New York ISO
Independent System Operator

2021 Long Term Forecast Load Shape Discussion

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Demand Forecasting & Analysis

Load Forecasting Task Force

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Agenda

- **Summer Load Shape Projections**
  - 2021, 2031, 2041, and 2051 – including the impacts of behind-the-meter solar, electric vehicles (EV), and other electrification (e.g. cooking and water heating end uses). Represents a high load day in late July for the New York Control Area (NYCA).
- **Winter Load Shape Projections**
  - 2021, 2031, 2041, and 2051 – including the impacts of behind-the-meter solar, electric vehicles, and other electrification (e.g. space heating, cooking, and water heating end uses). Represents a high load day in early January for the NYCA.
- **Other Peak Impacts**
- **Future Work**

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Summer Load Shape Projections

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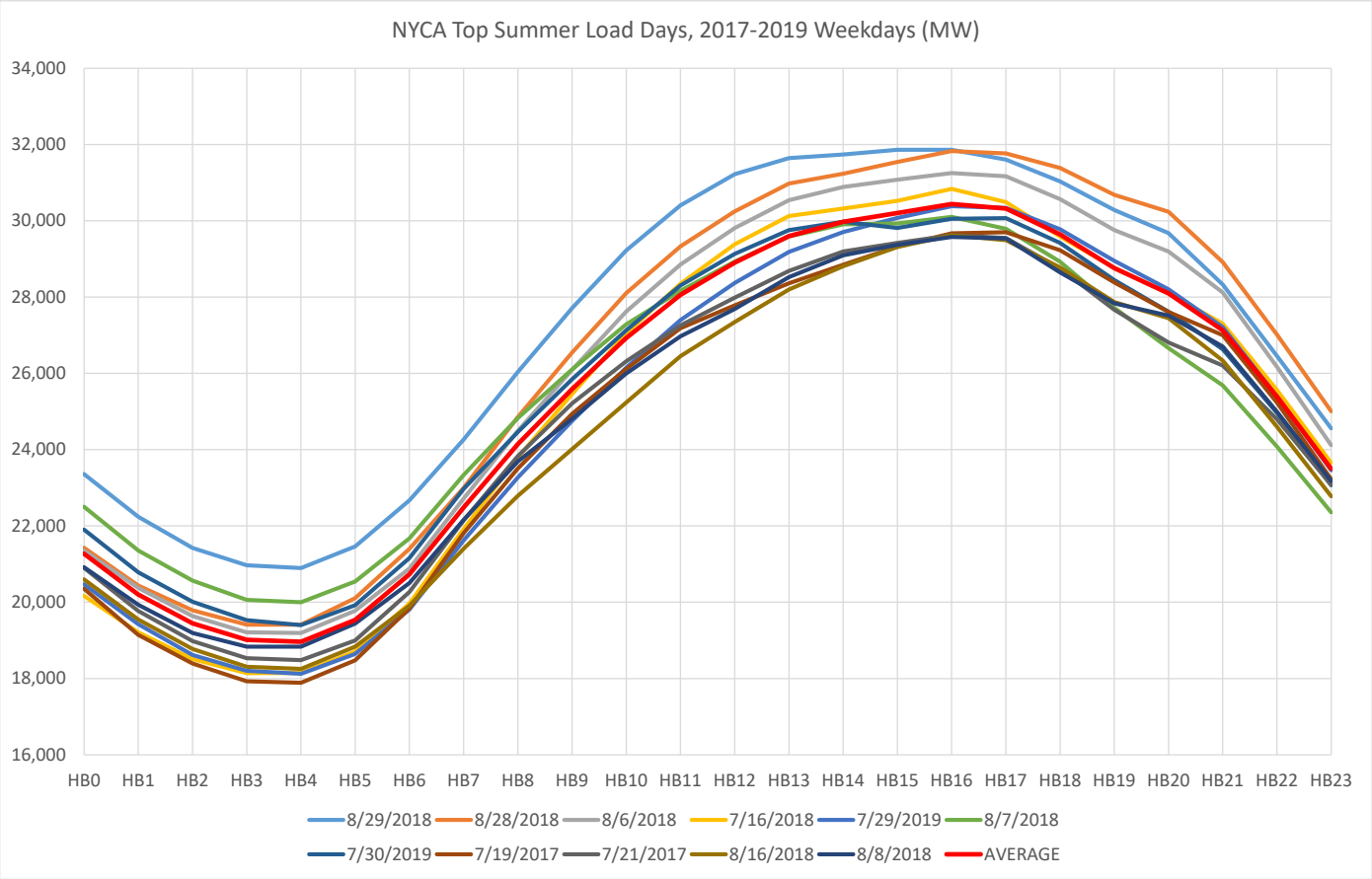
Base Summer Load Shape



