New York ISO
Independent System Operator

2024 Preliminary Baseline Forecast

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Demand Forecasting & Analysis

LFTF/ESPWG

April 4, 2024

Agenda

- Forecast Methodology
- Forecast Assumptions
- 10-year Summer Peak Forecast
- 10-year Winter Peak Forecast
- 10-year Annual Energy Forecast
- 30-year Forecast Summary
- 2024 Forecast Scenarios

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Forecast Methodology

Base Load Forecast: Statistically Adjusted End-Use (SAE) models – account for:

- Economic and demographic trends
- Weather trends
- Appliance saturation and efficiency trends
- Recent load growth trends

Load reducing modifiers:

- Additional energy efficiency savings
- BTM solar impacts
- BTM distributed generation impacts
- BTM storage peak reductions

Load increasing modifiers:

- Electric vehicle impacts
- Heating, cooling, and base load electrification
- Large load projects
- Storage net energy consumption

Final Peak and Energy Forecasts - Itron Metrix LT software:

- Compilation of 8,760 load shapes for base load and all technologies/load modifiers
- Dynamic calculation of peak load forecast based on the 8,760 shapes
- Additional information is considered, including forecasts from Transmission Owners

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Forecast Assumptions – Prior Presentations

- Baseline Economic forecast (derived from Moody's Analytics data) - presentation
- Energy Efficiency; and Behind-the-Meter Solar, Distributed Generation, and Energy Storage forecasts - presentation
- Electric Vehicle forecast update – presentation
- Building Electrification assumptions – presentation

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Forecast Assumptions – Large Loads

Table I-14: Interconnecting Large Loads Forecast

Reflects Cumulative Existing and Future Load Impacts of Large Load Projects

Summer Peak Demand by Zone - MW

Year	A	B	C	D	E	F	NYCA
2024	188	0	0	169	11	0	368
2025	288	150	0	173	19	0	630
2026	348	248	122	352	21	0	1,091
2027	348	248	218	534	21	40	1,409
2028	348	248	338	534	21	40	1,529
2029	348	248	492	534	21	40	1,683
2030	348	248	703	534	21	40	1,894
2031	348	248	818	534	21	40	2,009
2032	348	248	933	534	21	40	2,124
2033	348	248	1,048	534	21	40	2,239
2034	348	248	1,077	534	21	40	2,268

Winter Peak Demand by Zone - MW

Year	A	B	C	D	E	F	NYCA
2024-25	188	0	0	173	11	0	372
2025-26	288	150	0	324	21	0	783
2026-27	348	248	122	462	21	0	1,201
2027-28	348	248	218	534	21	40	1,409
2028-29	348	248	338	534	21	40	1,529
2029-30	348	248	492	534	21	40	1,683
2030-31	348	248	703	534	21	40	1,894
2031-32	348	248	818	534	21	40	2,009
2032-33	348	248	933	534	21	40	2,124
2033-34	348	248	1,048	534	21	40	2,239
2034-35	348	248	1,077	534	21	40	2,268

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Summer Peak Forecast

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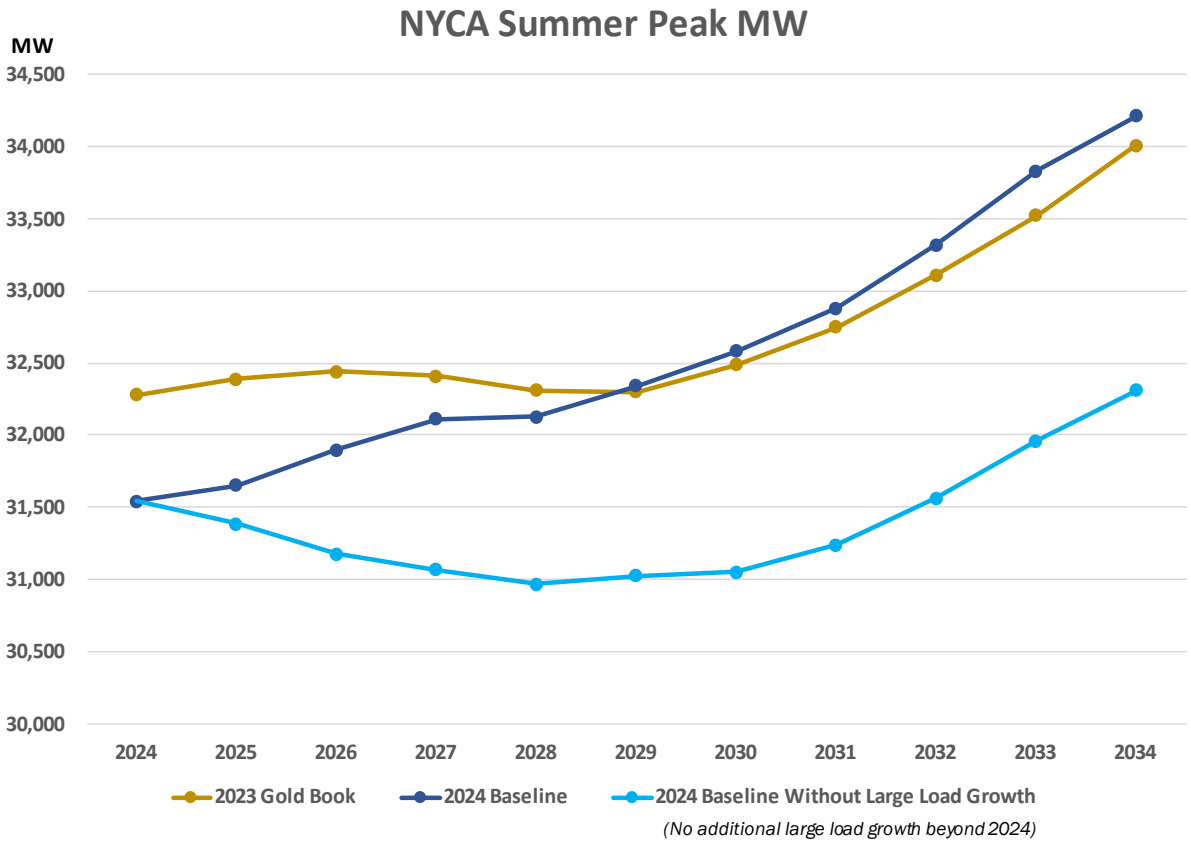
NYCA Baseline Summer Peak Forecast



