year in CT and MA
 - Dockets to expand managed charging to additional service territories in the region are ongoing
 - Rhode Island Energy has launched an event-based Electric Vehicle Demand Response program that targets summer peak events between the hours of 3 pm – 8 pm

DRAFT EV ADOPTION FORECAST



EV Adoption Benchmarking for CELT 2024

*Incremental Growth in EVs from Q3 2023 to Q3 2024**

- EV adoption in the CELT 2024 forecast was mostly higher than actual values
 - Actual adoption figures listed below measure adoption from Q3 of 2023 to Q3 of 2024, likely resulting in slight undercounting of EV adoption across the calendar year. However, figures are assumed to be indicative of annual growth.
- EV adoption projections across all vehicle categories have been revised downward for the CELT 2025 forecast

State Growth in Personal Light-Duty EVs							
	NE	CT	MA	ME	NH	RI	VT
Actual†	63,445	14,666	30,991	4,670	4,833	3,513	4,772
CELT 2024	109,338	23,074	61,269	9,218	4,801	6,090	4,886
Difference	45,893	8,408	30,278	4,548	-32	2,577	114

State Growth in Fleet Light-Duty EVs							
	NE	CT	MA	ME	NH	RI	VT
Actual†	3,503	499	1,734	252	423	297	298
CELT 2024	9,698	782	7,175	1,002	345	228	228
Difference	6,195	283	5,441	750	-78	-69	-70

New England Growth in MHD EVs			
	School Bus ‡	Transit Bus†	Medium Duty Delivery
Actual	91	16	0
CELT 2024	300	38	100
Difference	209	22	100

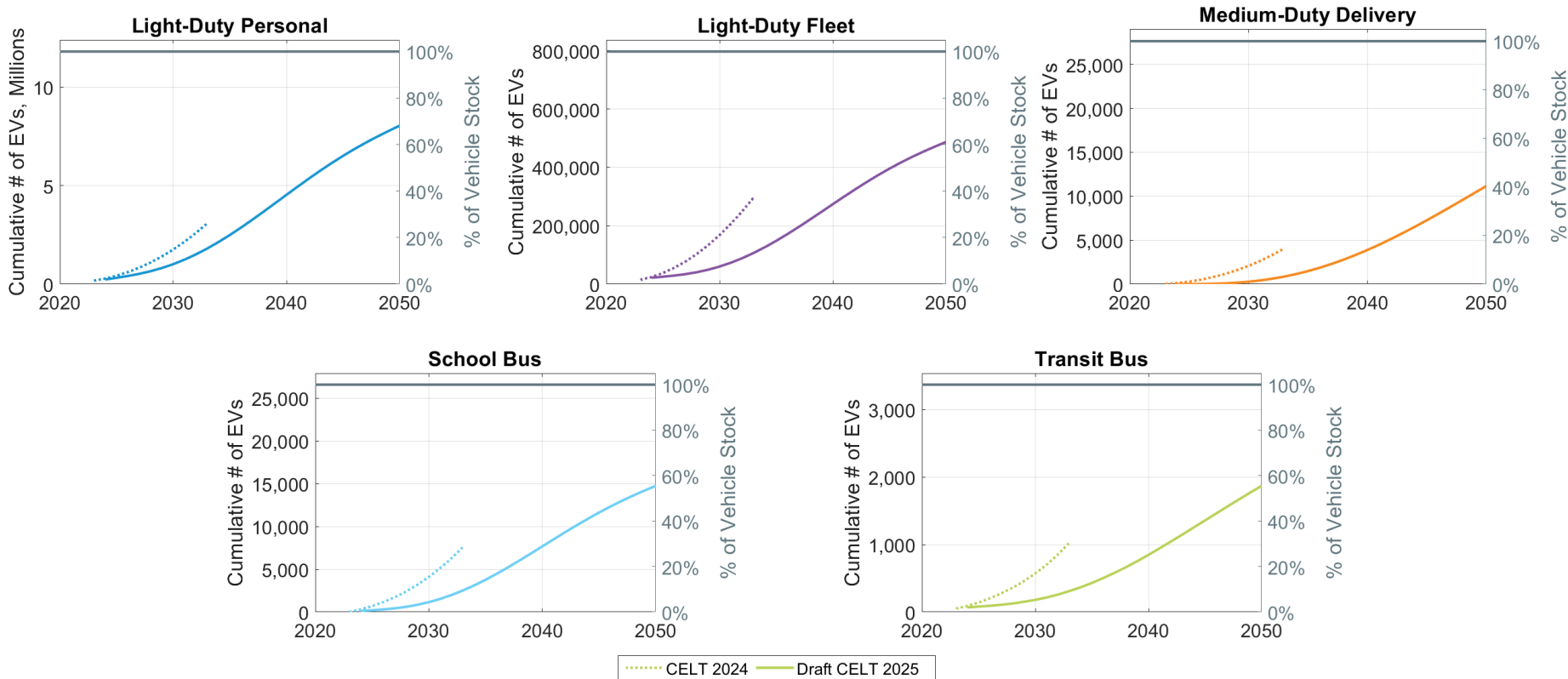
* All “actual” figures are preliminary and subject to change.