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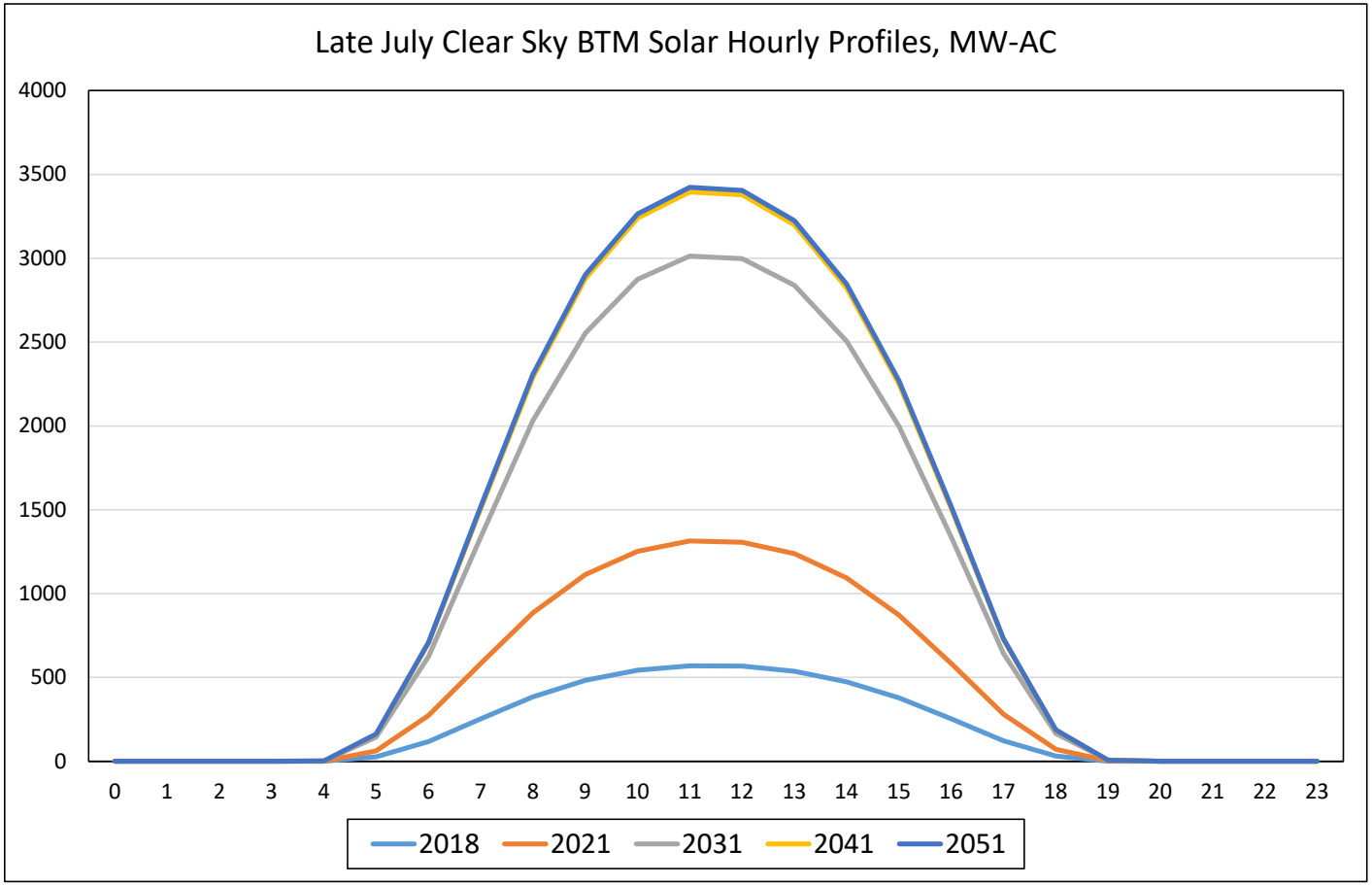
Behind-the-Meter Solar Shape - Summer



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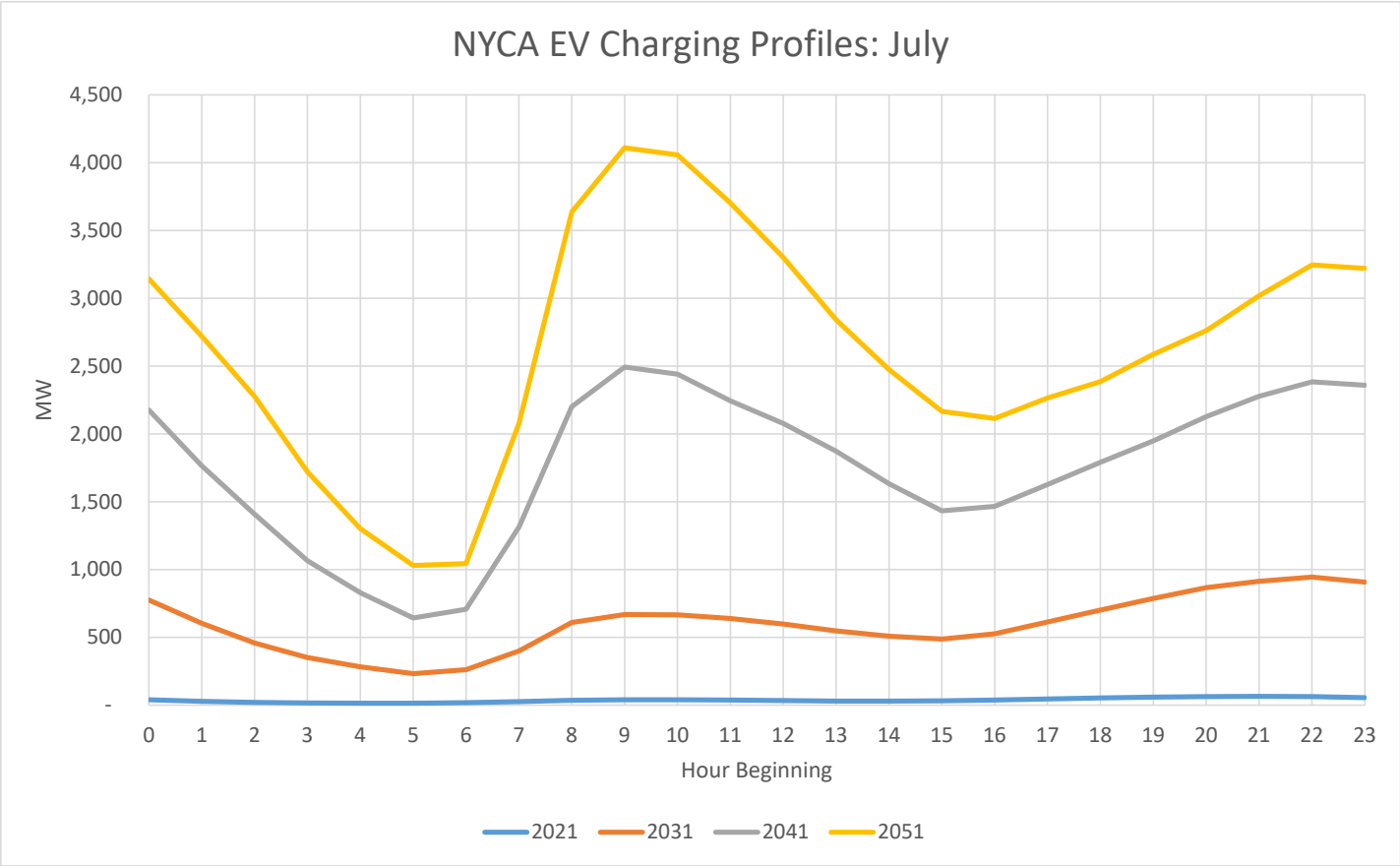
EV Charging Shape - Summer