Summer	23 GB	24 Baseline
2024	32,280	31,541
2025	32,390	31,650
2026	32,440	31,900
2027	32,410	32,110
2028	32,310	32,130
2029	32,300	32,340
2030	32,490	32,580
2031	32,750	32,880
2032	33,110	33,320
2033	33,520	33,830
2034	34,010	34,210

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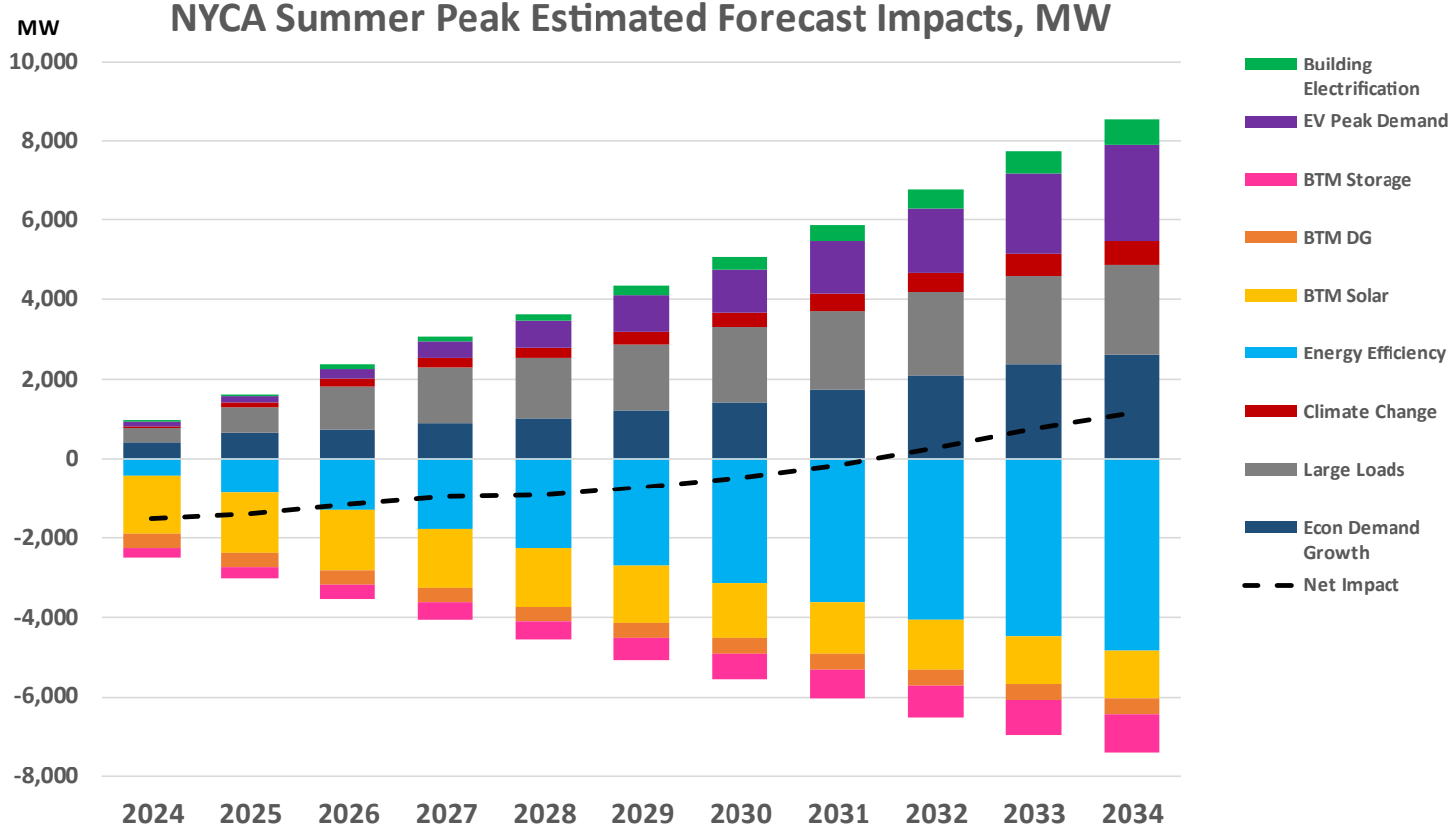
NYCA Summer Peak Estimated Forecast Impacts, MW



	Economy	Large Loads	Climate	EE	BTM Solar	BTM DG	BTM Storage	EV	Electrification	Net Growth
Annual Impact:	*0.8%*	*0.7%*	*0.2%*	*-1.4%*	*-0.3%*	*-0.1%*	*-0.3%*	*0.7%*	*0.2%*	*0.3%*

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

Reflects Impacts of Energy Saving Programs, Behind-the-Meter Generation, Electrification, & Large Loads

Coincident Summer Peak Demand by Zone - MW

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2024	2,742	1,858	2,622	686	1,335	2,327	2,147	610	1,329	10,922	4,963	31,541
2025	2,821	1,969	2,559	689	1,317	2,273	2,157	615	1,334	10,960	4,956	31,650
2026	2,853	2,000	2,598	871	1,276	2,229	2,167	620	1,341	10,990	4,955	31,900
2027	2,835	1,993	2,612	1,050	1,238	2,235	2,183	625	1,351	11,020	4,968	32,110
2028	2,799	1,968	2,639	1,051	1,222	2,225	2,209	632	1,363	11,040	4,982	32,130
2029	2,770	1,951	2,790	1,054	1,218	2,225	2,251	642	1,380	11,050	5,009	32,340
2030	2,752	1,942	2,940	1,054	1,216	2,232	2,287	652	1,395	11,080	5,030	32,580
2031	2,763	1,944	3,044	1,055	1,220	2,245	2,329	663	1,413	11,130	5,074	32,880
2032	2,789	1,955	3,189	1,057	1,230	2,270	2,375	676	1,430	11,220	5,129	33,320
2033	2,826	1,977	3,310	1,060	1,253	2,308	2,438	691	1,452	11,310	5,205	33,830
2034	2,858	1,989	3,361	1,064	1,275	2,339	2,488	706	1,472	11,390	5,268	34,210

