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Independent System Operator

2024-33 Summer Gross Peak Forecast & Shapes

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Demand Forecasting & Analysis

ESPWG/TPAS/LFTF

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Agenda

- Background & Forecast Methodology
- Gross Peak Forecast Summary
- Supporting Graphs
- Transmission Security Margin Demand Shapes

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Background

- The gross peak forecast was developed for use in planning resource adequacy simulations
- 2024 to 2033 forecast horizon
- The forecast reflects the projected maximum gross demand (measured load plus BTM solar generation) for each summer
- Provides maximum demand targets for GE MARS modeling, as BTM solar is modeled randomly as a resource
- Winter gross peak forecast matches the Gold Book net peak forecast. The gross and net peak hours are the same, as the projected gross peak demand hour occurs after sunset over the winter peak

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Forecast Methodology

- **Generate projected NYCA peak day net load, BTM solar, and gross load shapes**
  - BTM solar projections are based on historical sampled inverter data, solar capacity schedule forecast, and projected BTM solar site mix and characteristics
- **Calibrate these shapes to reflect 2024 conditions, including 2024 forecast net peak load and the projected 2024 solar capacity level**
- **Produce annual peak day solar profiles for 2024 through 2033 reflecting increasing capacity levels from the 2023 Gold Book**
- **Calculate 2024-2033 projected peak day net and gross load shapes**
  - Net load peaks match the 2023 Gold Book peak forecast
  - The divergence in the net and gross shapes increases over time as BTM solar penetration increases
- **The NYCA Gross Peak forecast is the maximum value from the gross load shape**
- **Zonal Forecast Derivation:**
  - Starting point in each zone is the 2023 Gold Book net peak forecast
  - BTM solar generation is apportioned to the zones via shares of expected BTM solar generation at 4 pm during a July peak-type load day (the expected gross peak hour is 4 pm)

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Gross Peak Forecast Summary

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Baseline Coincident Peak Forecast

Table I-3a-G: Gross Baseline Summer Coincident Peak Demand Forecast

Reflects Impacts of Energy Saving Programs & Behind-the-Meter Generation

Coincident Summer Peak Demand by Zone - MW

Gross Forecast (Load plus BTM Solar Generation)

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2024	2,840	2,306	3,011	712	1,614	2,647	2,342	651	1,432	11,200	5,245	34,000
2025	2,880	2,326	3,212	716	1,648	2,683	2,326	648	1,433	11,220	5,222	34,314
2026	2,895	2,330	3,380	714	1,656	2,702	2,322	647	1,422	11,183	5,216	34,467
2027	2,885	2,339	3,413	753	1,642	2,712	2,336	647	1,417	11,131	5,225	34,500
2028	2,876	2,347	3,409	780	1,627	2,720	2,351	647	1,412	11,038	5,247	34,454
2029	2,867	2,359	3,397	808	1,630	2,736	2,374	650	1,406	10,993	5,265	34,485
2030	2,867	2,376	3,465	809	1,638	2,754	2,406	656	1,410	11,027	5,291	34,699
2031	2,871	2,396	3,489	810	1,650	2,774	2,440	664	1,425	11,139	5,313	34,971
2032	2,900	2,421	3,512	811	1,663	2,796	2,480	676	1,444	11,291	5,342	35,336
2033	2,928	2,442	3,533	812	1,674	2,816	2,521	688	1,468	11,482	5,379	35,743

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Zonal Baseline Non-Coincident Peak Forecasts

Table I-4a-G: Gross Baseline Summer Non-Coincident Peak Demand Forecast

Reflects Impacts of Energy Saving Programs & Behind-the-Meter Generation

Non-Coincident Summer Peak Demand by Zone - MW

Gross Forecast (Load plus BTM Solar Generation)

Year	A	B	C	D	E	F	G	H	I	J	K
2024	2,930	2,353	3,079	732	1,654	2,688	2,385	663	1,459	11,420	5,327
2025	2,970	2,373	3,284	736	1,688	2,724	2,368	660	1,460	11,440	5,304
2026	2,985	2,377	3,455	734	1,695	2,743	2,364	659	1,449	11,403	5,298
2027	2,974	2,386	3,489	774	1,681	2,753	2,378	659	1,444	11,351	5,307
2028	2,965	2,394	3,485	802	1,665	2,761	2,393	659	1,439	11,248	5,329
2029	2,956	2,406	3,472	831	1,668	2,778	2,417	662	1,433	11,203	5,347
2030	2,956	2,423	3,542	832	1,676	2,796	2,449	668	1,437	11,237	5,374
2031	2,960	2,444	3,566	833	1,689	2,816	2,484	676	1,452	11,359	5,396
2032	2,990	2,469	3,590	834	1,702	2,839	2,525	689	1,471	11,511	5,425
2033	3,019	2,491	3,612	835	1,713	2,859	2,566	701	1,496	11,702	5,463