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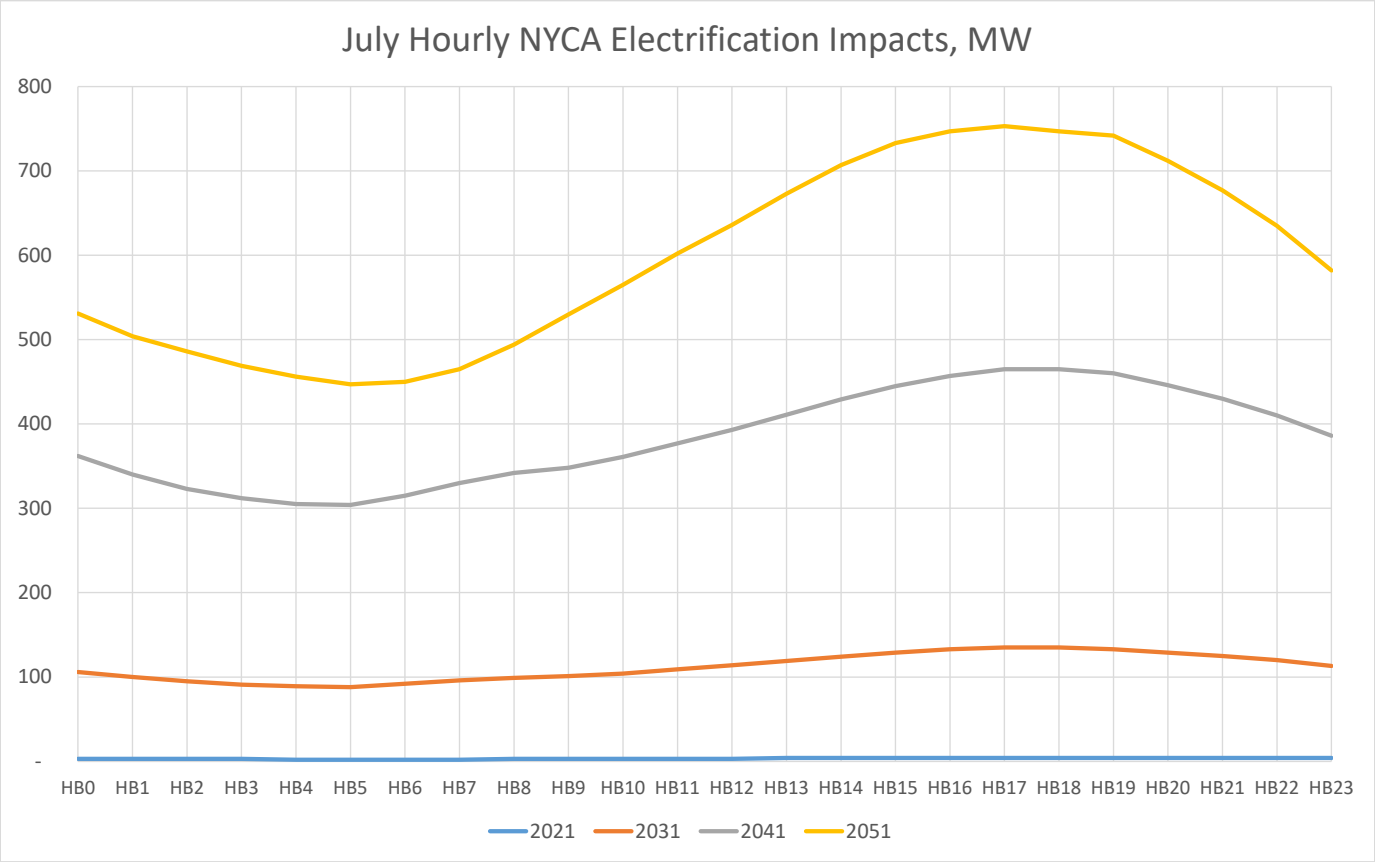
Other Electrification Shape - Summer



Note: These profiles are generally based on scaled electrification shapes from the NYISO *Climate Change Impact Study Phase I* CLCPA Case

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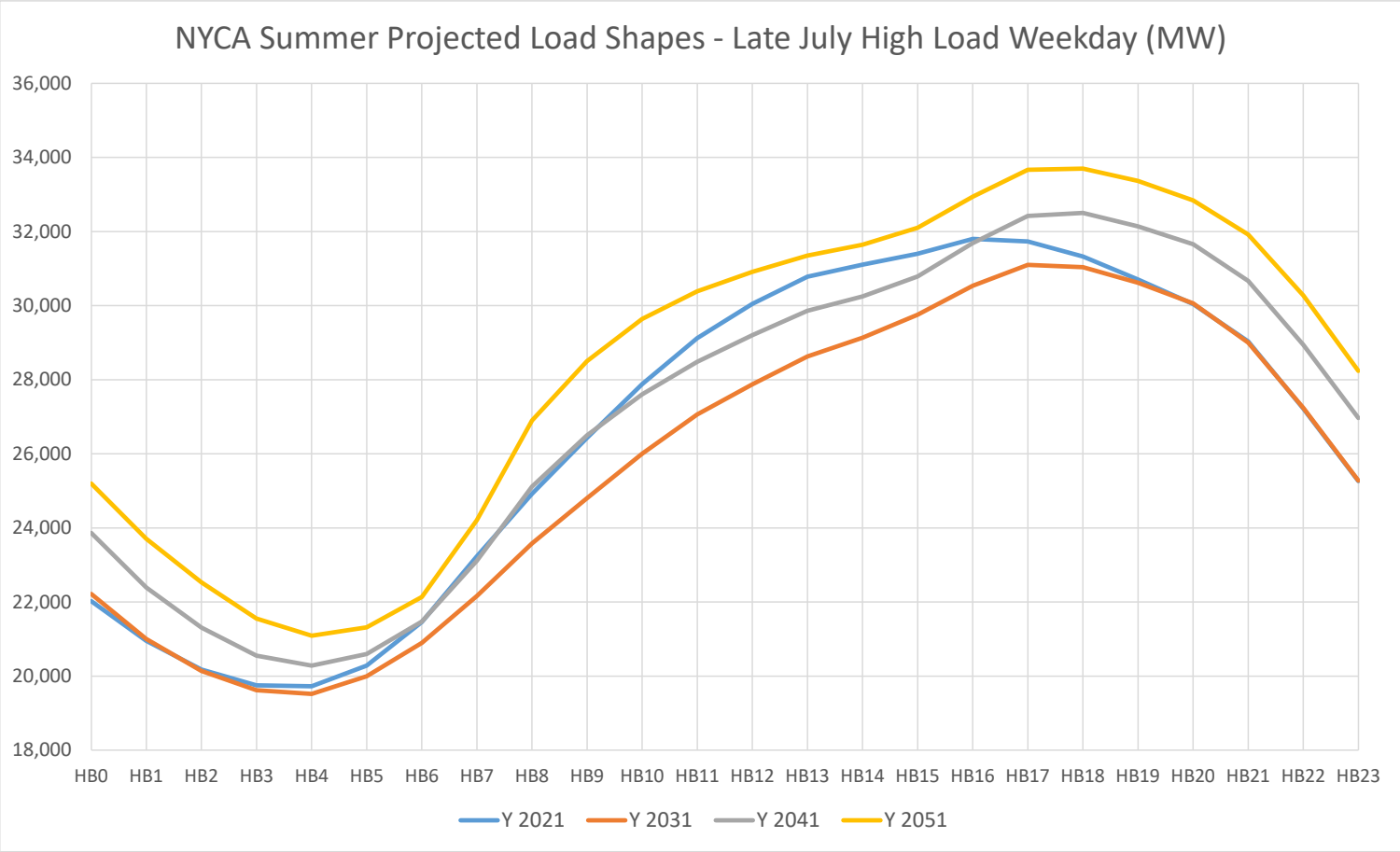
Projected Summer Load Shapes