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Winter Peak Forecast

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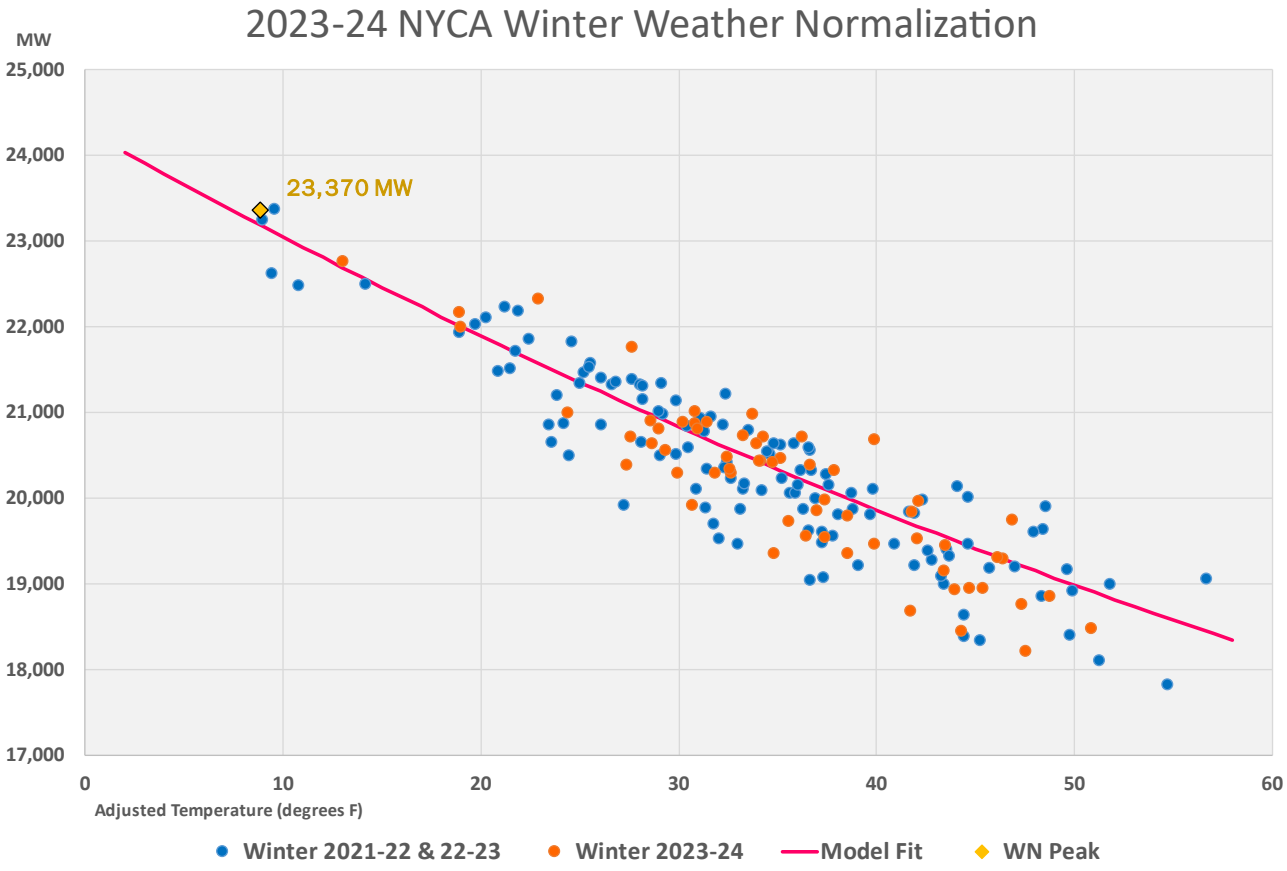
Winter Weather Normalization



- NYCA-level regression model
- Regress winter weekday peak MW against adjusted temperature
- Adjusted temperature accounts for dry bulb and wind chill, with values similar to daily average temperature
- December through February data for the 2021-22, 2022-23, and 2023-24 winters
- Binaries for February and the 2021-22 and 2022-23 winters
- The NYCA weather normalized winter peak load for 2023-24 is *23,370 MW*

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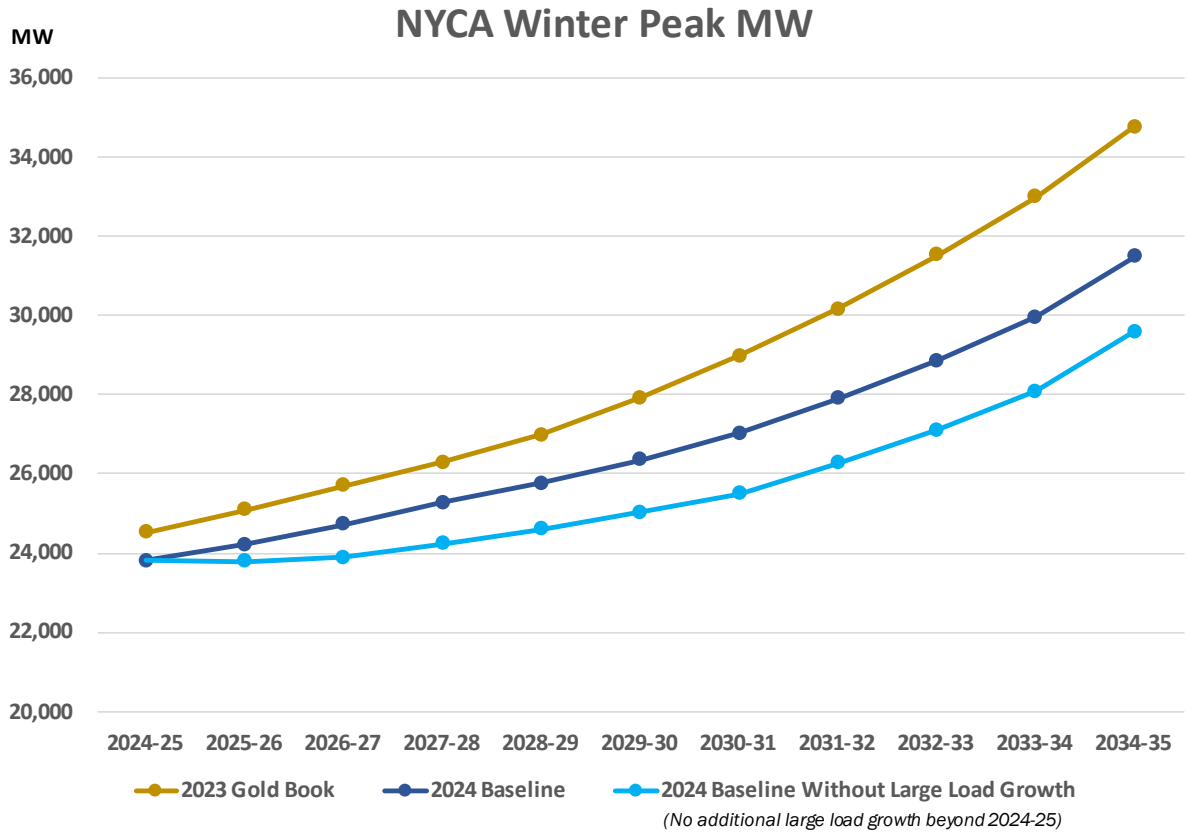
Baseline Winter Peak Forecast