† Source: Experian Information Solutions, Inc.

‡ Source: World Resources Institute

Draft 2025 EV Adoption Forecast

Cumulative EV Stock for New England



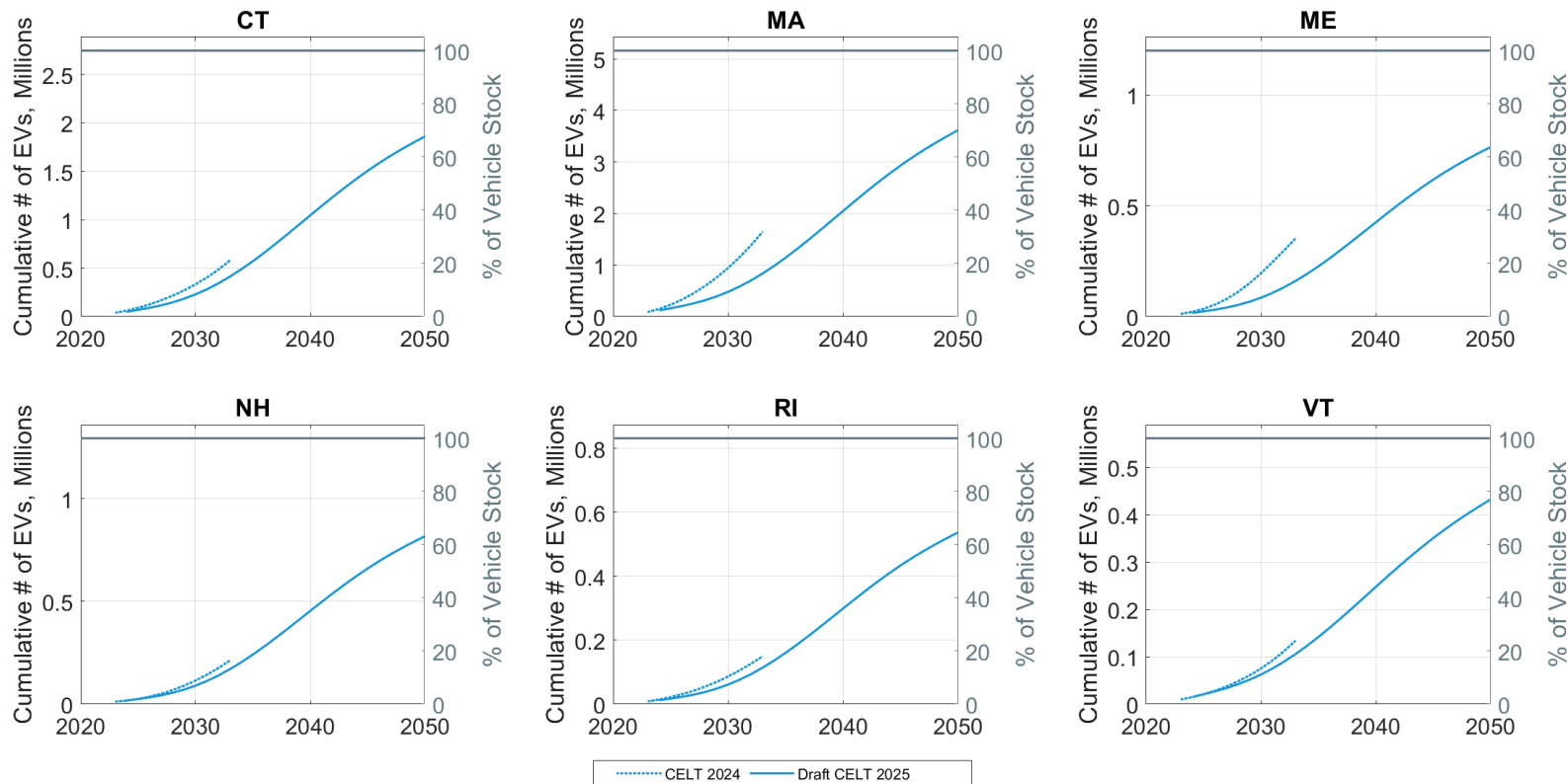
Draft 2025 EV Adoption Forecast

Annual Incremental Increase in EV Stock for New England

Year	Personal Light-Duty	Fleet Light-Duty	Medium Duty Delivery	School Bus	Transit Bus
2025	86,863	3,484	2	83	12
2026	92,872	3,890	9	95	12
2027	108,981	4,979	24	128	15
2028	132,813	6,589	44	178	19
2029	162,185	8,575	76	238	25
2030	195,115	10,800	110	307	29
2031	229,813	13,144	150	380	35
2032	264,683	15,501	195	455	43
2033	298,327	17,776	240	527	51
2034	329,543	19,884	289	597	57
10-year total (2025-2034)	1,901,195	104,622	1,139	2,988	298
EV % of Vehicle Stock 2024 (Actual)	1.9%	2.7%	0.0%	0.6%	2.0%
EV % of Vehicle Stock 2034 (Forecast)	18.1%	15.8%	4.1%	11.7%	10.9%