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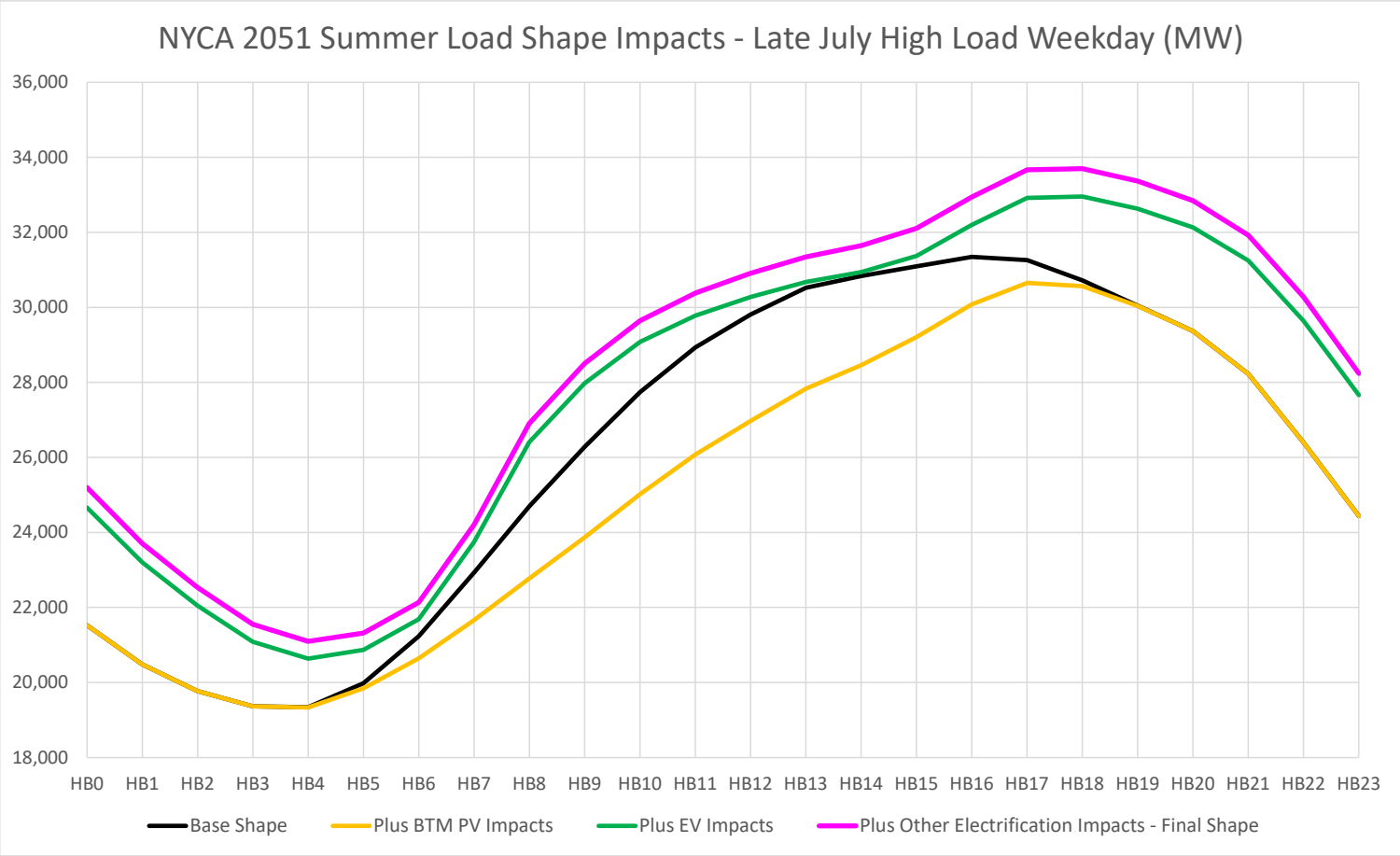
2051 Summer Load Shape Impacts



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Winter Load Shape Projections