Winter	23 GB	24 Baseline
2024-25	24,530	23,800
2025-26	25,100	24,210
2026-27	25,700	24,730
2027-28	26,300	25,270
2028-29	26,990	25,760
2029-30	27,920	26,350
2030-31	28,970	27,020
2031-32	30,160	27,900
2032-33	31,530	28,850
2033-34	32,980	29,950
2034-35	34,760	31,480

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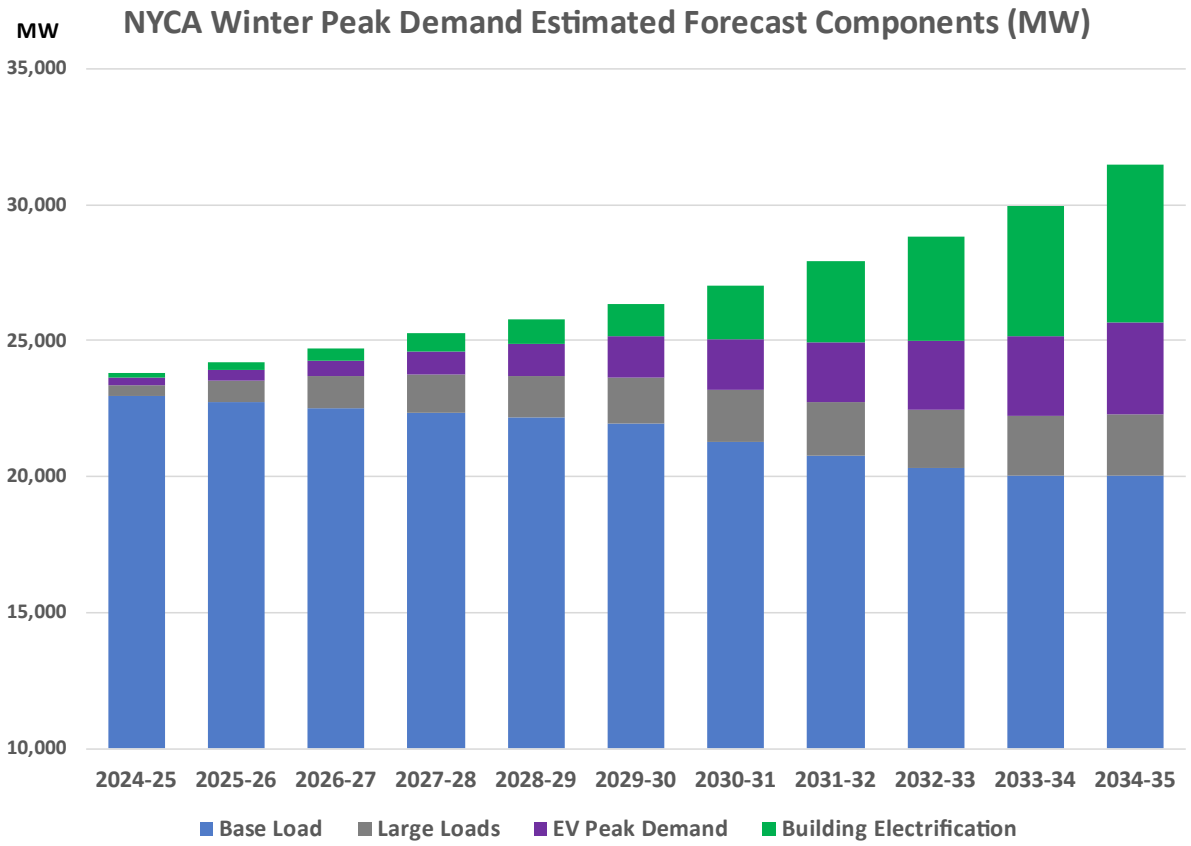

	Base Load	EV	Electrification	Large Loads	Net
Annual Impact:	*-1.1%*	*1.3%*	*2.2%*	*0.9%*	*2.9%*

Note – base load includes impacts of economic growth, climate trends, energy efficiency, and BTM distributed energy resources.

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Table I-3b: Baseline Winter Coincident Peak Demand Forecast

Reflects Impacts of Energy Saving Programs, Behind-the-Meter Generation, Electrification, & Large Loads

Coincident Winter Peak Demand by Zone - MW

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2024-25	2,196	1,514	2,513	860	1,283	1,923	1,506	508	876	7,350	3,271	23,800
2025-26	2,283	1,584	2,481	1,022	1,292	1,922	1,524	508	885	7,410	3,299	24,210
2026-27	2,348	1,626	2,587	1,169	1,289	1,931	1,548	512	896	7,490	3,334	24,730
2027-28	2,402	1,647	2,675	1,258	1,304	2,001	1,591	522	914	7,560	3,396	25,270
2028-29	2,444	1,670	2,797	1,259	1,323	2,037	1,640	532	933	7,660	3,465	25,760
2029-30	2,499	1,700	2,941	1,263	1,349	2,083	1,700	537	955	7,770	3,553	26,350
2030-31	2,574	1,738	3,121	1,263	1,376	2,124	1,760	542	973	7,910	3,639	27,020
2031-32	2,669	1,789	3,232	1,264	1,414	2,179	1,832	543	998	8,230	3,750	27,900
2032-33	2,755	1,833	3,389	1,267	1,457	2,240	1,910	552	1,027	8,540	3,880	28,850
2033-34	2,882	1,908	3,570	1,271	1,523	2,340	2,020	576	1,072	8,730	4,058	29,950
2034-35	3,029	1,995	3,728	1,276	1,601	2,458	2,148	604	1,125	9,250	4,266	31,480