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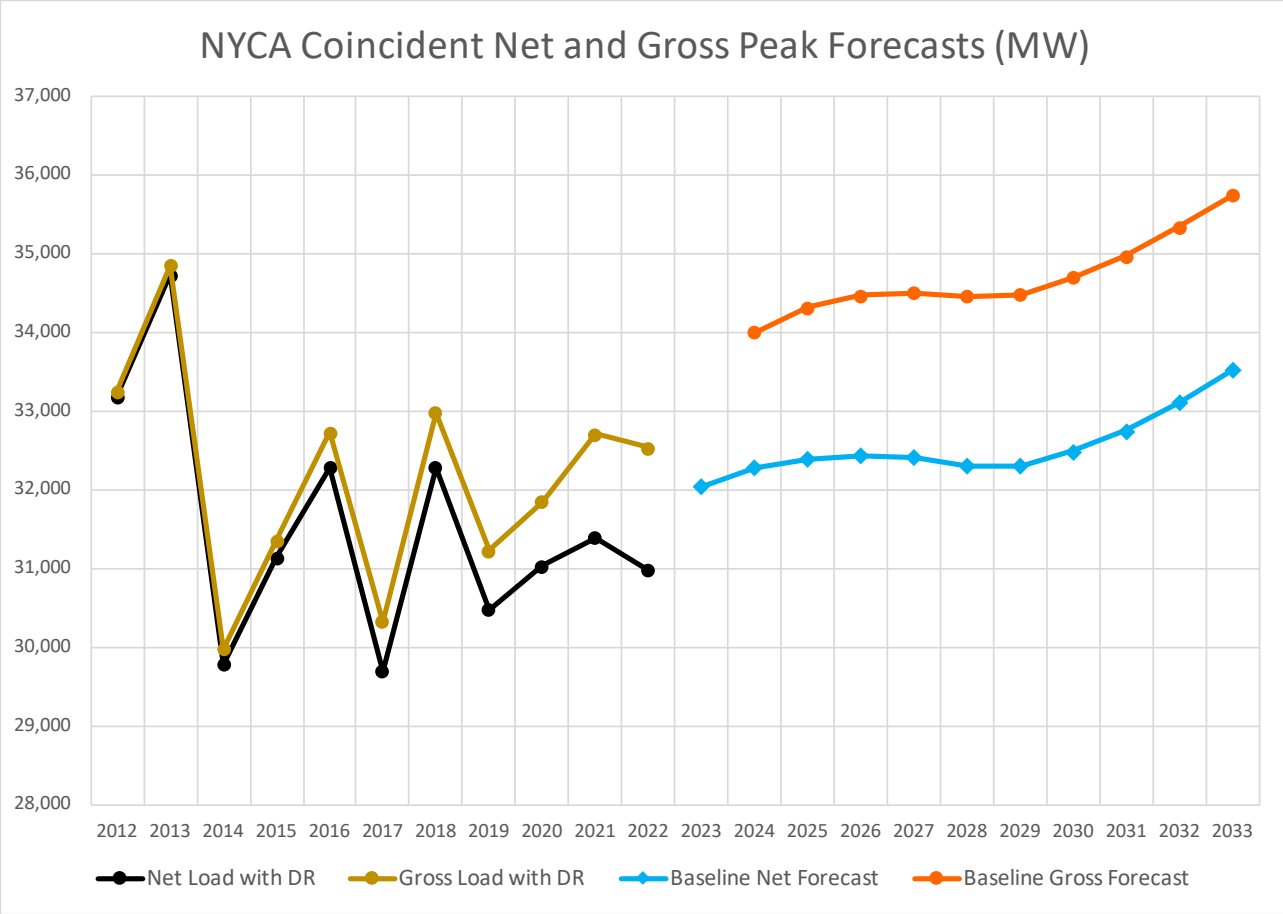
Forecast Graph



Notes:

Historical peaks include Demand Response (DR) impacts added back.

Forecast peaks show projected load prior to any DR reductions.

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Supporting Graphs

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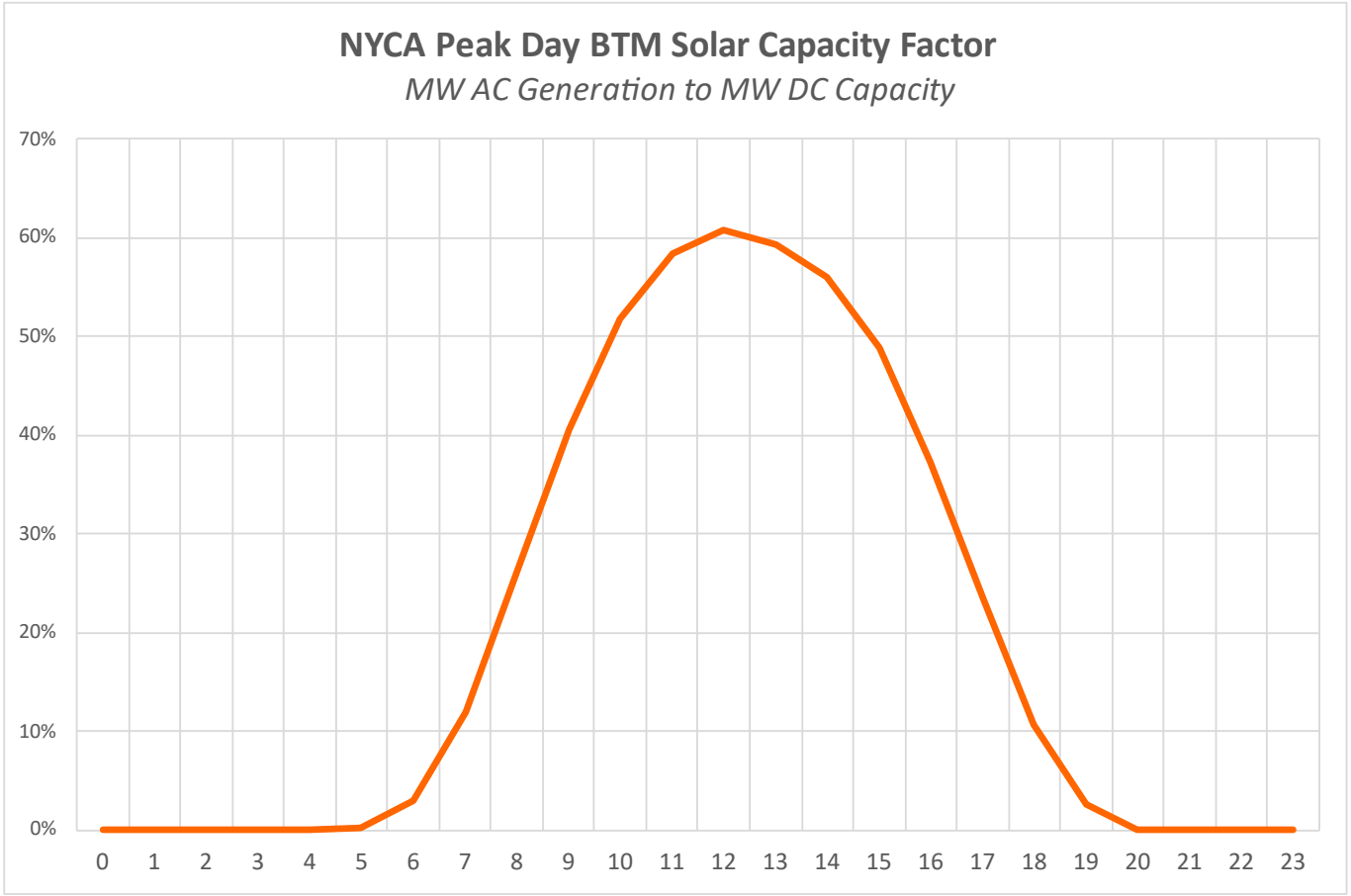
Projected BTM Solar Peak Day Capacity Factors