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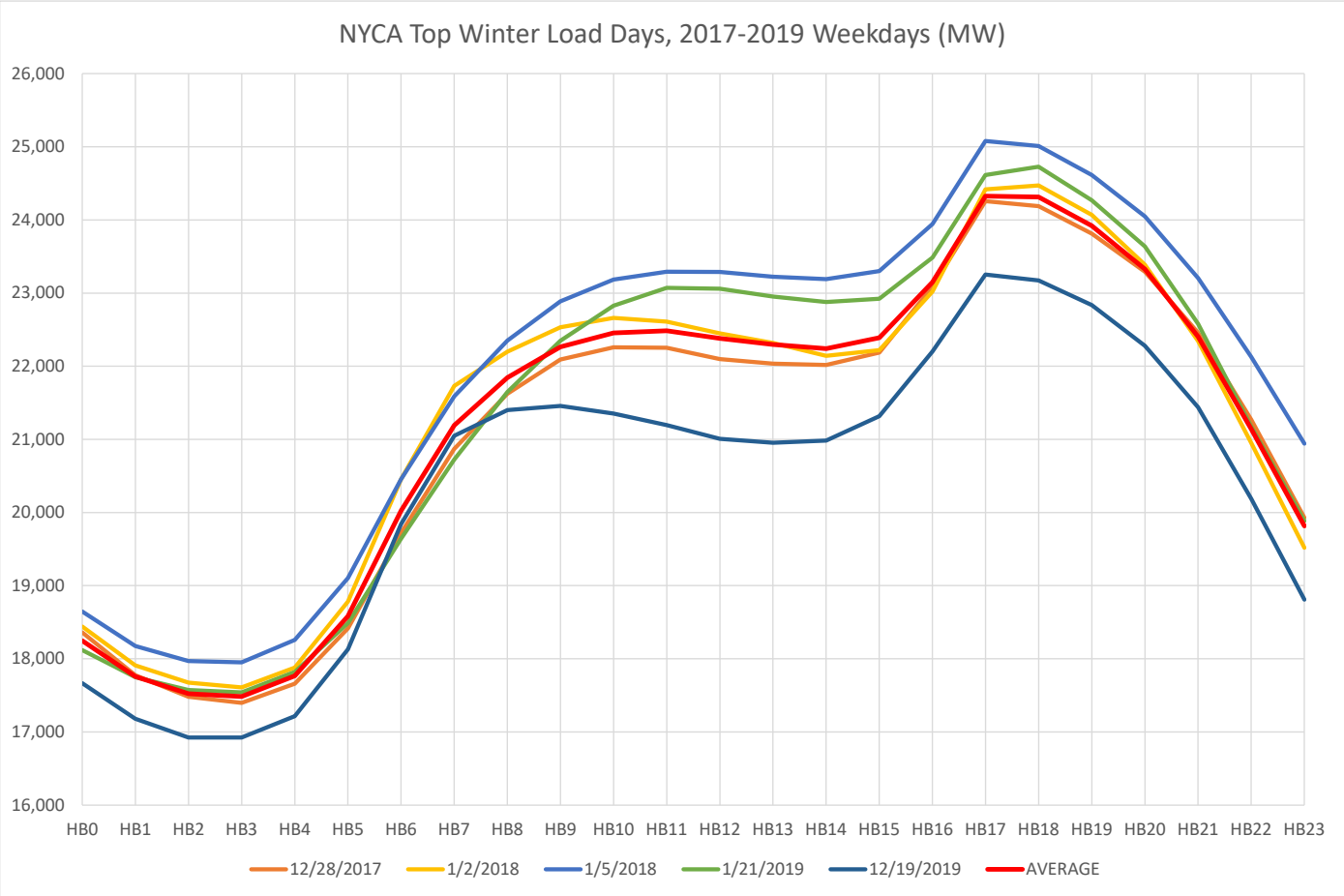
Base Winter Load Shape



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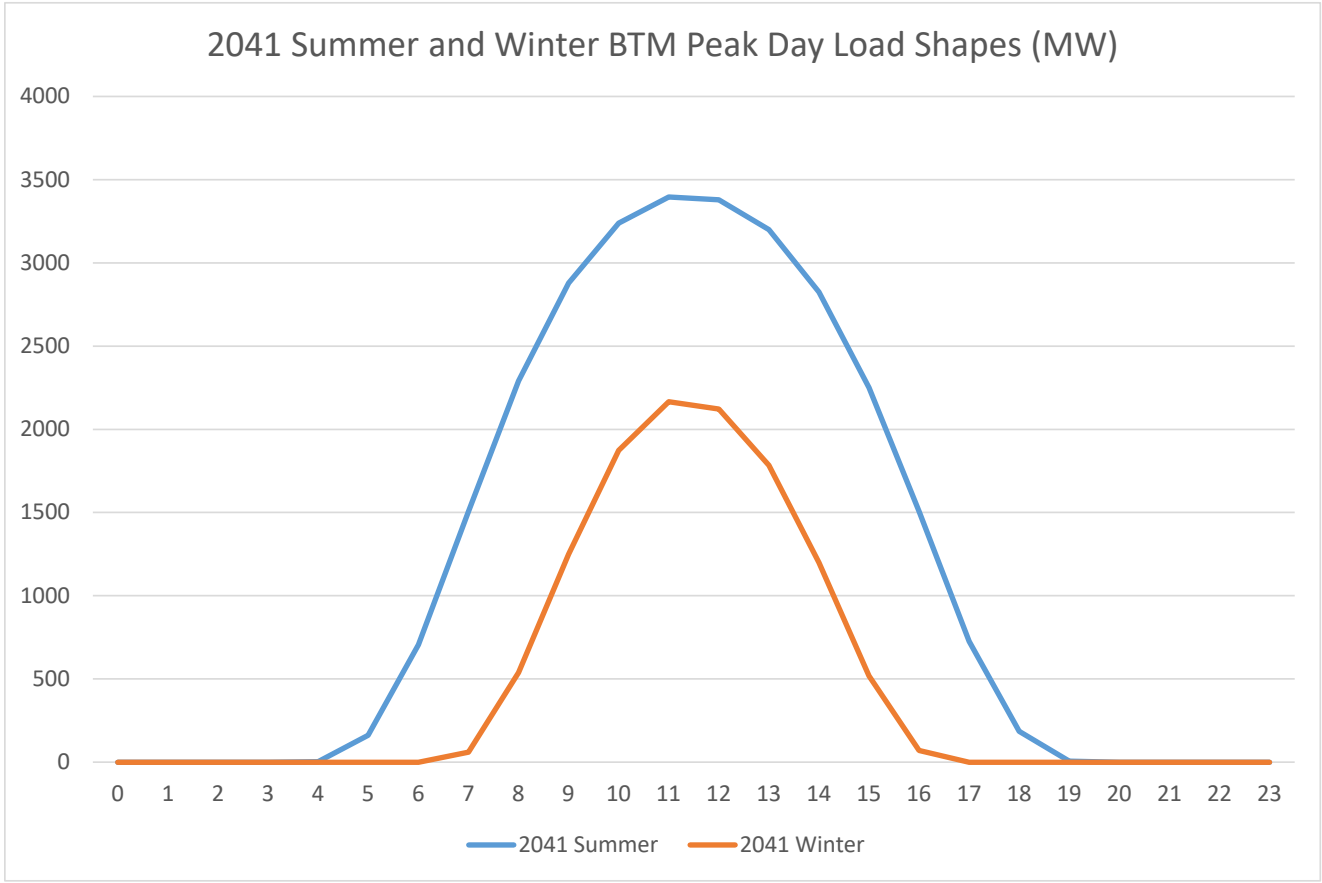
Behind-the-Meter Solar Shape Comparison



