

Update on Heat Pump Forecast Enhancements



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Acronyms

ASHP	Air Source Heat Pump	HP	Heat Pump
BTM PV	Behind-the-meter Photovoltaic	HPWH	Heat Pump Water Heater
CELT	Capacity, Energy, Load, and Transmission	LFC	Load Forecast Committee
COP	Coefficient of Performance	PV	Photovoltaic
DER	Distributed Energy Resource		

Introduction

- For the CELT 2026 forecast, ISO is refining its heat pump (HP) demand modeling assumptions
 - Recent studies and analyses suggest that demand models are likely overstating electric demand, especially for full heating pathways on the coldest days
- Considerations
 - The definition and implementation of full heating applications across state programs can differ from the assumptions used in the ISO's HP forecast
 - The current HP forecast does not include building efficiency gains due to weatherization measures, which are often an integral component of a HP installation
 - Assumptions around resistance backup in full heating applications may not reflect true HP operation as temperatures approach and fall below design temperatures

HP Forecasting and Data Constraints

- A lack of comprehensive data for HP installations and metered HP demand time series continues to be a significant constraint on forecast capabilities
 - ISO continues to research possible data sources and work with the states to obtain more comprehensive data
- An inventorying and review of recent HP metering studies and other related information was performed this summer

Heat Pump Adoption Forecast Update

- As part of the shift in federal policy priorities, federal tax credits for heat pumps authorized under the Inflation Reduction Act are expiring at the end of 2025
 - State policy and program support remains intact
- ISO proposes to implement a uniform 5% reduction in projected adoption for all sectors and heating pathways to reflect the impact of the expiration of federal policy support

Demand Modeling Updates

Building Weatherization

- Building weatherization measures (e.g., insulation and air sealing) are often a core component of a HP installation
 - Weatherization reduces heating requirements, and therefore, enables the more effective sizing and design of a HP system
 - State policies are increasingly combining heating electrification with weatherization
- Weatherization assumptions are currently not explicitly factored into the HP forecast
 - Demand modeling is based on NREL's ResStock and ComStock databases, which rely on building stock characteristics from 2018 or prior
- ISO proposes the following changes to its HP demand modeling to account for weatherization
 - A 15% reduction in assumed residential space heating demand
 - A 5% reduction in assumed commercial space heating demand

Demand Modeling Updates

Electric Resistance Backup in Full Heating Displacement Applications

- In full heating applications, the HP forecast assumes that electric resistance is used to serve heating needs when outdoor temperatures are lower than a HP's minimum operating temperatures, and supplemental heating is needed
 - Based on discussions with states and comparisons to recent metering studies, auxiliary electric resistance heating is likely overrepresented in full-displacement demand modeling
 - HPs likely continue to operate and provide heat, even as temperatures fall below design specification
- ISO proposes a 10% reduction to a parameter used in full heating HP modeling that represents maximum demand (in kW), inclusive of the assumed backup electric resistance demand
 - The effect of this reduction will be 10% less resistance backup heat available during cold conditions, especially those below minimum operating temperatures

Assessment of Preliminary Impacts

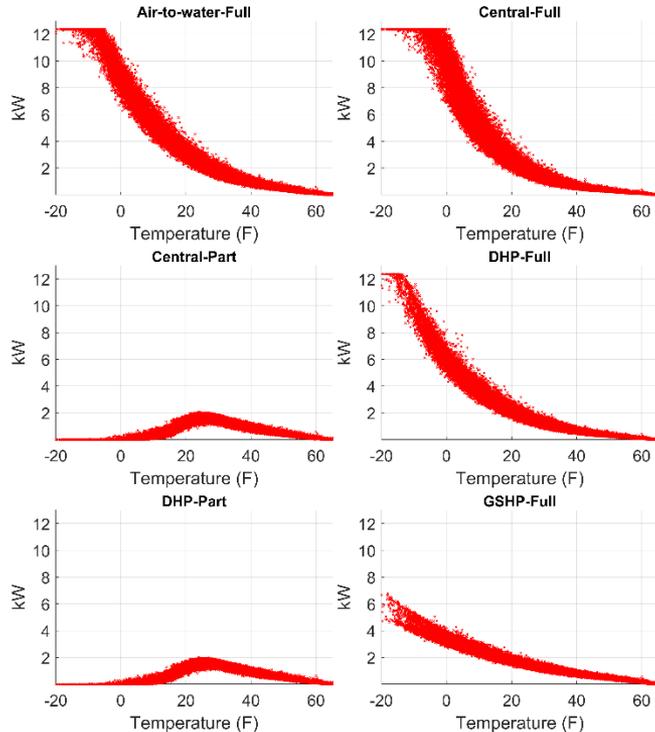
Based on CELT 2025

- Plots on the next slide illustrate the impacts of the proposed demand modeling changes for residential HPs installed in single-family, detached homes
- These demand modeling improvements, in tandem with the lowered HP adoption, are expected to decrease the HP forecast by approximately 20%, relative to CELT 2025
 - This will result in slower winter energy and demand growth, and will delay the forecast transition of New England to a winter peaking system

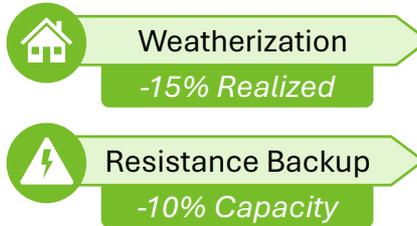
Example of HP Demand Modeling Changes

Residential, Single-Family Detached Home

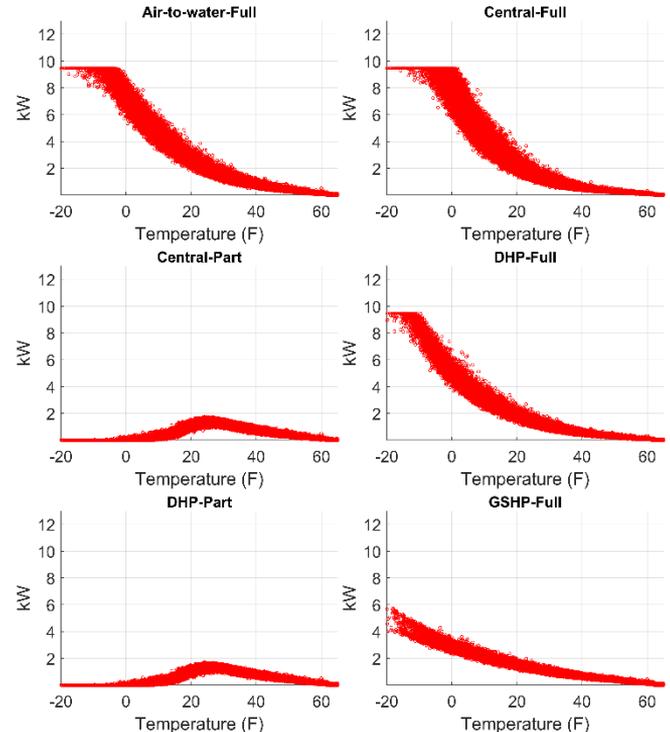
CELT 2025



Updates Account For:



CELT 2026 - Proposed



Next Steps

- ISO will continue discussing HP forecast assumptions with representatives from the New England states
- ISO will present the draft 2026 HP forecast at the upcoming Load Forecast Committee meeting on December 12th

Questions