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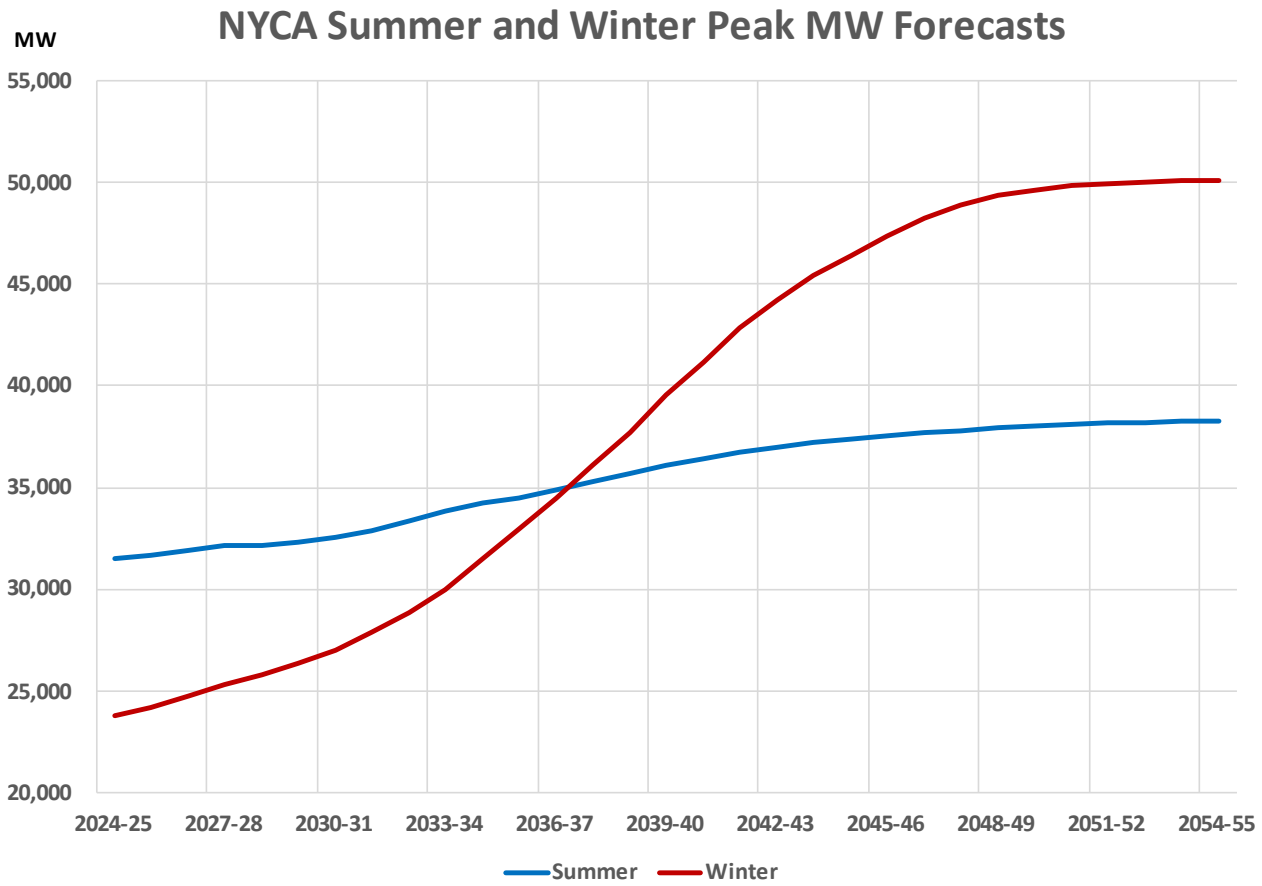

Due primarily to updates in heating electrification assumptions, the crossover to winter peak is now projected to occur around 2037-38. However, there is a large degree of uncertainty as to the exact timing of the switch to a winter-peaking system.

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Annual Energy Forecast

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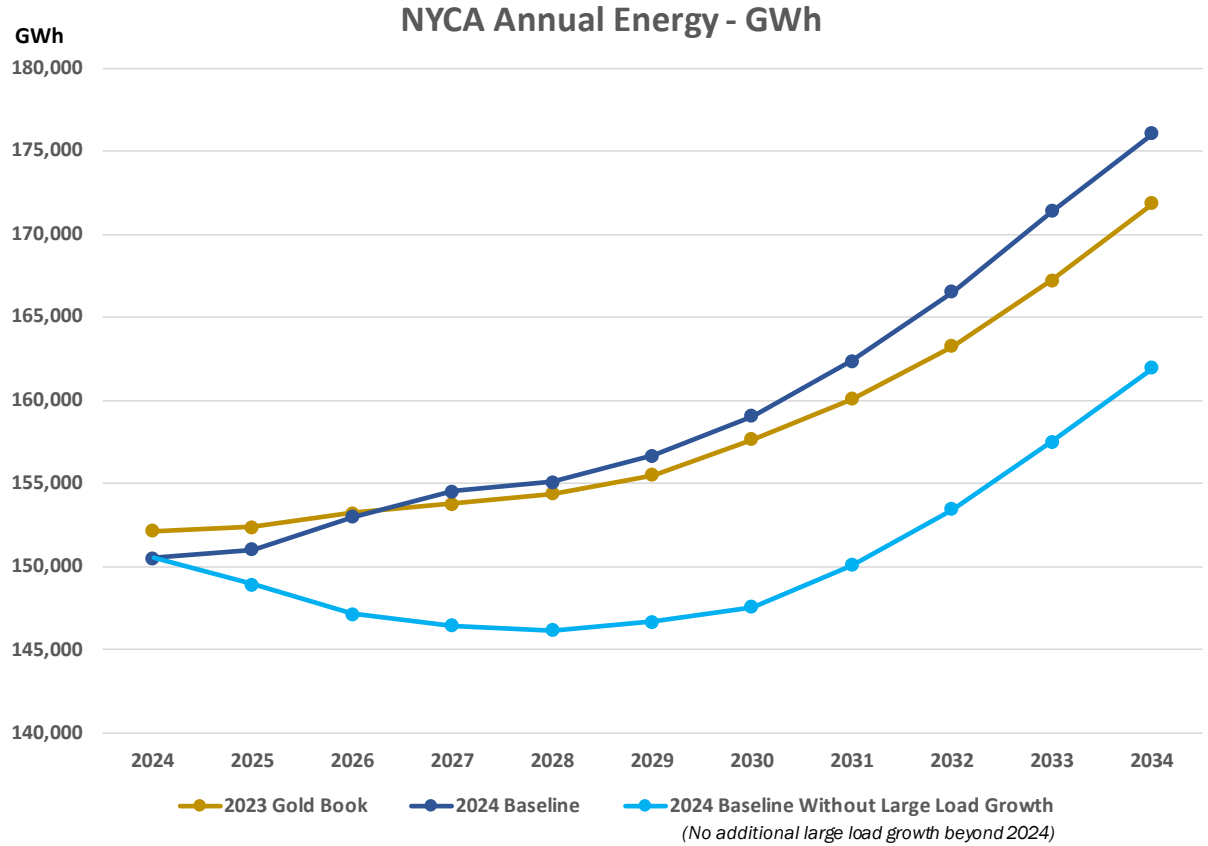
Preliminary Annual Energy Forecast