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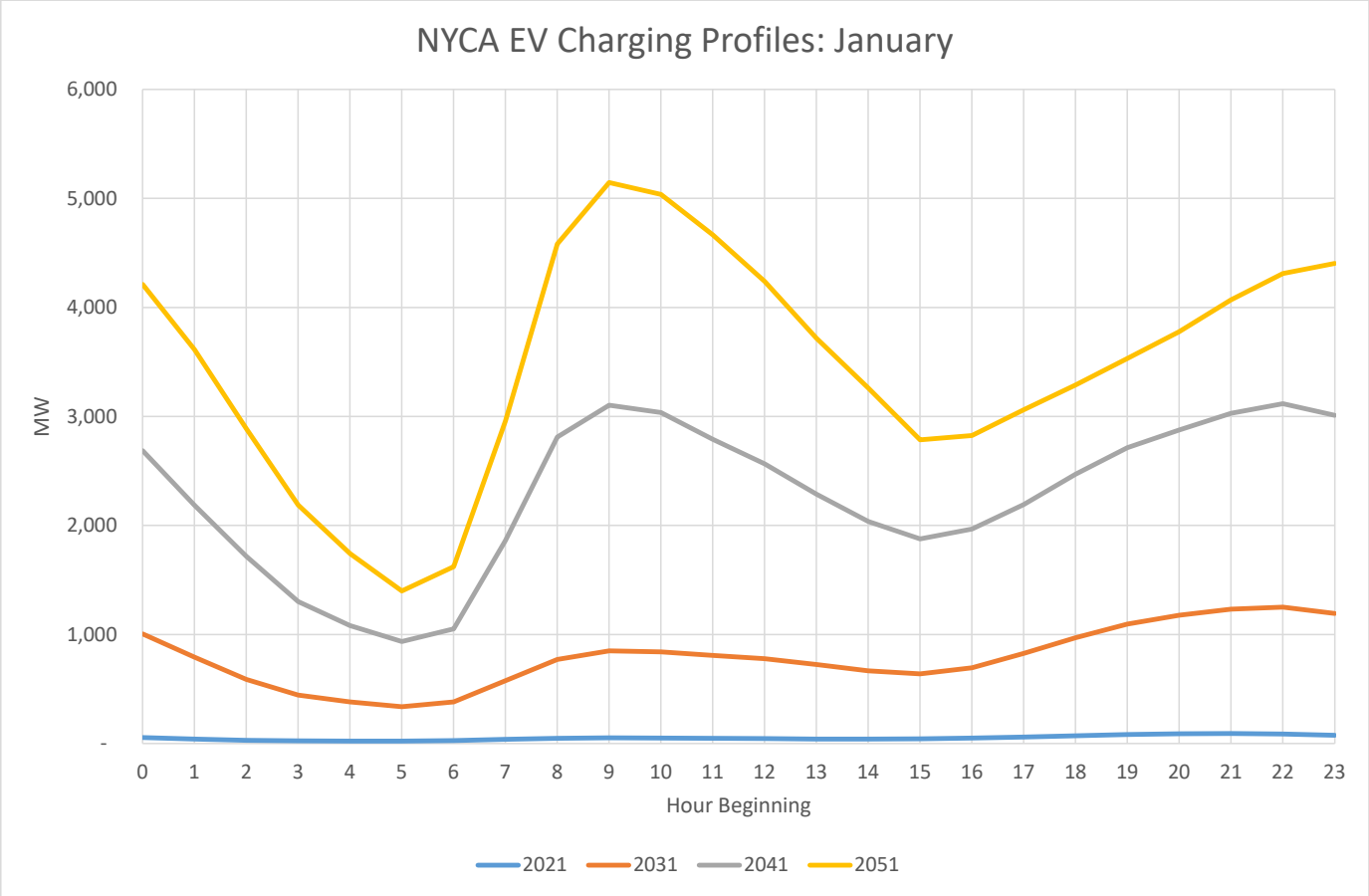
EV Charging Shape - Winter