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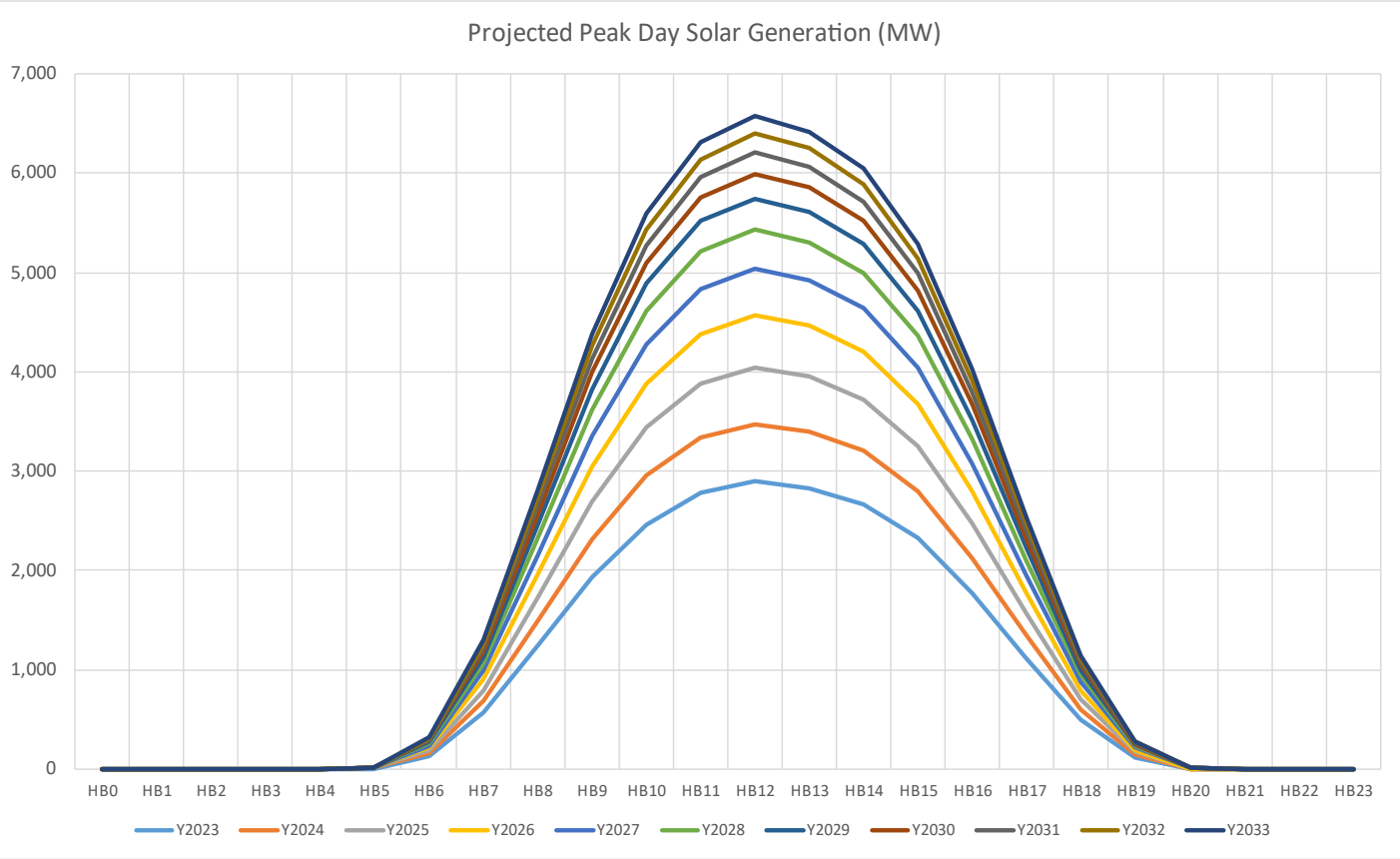
Peak Day Solar Projection



*MW AC

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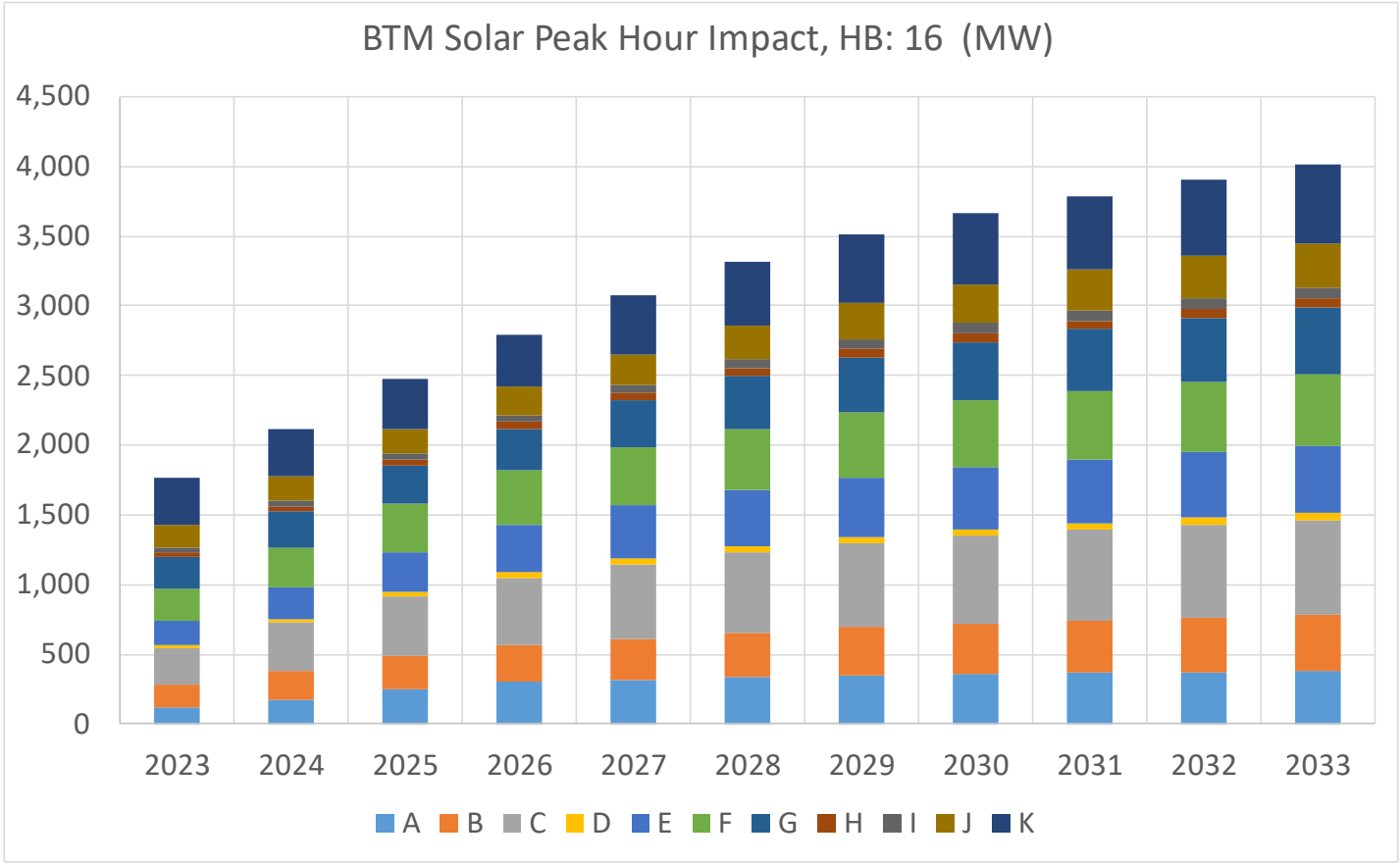
Zonal BTM Solar Impacts