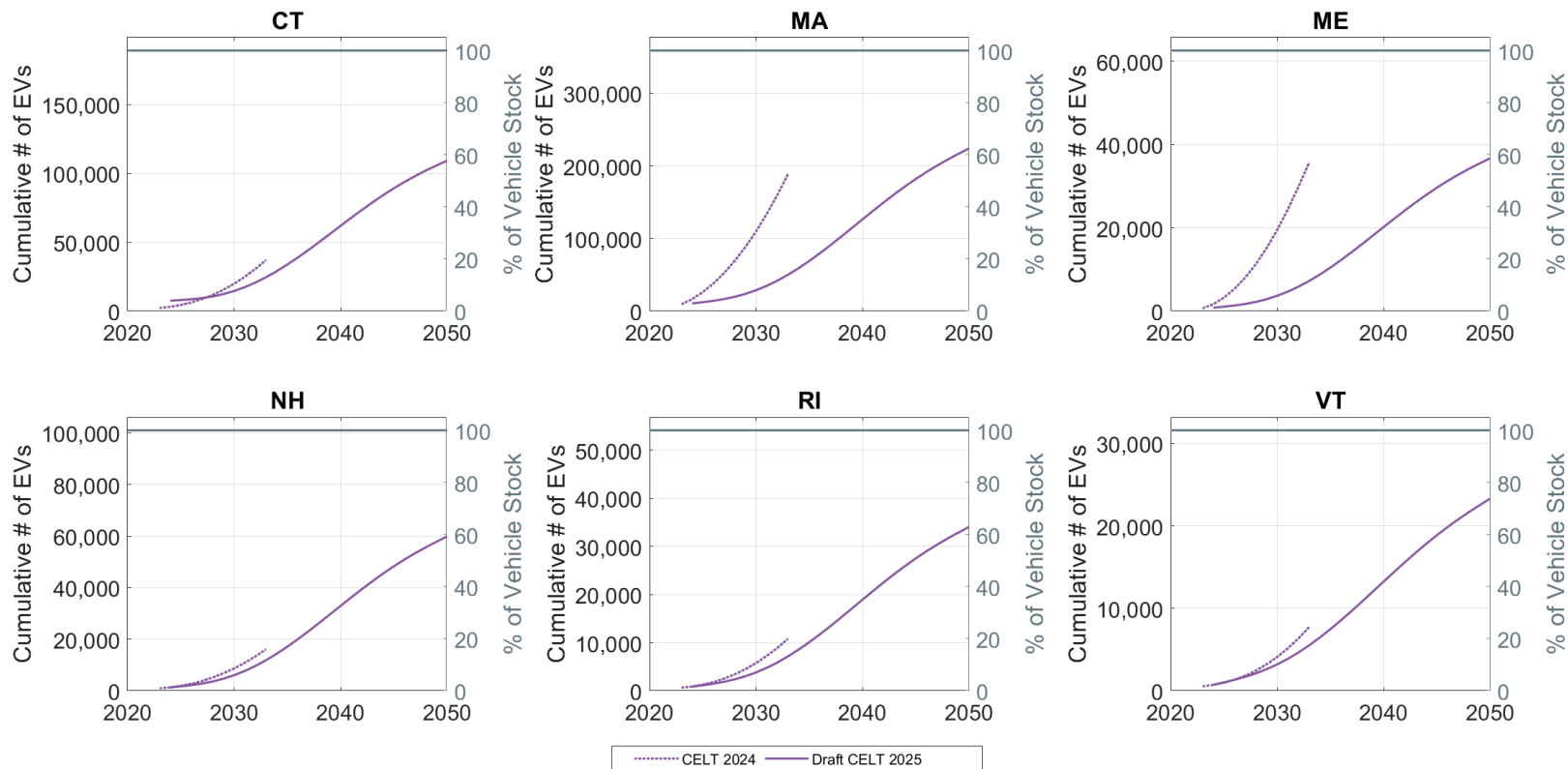
Personal Light-Duty Vehicles

Draft 2025 Cumulative EV Adoption Forecast



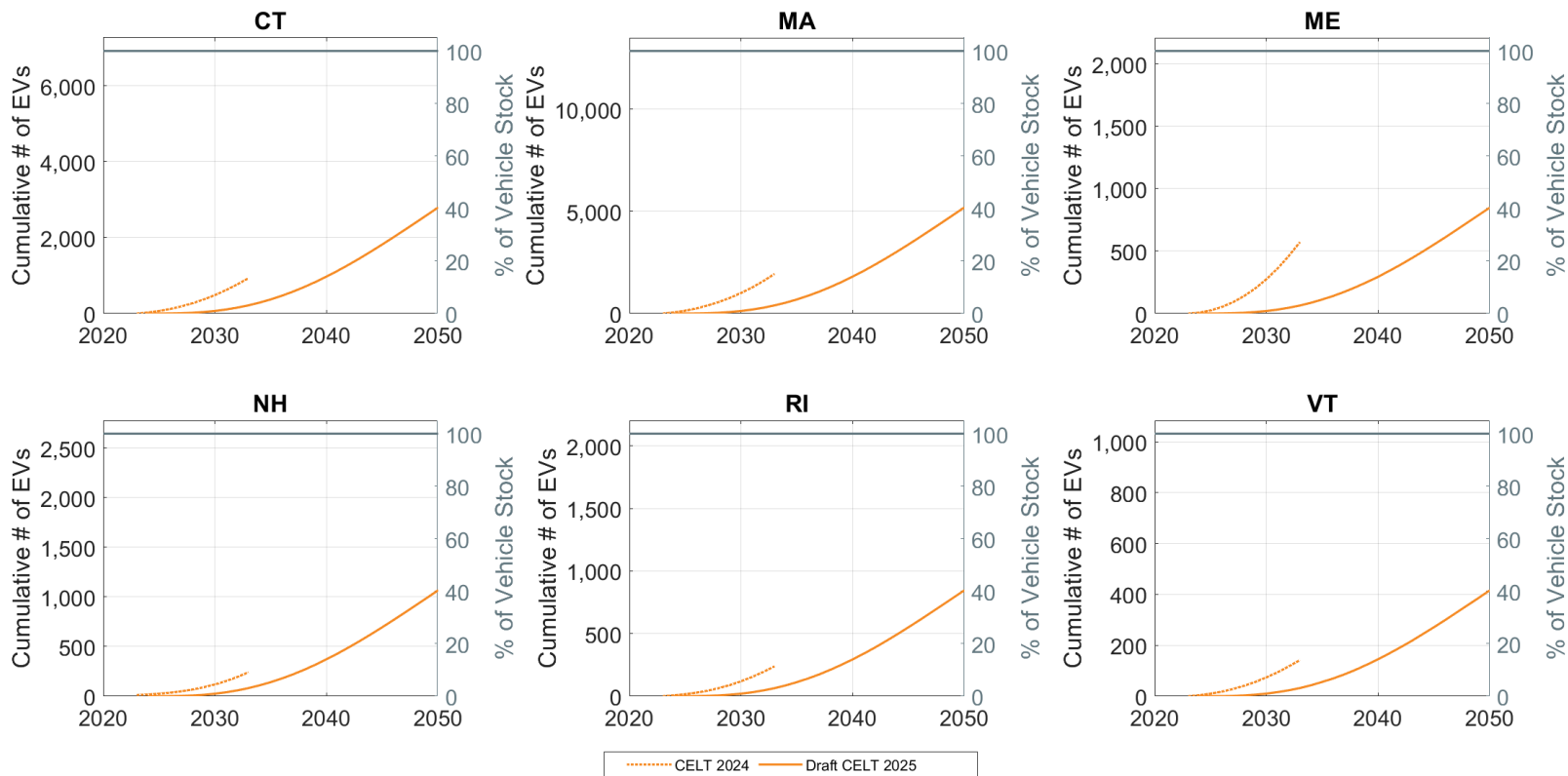
Fleet Light-Duty Vehicles

Draft 2025 Cumulative EV Adoption Forecast



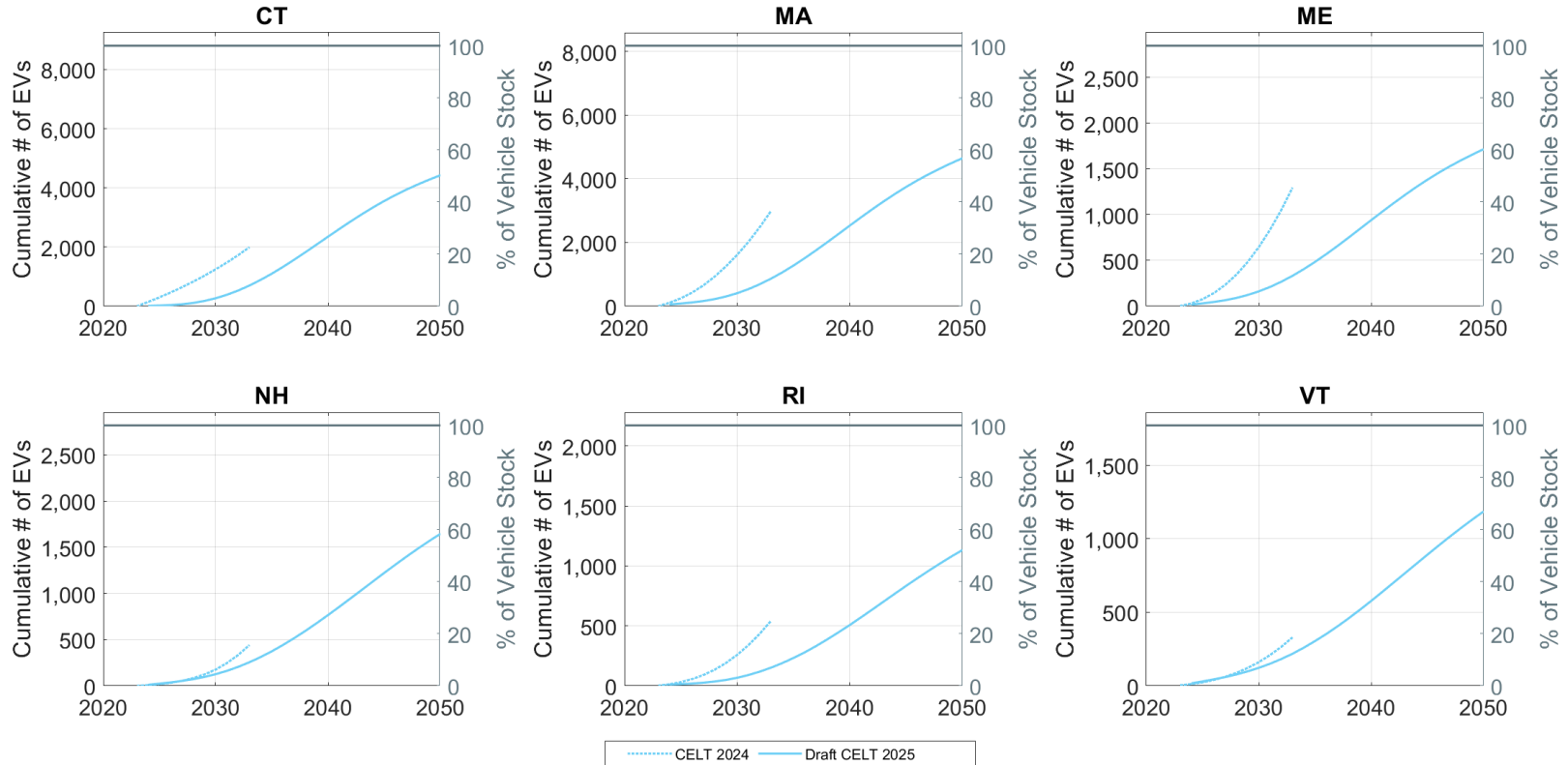
Medium-Duty Delivery Vehicles

Draft 2025 Cumulative EV Adoption Forecast



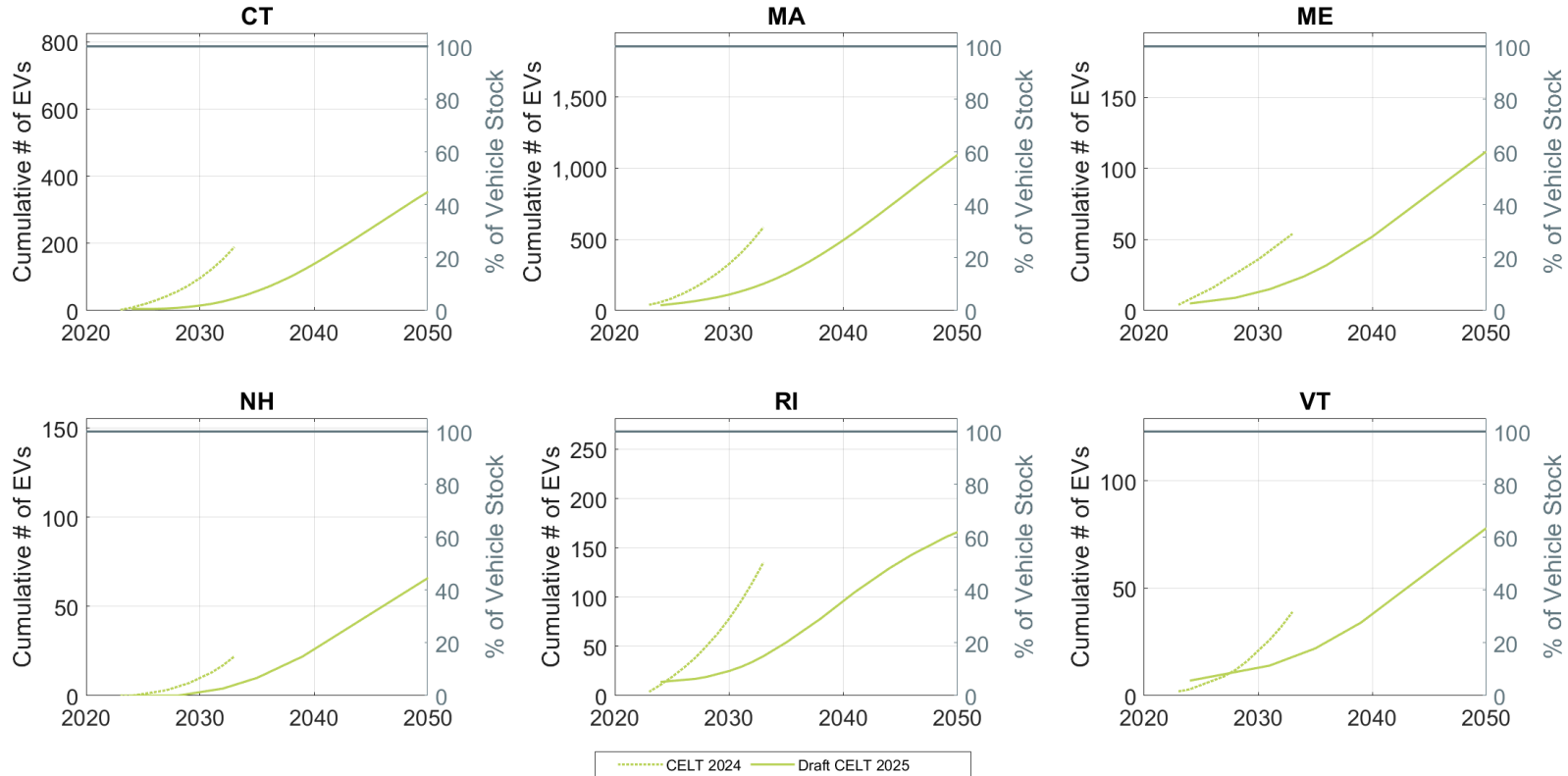
School Buses