Year	23 GB	24 Baseline
2024	152,140	150,540
2025	152,390	151,020
2026	153,250	152,990
2027	153,780	154,530
2028	154,390	155,100
2029	155,530	156,660
2030	157,660	159,050
2031	160,100	162,360
2032	163,260	166,530
2033	167,220	171,380
2034	171,840	176,040

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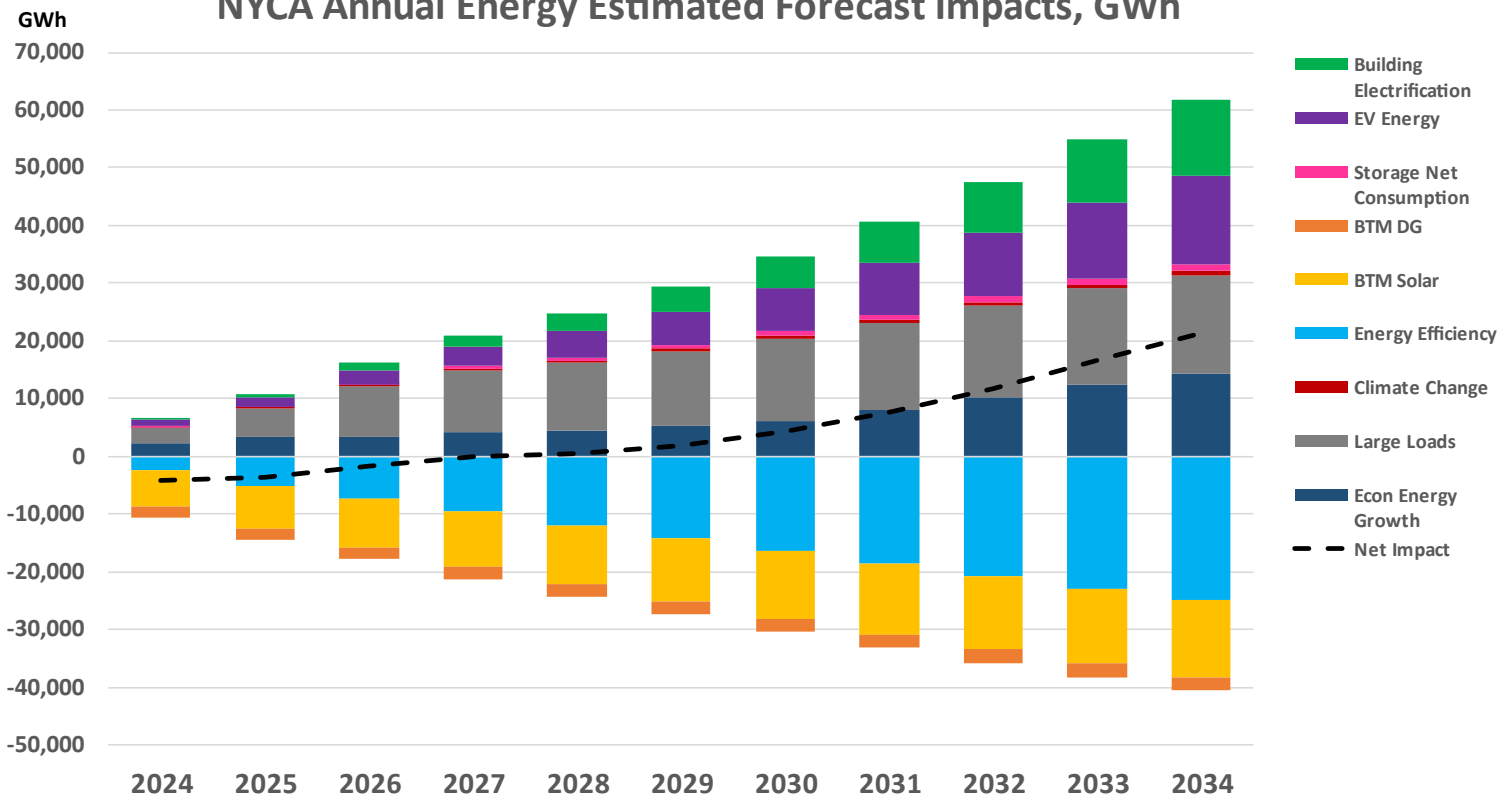
NYCA Annual Energy Estimated Forecast Impacts, GWh



	Economy	Large Loads	Climate	EE	BTM Solar	BTM DG	BTM Storage	EV	Electrification	Net Growth
Annual Impact:	*0.9%*	*1.0%*	*0.04%*	*-1.5%*	*-0.8%*	*-0.1%*	*0.1%*	*0.9%*	*0.8%*	*1.3%*

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Table I-2: Baseline Annual Energy, Historical and Forecast

Reflects Impacts of Energy Saving Programs, Behind-the-Meter Generation, Electrification, & Large Loads

Annual Energy by Zone - GWh

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2024	15,490	9,300	14,950	5,770	7,190	11,300	9,220	2,760	5,500	49,260	19,800	150,540
2025	15,960	10,000	14,590	5,850	7,010	11,030	9,230	2,740	5,530	49,210	19,870	151,020
2026	16,100	10,330	14,810	7,380	6,740	10,780	9,280	2,740	5,560	49,290	19,980	152,990
2027	15,950	10,310	14,890	8,640	6,530	10,730	9,380	2,760	5,610	49,560	20,170	154,530
2028	15,750	10,100	15,260	8,650	6,390	10,770	9,510	2,780	5,670	49,830	20,390	155,100
2029	15,670	9,990	16,160	8,680	6,320	10,730	9,690	2,830	5,750	50,170	20,670	156,660
2030	15,710	9,970	17,260	8,680	6,330	10,810	9,920	2,890	5,850	50,640	20,990	159,050
2031	15,950	10,110	18,160	8,690	6,450	11,040	10,220	2,970	5,990	51,360	21,420	162,360
2032	16,320	10,340	19,290	8,710	6,650	11,370	10,550	3,070	6,150	52,200	21,880	166,530
2033	16,810	10,670	20,520	8,740	6,910	11,810	10,920	3,180	6,320	53,090	22,410	171,380
2034	17,350	11,030	21,230	8,770	7,220	12,290	11,320	3,300	6,510	54,050	22,970	176,040

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30-Year Forecast Summary

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NYCA Summary of 2035 to 2055 Forecasts