*MW AC

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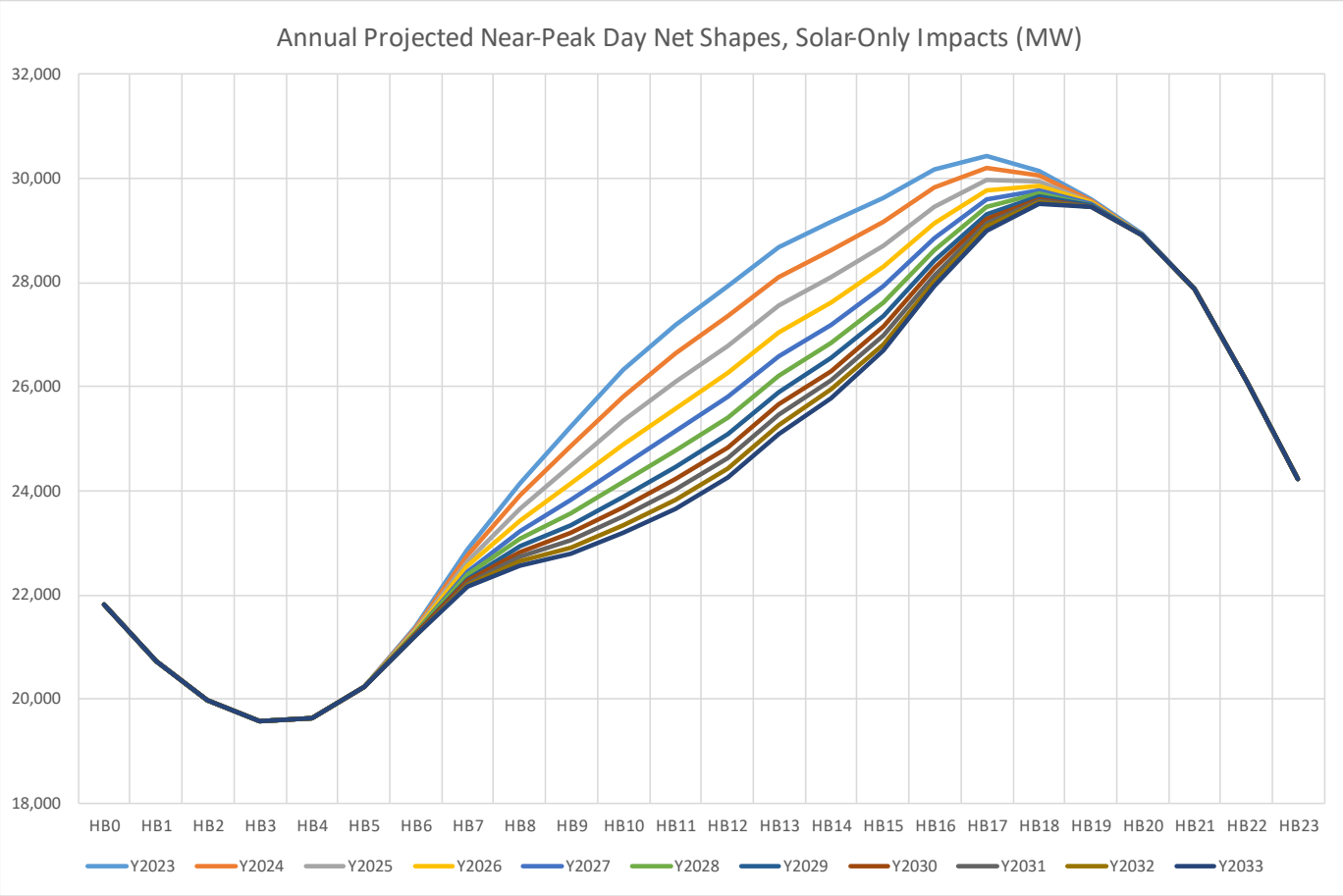
Solar Impact on Summer Load Shape