Draft 2025 Cumulative EV Adoption Forecast



Transit Buses

Draft 2025 Cumulative EV Adoption Forecast



HOURLY DEMAND MODELING



Hourly Modeling Overview

- Methodology for modeling hourly demand remains largely unchanged from the CELT 2024 forecast
 - See [blue boxes on slide 4 of this presentation](#) and slides [20-24 of the CELT 2024 Transportation Electrification forecast](#) for further details

Inputs

Specific to each vehicle type

- Annual vehicle miles traveled (VMT)
- Monthly allocation of VMT
 - Reflects seasonal driving patterns
 - Allocations for monthly VMT to weekdays/weekends
- Hourly allocation of daily charging, by month
 - Shapes for weekdays and weekends
- Relationship between weather (daily average dry-bulb) and EV efficiency (kWh/mile)

Process

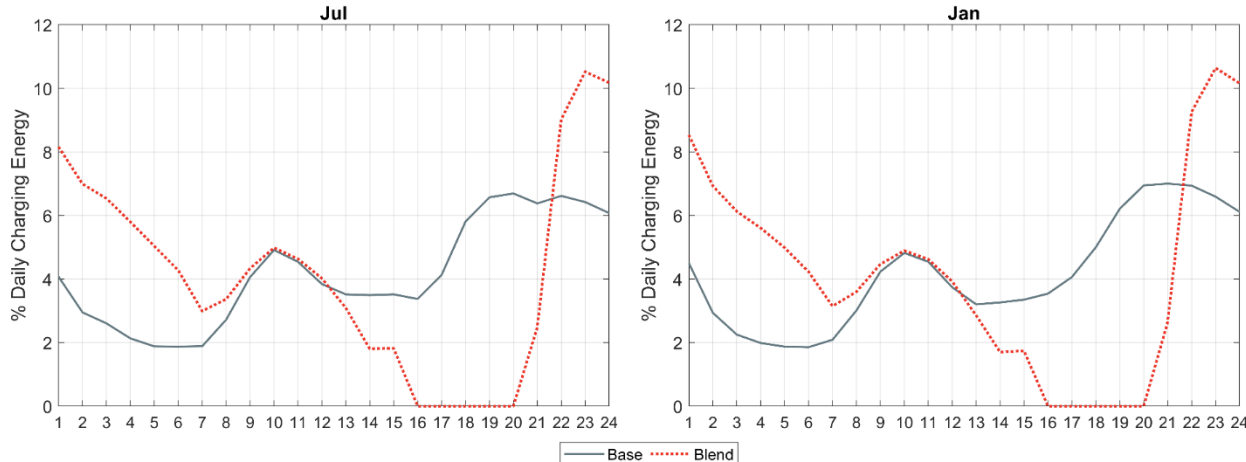
Hourly demand is developed across all hours of the 70+ year weather simulation period, for each vehicle type

- Develop VMT assumptions for weekends and weekdays within each month
- Apply temperature sensitive efficiency relationships to weather get daily energy
- Apply daily charging shapes, and phased-in EV managed charging assumptions to allocate charging to hours