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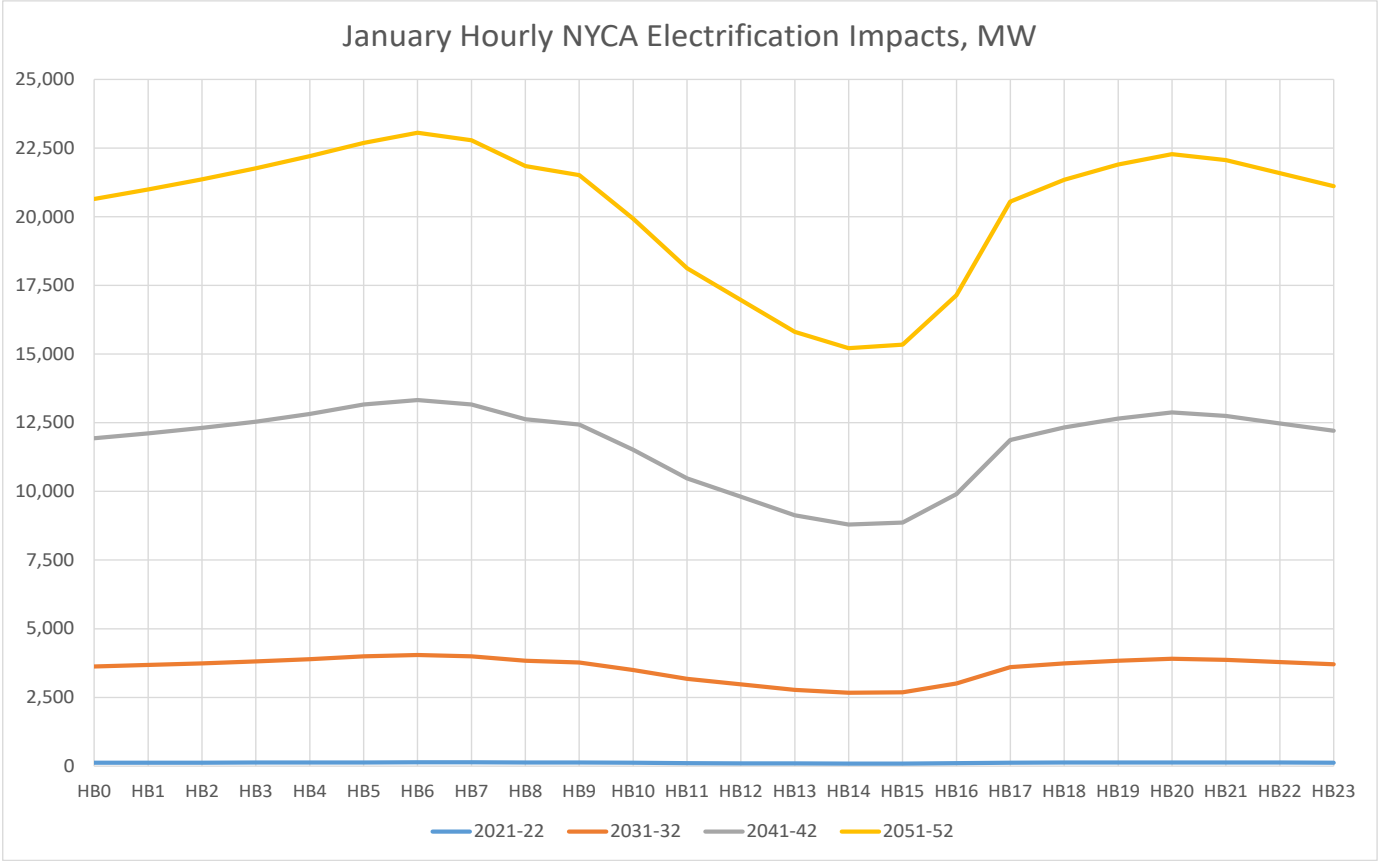
Other Electrification Shape - Winter



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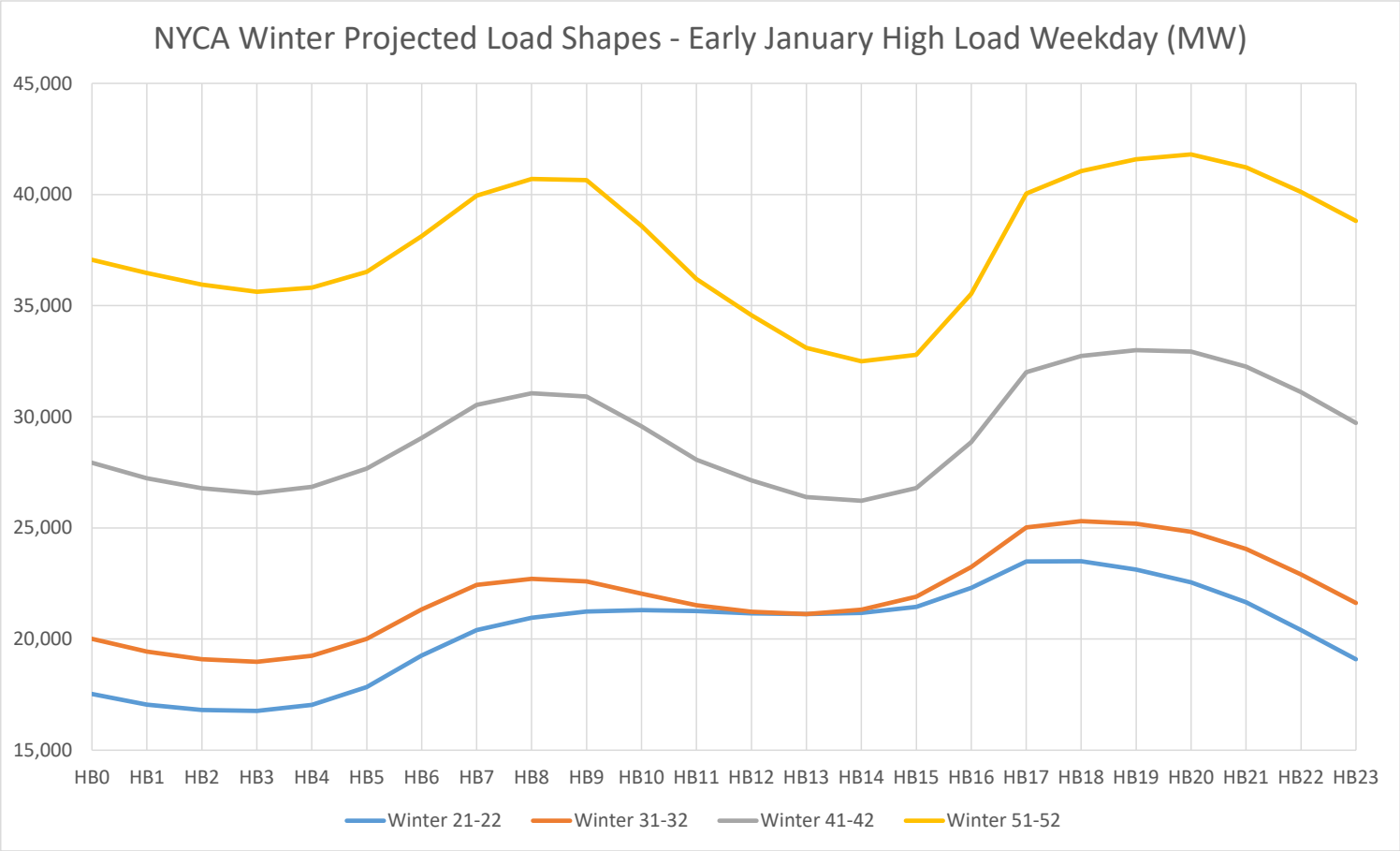
Projected Winter Load Shapes