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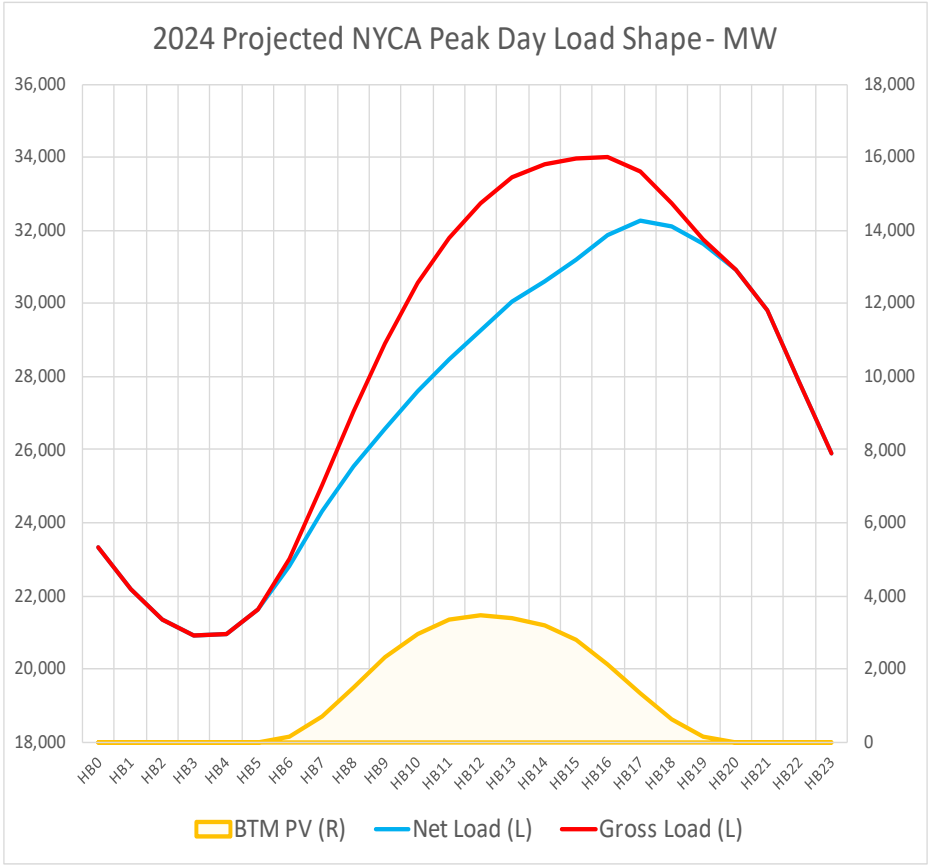
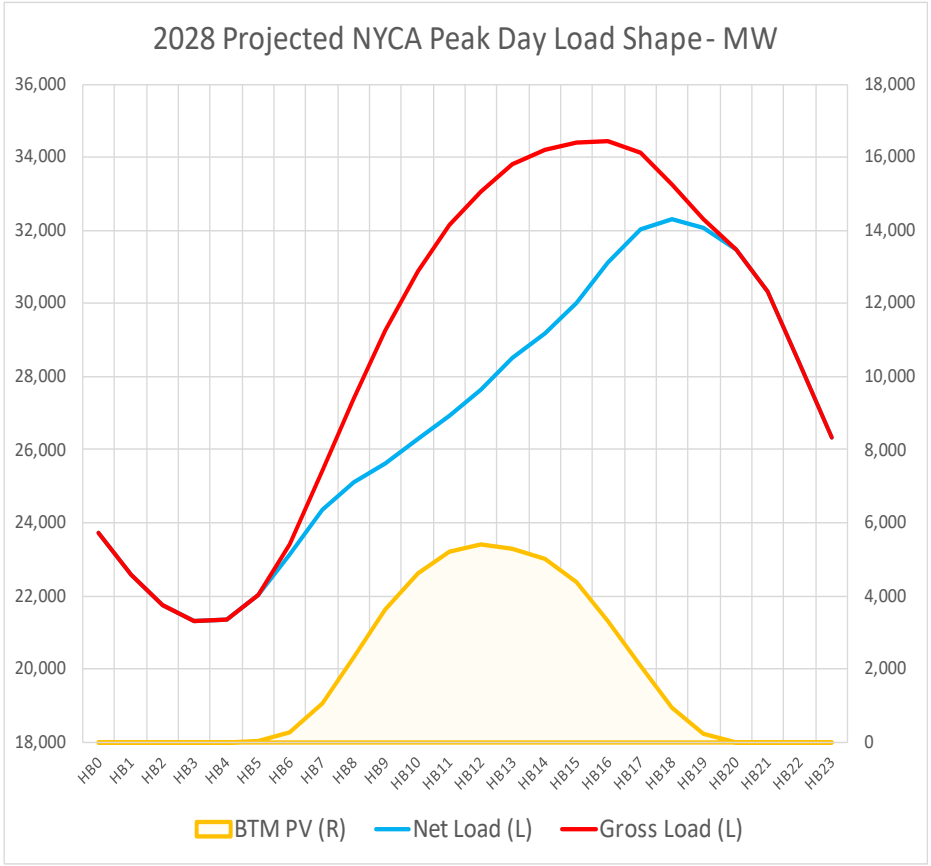
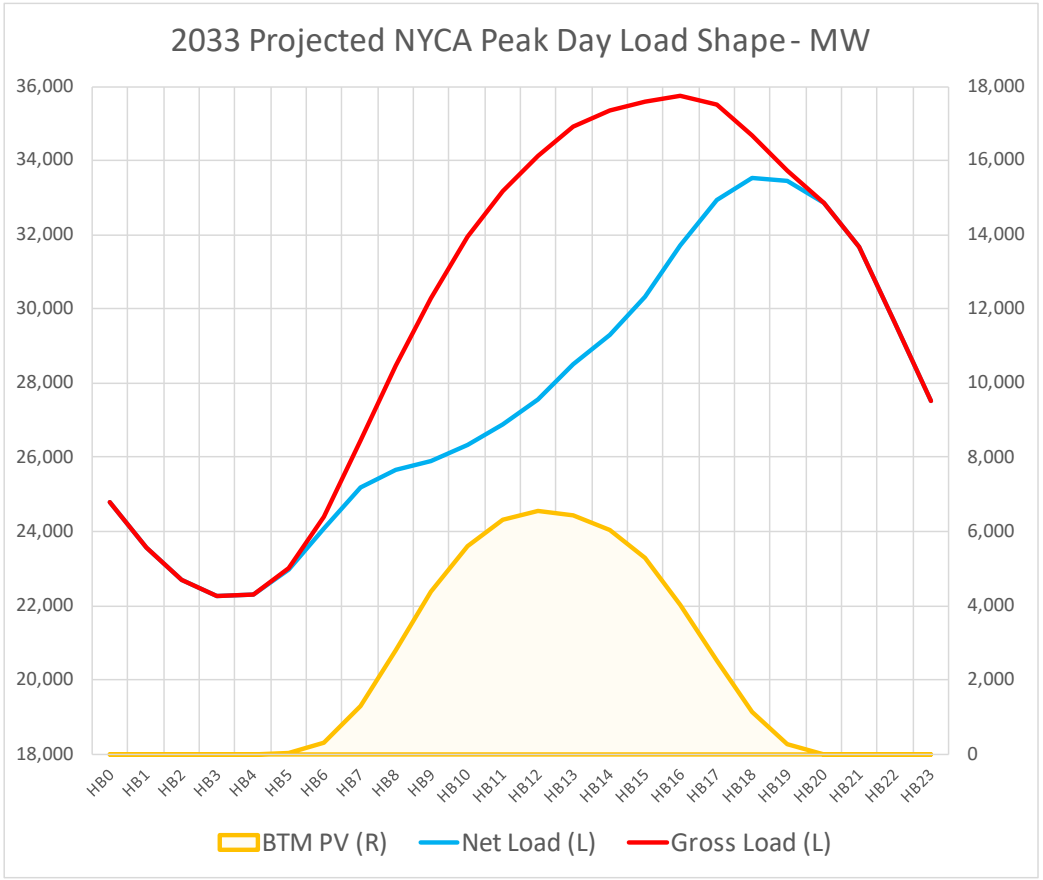
Peak Day Net and Gross Shapes (MW)