Forecast of Participation in EV Managed Charging

Personal Light-Duty Vehicles

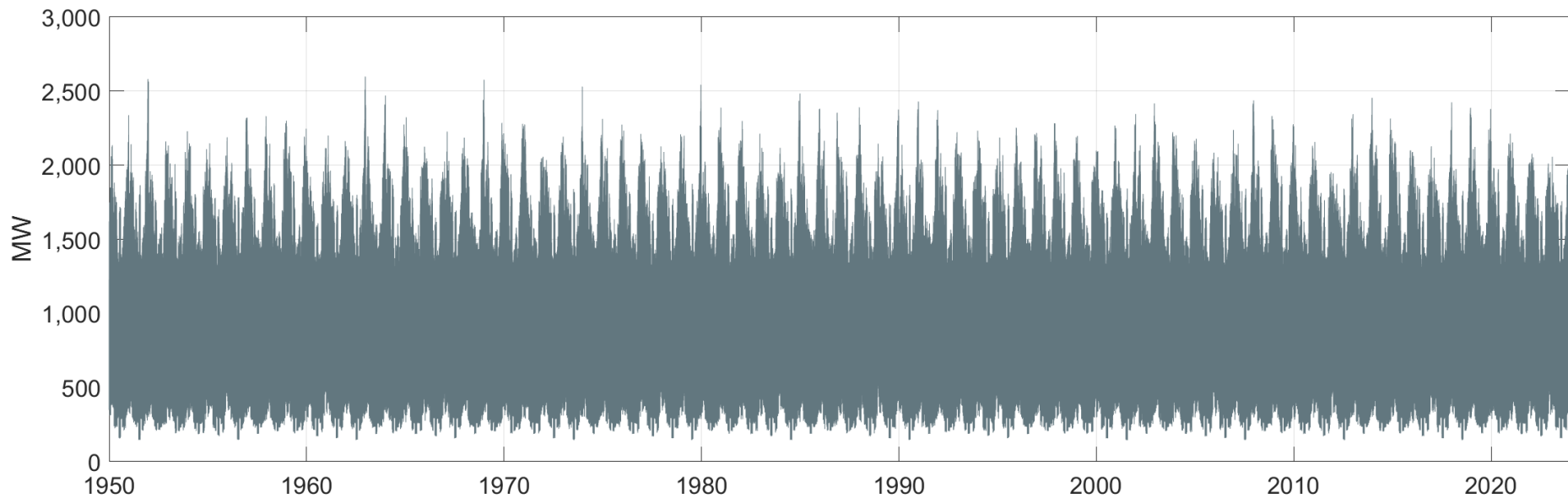
- The CELT 2025 forecast incorporates a gradual uptick in managed charging participation of personal light-duty EVs in New England over the next 10 years:
 - 2% participation in 2025
 - 11% participation in 2034
 - Incremental increase of 1% per year for years beyond 2034
- The regional blended EVMC profile shown in red below is phased into the personal light-duty EV population over the forecast horizon at the levels shown in the table to the right. (See the [January 12, 2024 presentation on Electric Vehicle Managed Charging](#) details on methodology)



Year	Participation Level (% of EV population)
2025	2%
2026	3%
2027	4%
2028	5%
2029	6%
2030	7%
2031	8%
2032	9%
2033	10%
2034	11%