Reflects Impacts of Energy Saving Programs, Behind-the-Meter Generation, Electrification, & Large Loads

Year	Energy (GWh)	Summer Peak (MW)
2035	180,640	34,520
2036	185,190	34,870
2037	189,800	35,280
2038	194,470	35,700
2039	199,390	36,100
2040	204,080	36,450
2041	208,540	36,740
2042	212,740	37,000
2043	216,910	37,210
2044	220,660	37,400
2045	223,970	37,570
2046	226,610	37,710
2047	228,970	37,820
2048	230,680	37,910
2049	232,030	38,000
2050	232,860	38,080
2051	233,690	38,160
2052	234,030	38,210
2053	234,210	38,260
2054	234,110	38,300

Winter	Winter Peak (MW)
2035-36	32,990
2036-37	34,490
2037-38	36,100
2038-39	37,740
2039-40	39,520
2040-41	41,200
2041-42	42,850
2042-43	44,200
2043-44	45,410
2044-45	46,430
2045-46	47,400
2046-47	48,230
2047-48	48,880
2048-49	49,350
2049-50	49,640
2050-51	49,840
2051-52	49,950
2052-53	50,040
2053-54	50,080
2054-55	50,110

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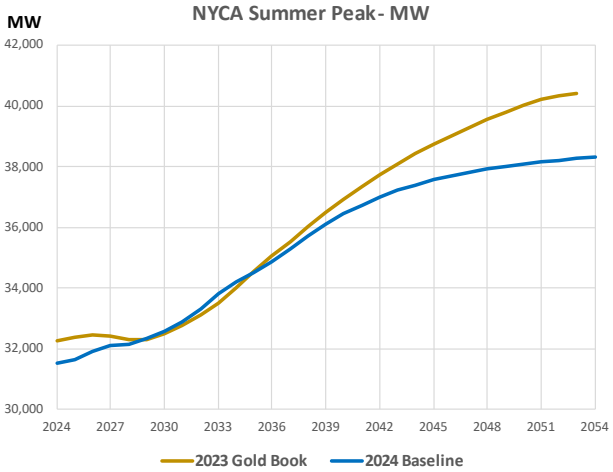