Peak Day Net and Gross Shapes (MW)



Y2033	Peak Hour	Peak MW
Net Peak	HB 18	33,520
Gross Peak	HB 16	35,743
Difference	2 hours	2,223

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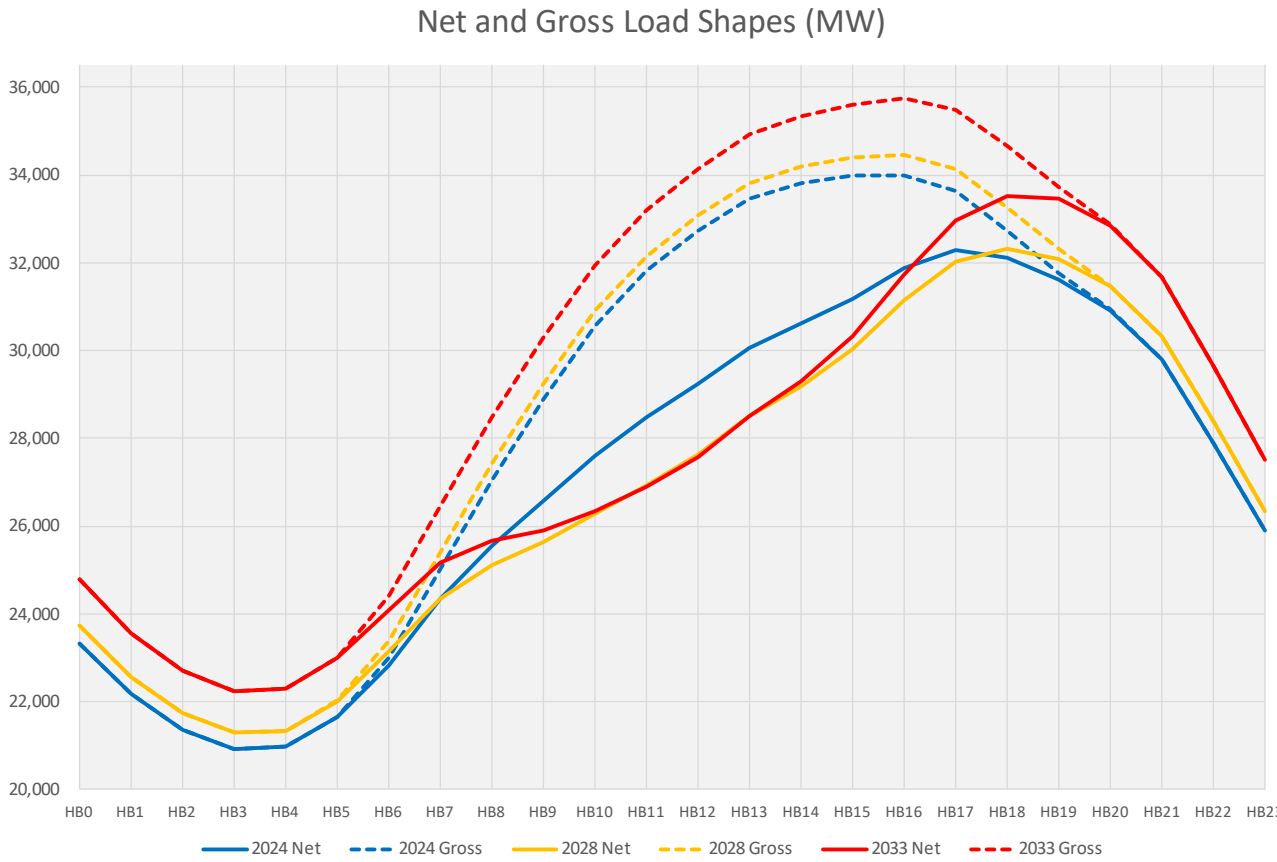
Peak Day Shape Trends



Year	2024	2028	2033
Gross Peak Hour	HB 16	HB 16	HB 16
Gross Peak MW	34,000	34,454	35,743
Net Peak Hour	HB 17	HB 18	HB 18
Net Peak MW	32,280	32,310	33,520
Noon BTM Solar MW	3,476	5,426	6,571
Delta MW*	1,720	2,144	2,223

*Gross Peak less Net Peak

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Transmission Security Margin Demand Shapes

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Transmission Security Margin Demand Shapes

- **Summer peak day load shapes were developed for purposes of the transmission security margin analyses**
  - Shapes were developed for the baseline, 90th and 99th percentile extreme heat forecasts for the NYCA and the Localities
- **In addition to the BTM solar shape impacts included in the gross peak forecast analysis, these shapes account for the projected load shape impacts of EV charging and building electrification**
  - Summer peak building electrification is largely driven by the electrification of non-weather sensitive appliances such as water heaters and stovetops. The impacts of building electrification on the summer peak load shape are relatively minor
  - EV charging impacts become more significant in the outer years, peaking around the 7pm hour
- **The combination of BTM solar reductions and EV charging push the NYCA summer peak out to the 6pm hour in 2025, and the 7pm hour as early as 2032**