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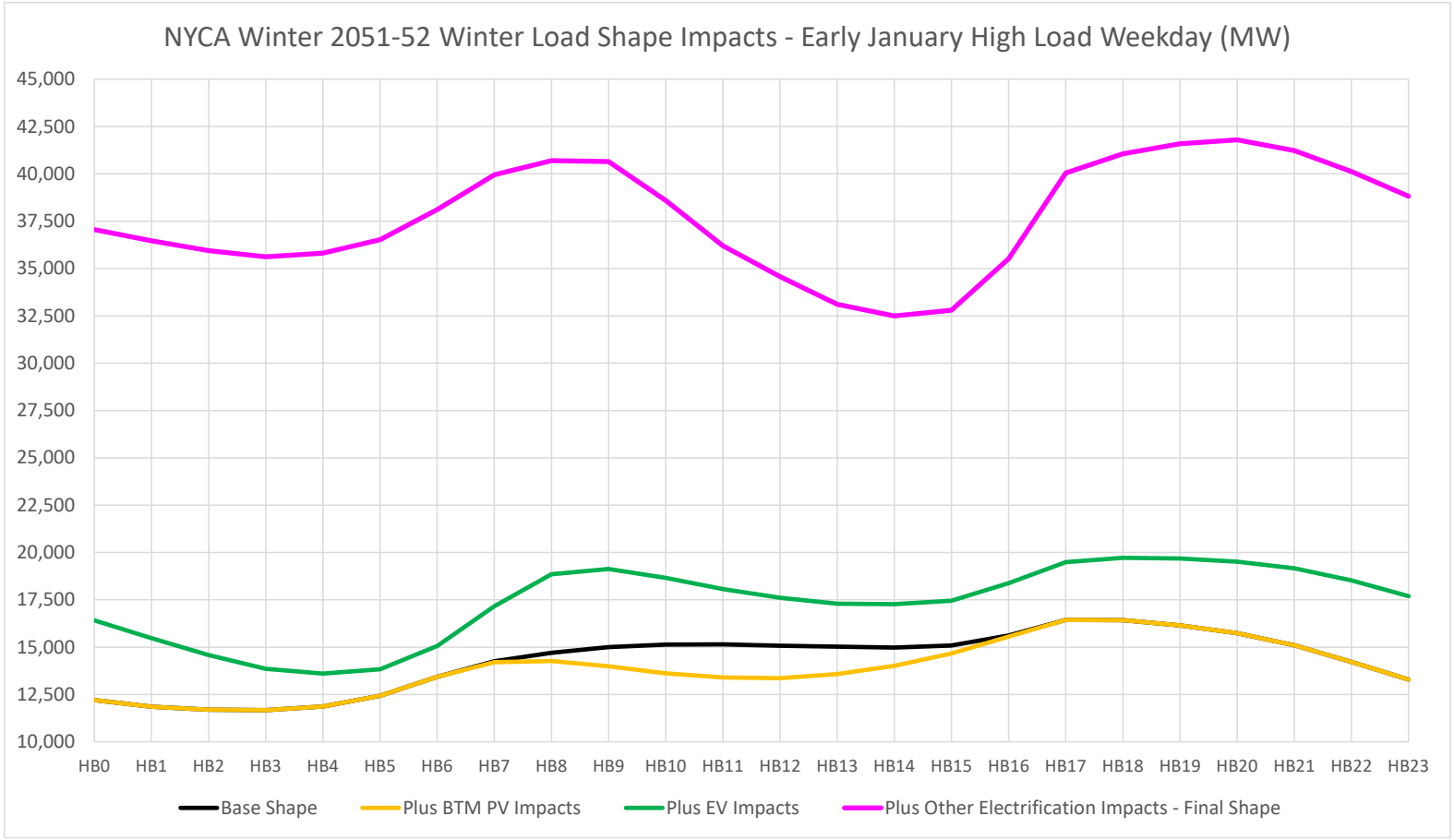
2051-52 Winter Load Shape Impacts



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Other Peak Impacts and Future Work

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Energy Storage

- Behind-the-meter (BTM) energy storage will impact peak load day shapes in future years. The impacts of BTM storage were not incorporated into this analysis.
- The Gold Book energy storage forecast includes projected capacity for both wholesale and BTM storage. Based on the relative sizes of the NYISO and New York State Standardized Interconnection Requirements (SIR) interconnection queues, over 85% of additional storage capacity over the forecast horizon is projected to be wholesale.
- Over the forecast horizon, BTM storage resources are assumed to have net injections onto the grid resulting in 35% to 55% reductions in peak load relative to their nameplate capacity, with the proportion injecting during the peak hour increasing over time.
- Wholesale market storage is assumed to be dispatched by the NYISO similar to other generation in order to meet the load. Thus, while wholesale storage does not act to reduce the measured NYISO peak demand, when dispatched it would lessen the requirements of other wholesale generation during the peak hour.

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Energy Efficiency and Codes & Standards

- The impacts of energy efficiency (EE) and codes & standards (i.e. building and appliance) were not incorporated into this analysis.
- Since energy efficiency gains are projected across most end uses, and since the load factor of energy efficiency is generally high, energy efficiency is not expected to have proportionally large impacts on the assumed load shape in future years.
- Energy efficiency peak impacts for the long-term forecast were developed using assumed EE load factors. These load factors were derived from an analysis of the Energy Efficiency Transition Implementation (ETIP) and U.S. Department of Energy Information Administration (EIA) reports based on a central tendency, differing by Transmission District.

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Future Work

- Analysis of energy efficiency and BTM energy storage impacts on projected future year peak load shapes

- Further analysis of the load shapes for the forecast components will be presented

- Development of a bottom up peak load forecast based on 8,760 hourly profiles of modeled base load; and hourly profiles for exogenous forecast components such as electric vehicles, other electrification, BTM solar, and BTM energy storage

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Questions?

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- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

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