Hourly Demand Across All Simulation Years

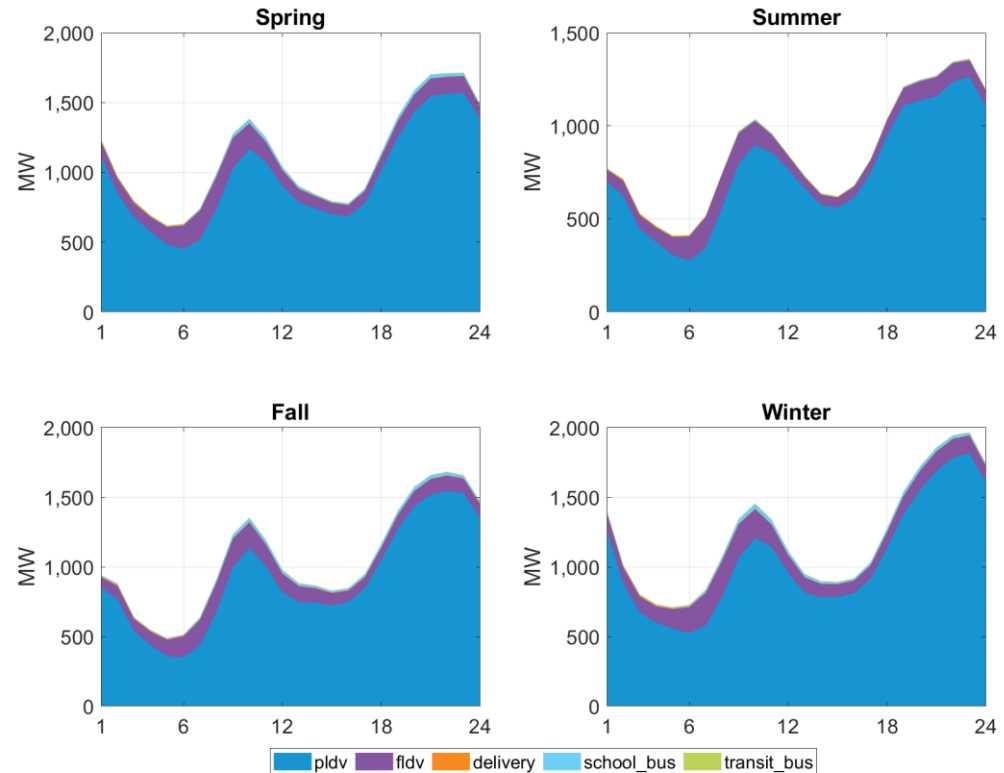
New England 2034



Typical Seasonal Load Shapes

New England 2034, by Vehicle Type

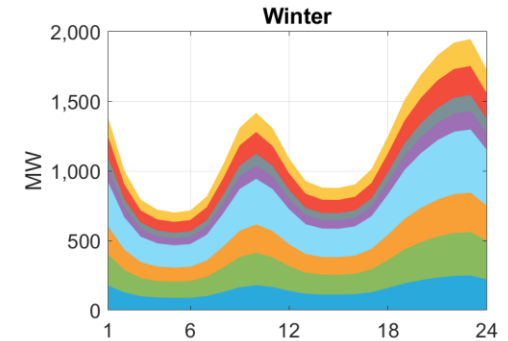
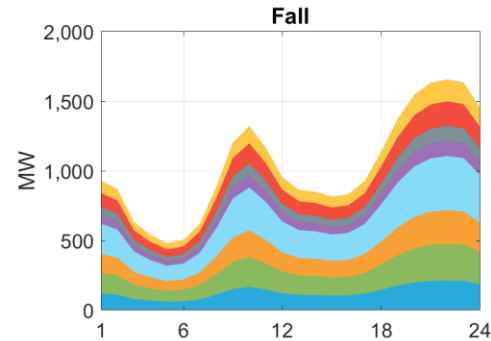
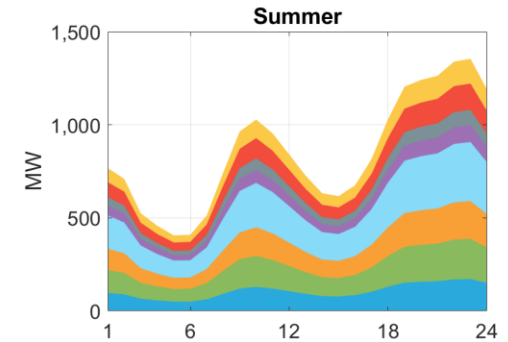
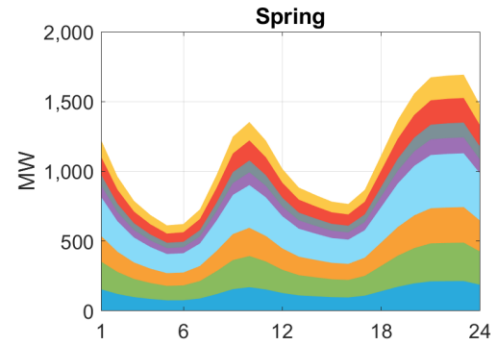
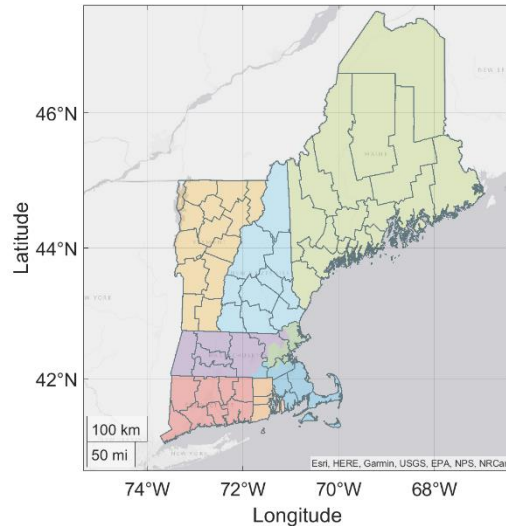
- Example seasonal profiles highlight how the hourly modeling captures the effects of EV charging across all hours of the day, during varied weather and calendar conditions
- Personal and fleet light-duty vehicles make up the largest share of EV charging demand throughout the forecast horizon



Typical Seasonal Load Shapes

New England 2034, by Load Zone

- Hourly county-level EV forecasts are aggregated to load zones based on recent EV adoption data



Next Steps

- Gross and net peak demand (*i.e.*, seasonal 50/50 and 90/10 values) are derived from the aggregated load profile resulting after compiling all load components, as discussed in the last LFC presentation today
 - Base load
 - Transportation Electrification
 - Heating Electrification
 - BTM (DER) PV
- Final draft EV forecast will be shared at the [March 28, 2025 meeting of the Load Forecast Committee](#)

Questions