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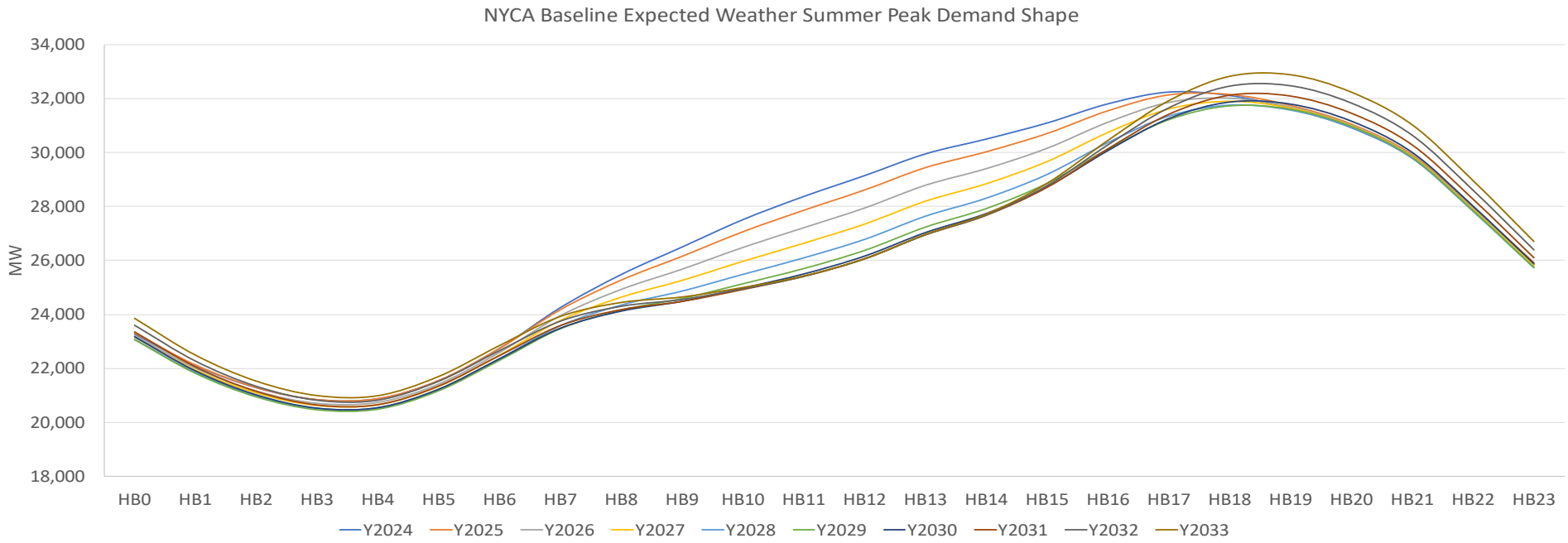
NYCA and Regional Load Shapes



Additional details are provided in Appendix E of the 2023 Quarter 2 *Short-Term Assessment of Reliability*

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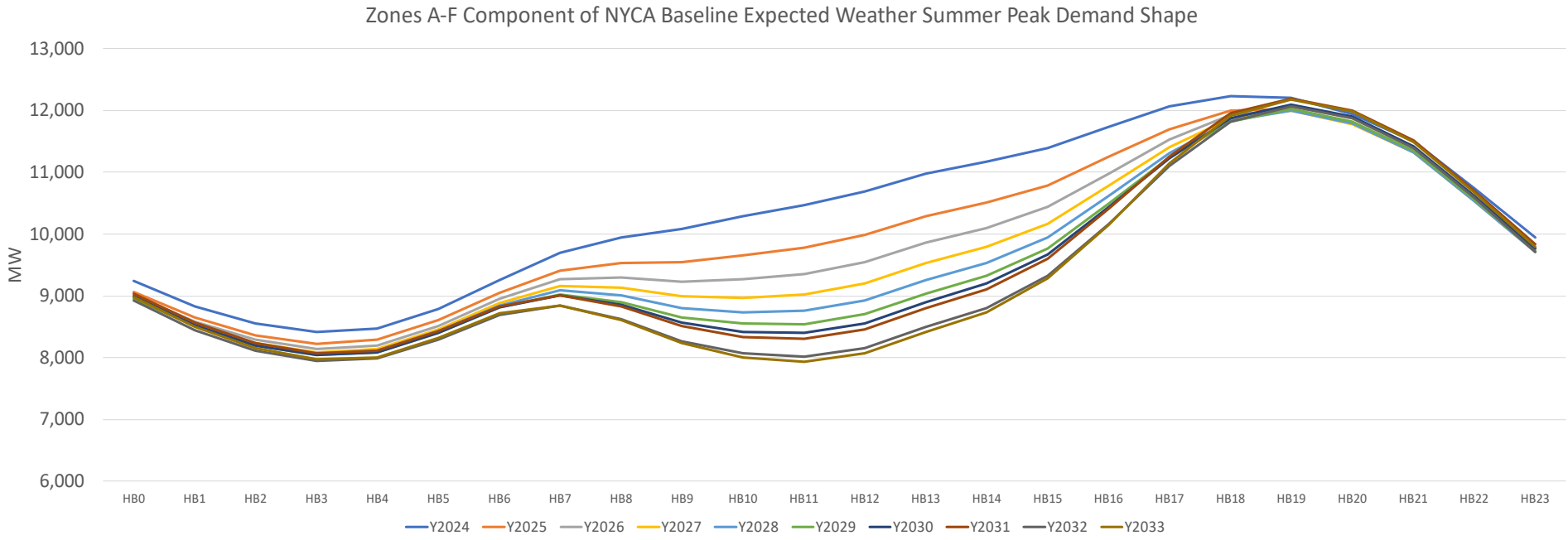

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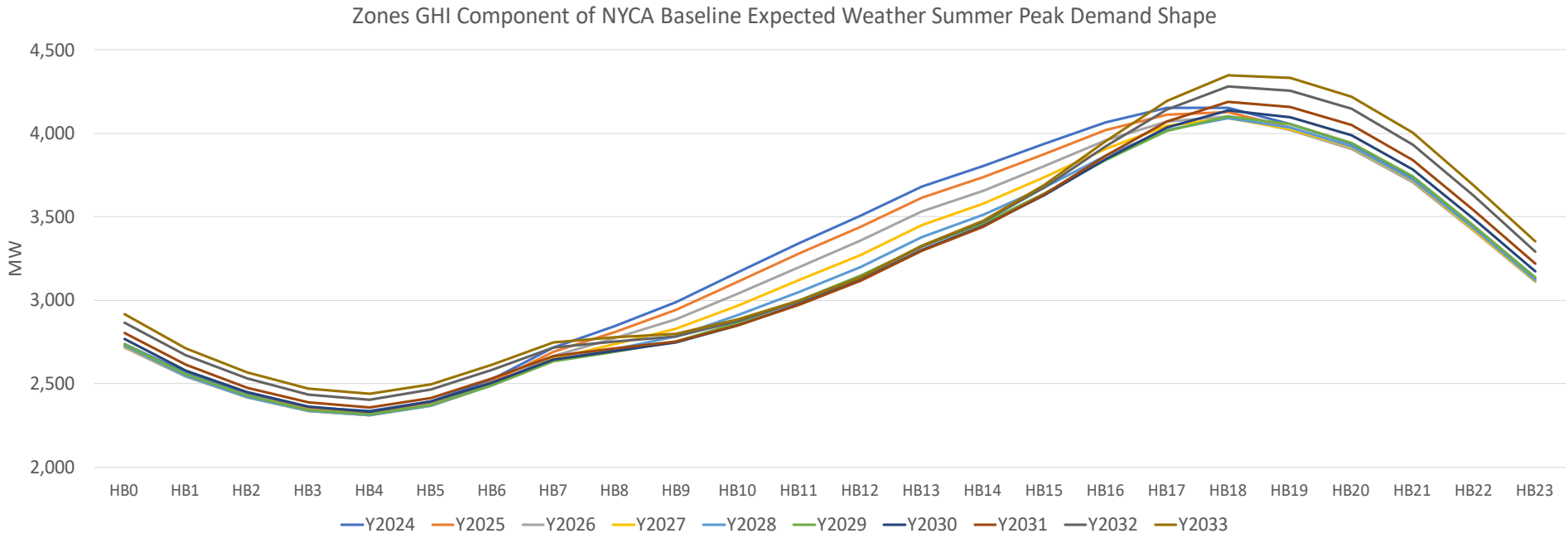

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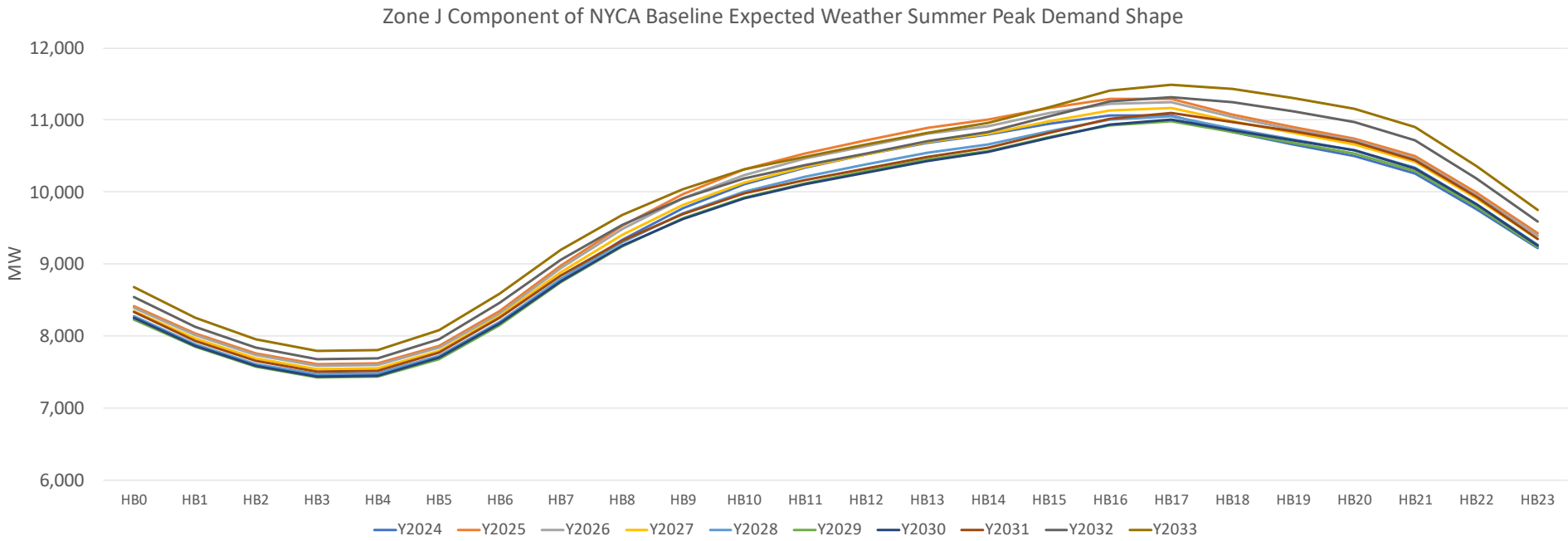

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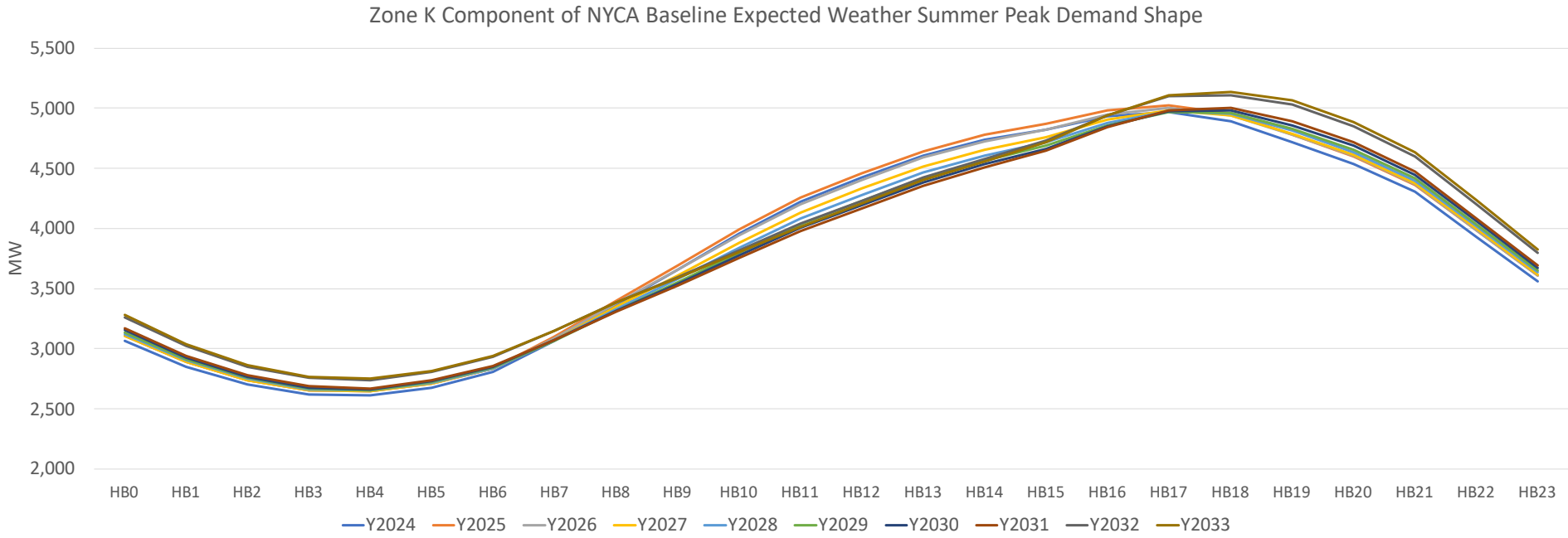

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Questions?

Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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