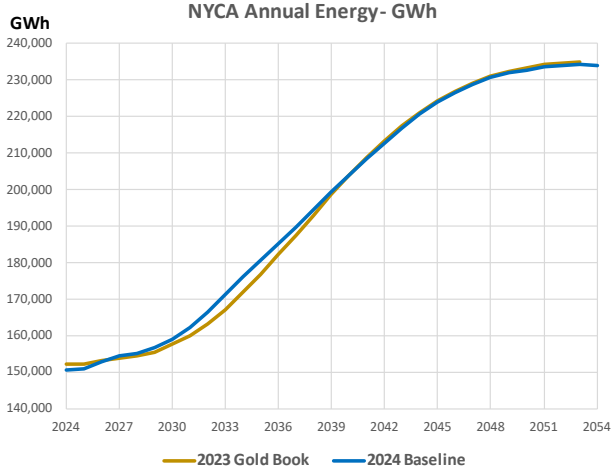

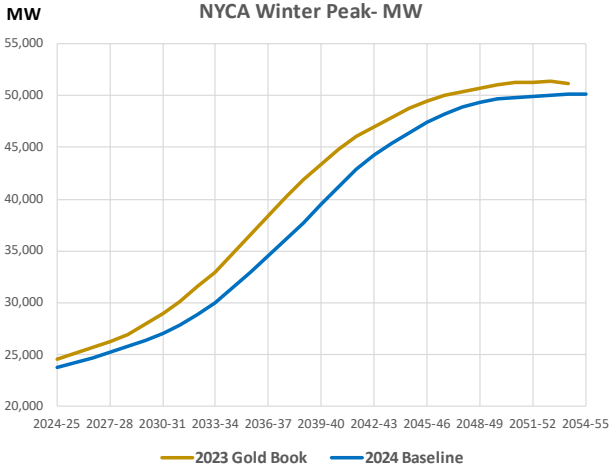

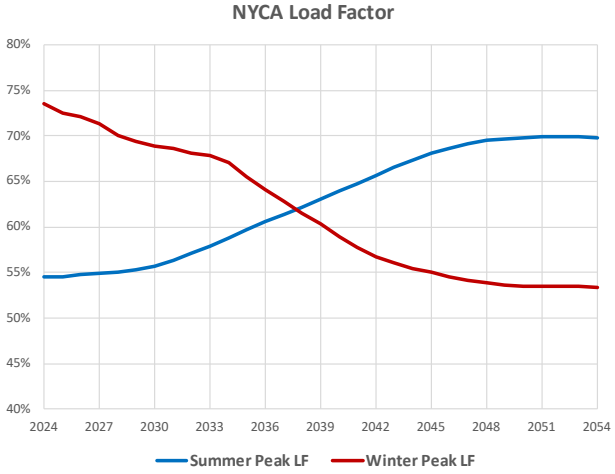

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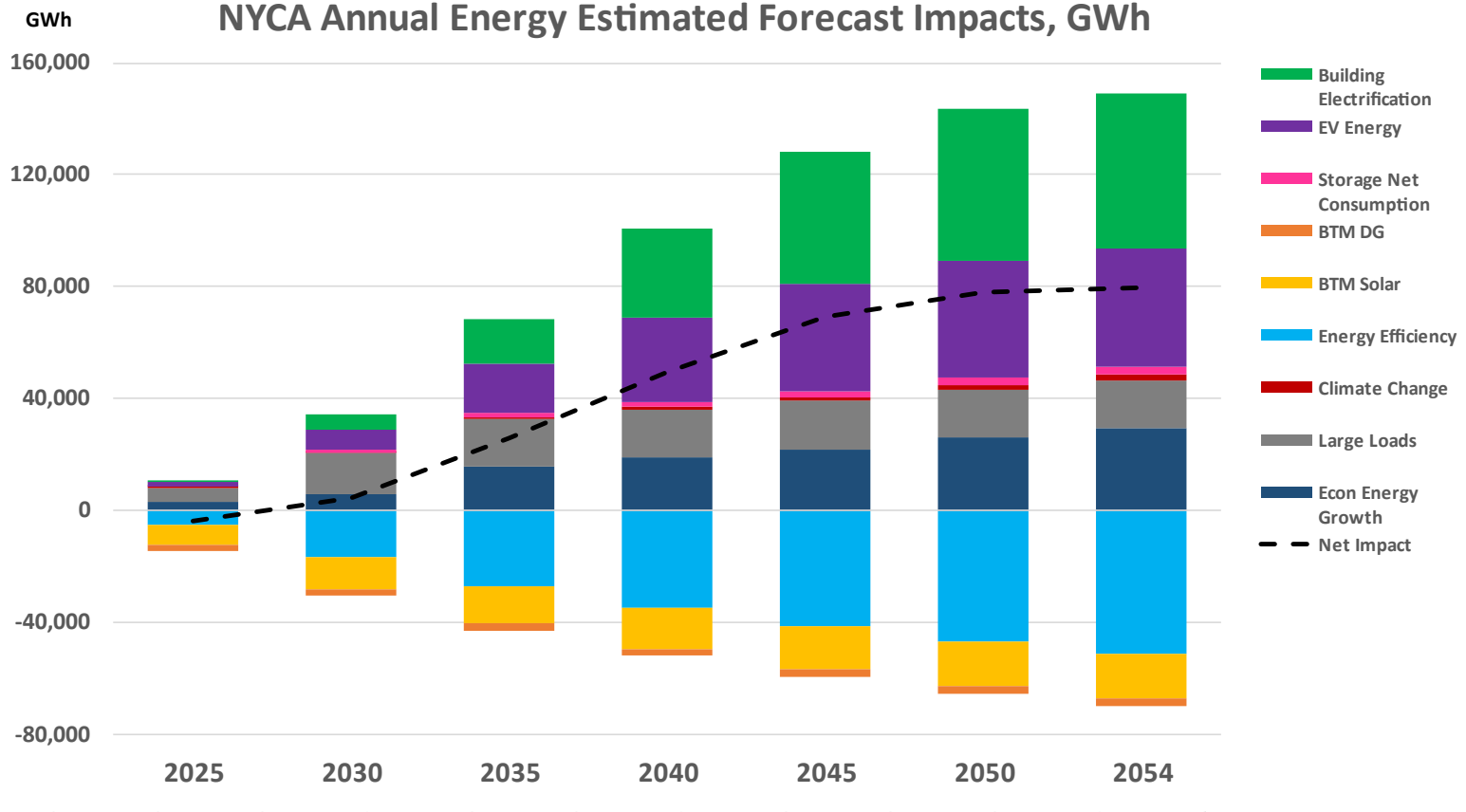
NYCA Annual Energy Estimated Forecast Impacts, GWh



	Economy	Large Loads	Climate	EE	BTM Solar	BTM DG	BTM Storage	EV	Electrification	Net Growth
Annual Impact:	*0.7%*	*0.4%*	*0.04%*	*-1.1%*	*-0.4%*	*-0.1%*	*0.1%*	*0.9%*	*1.2%*	*1.8%*

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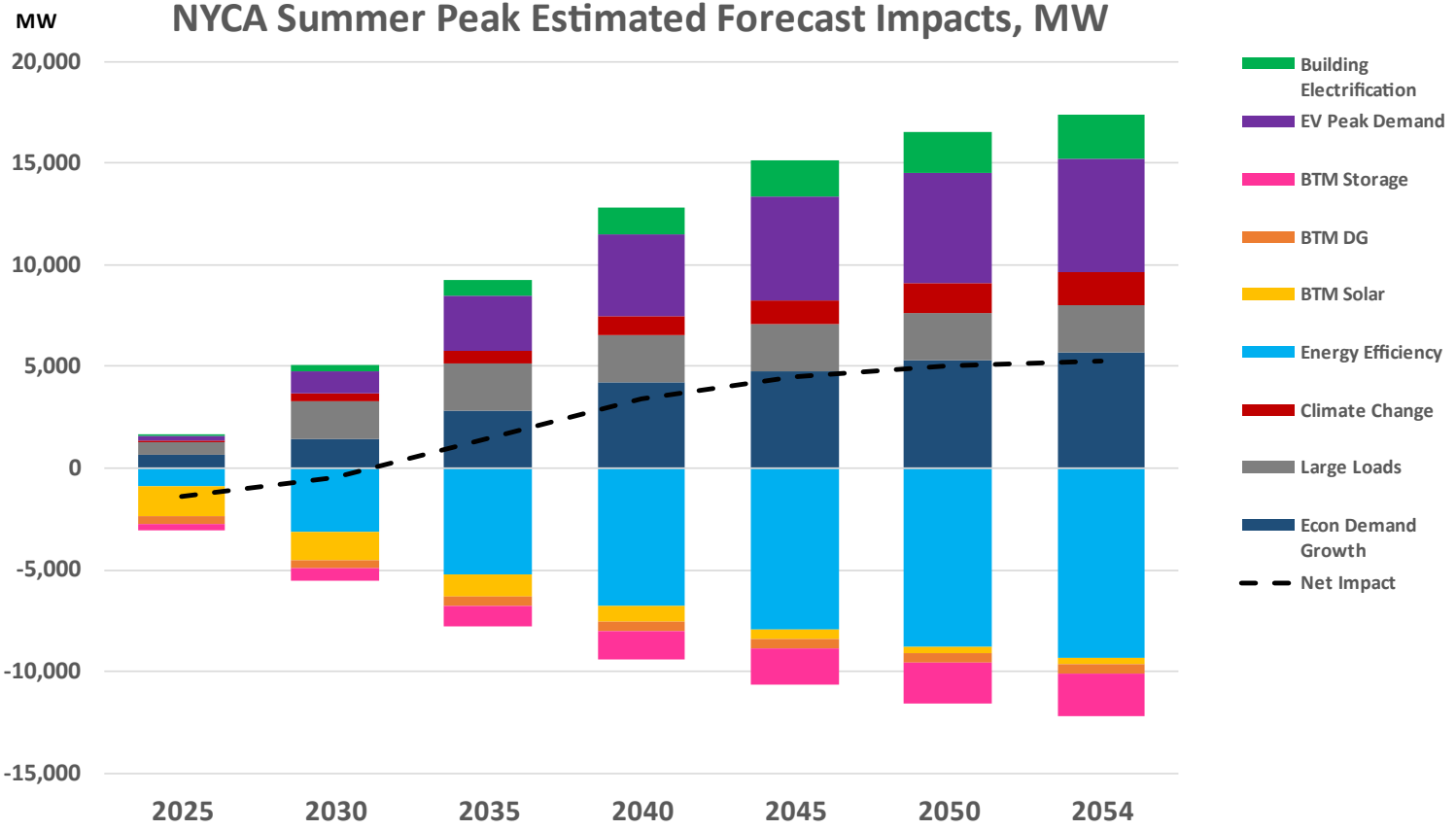
NYCA Summer Peak Estimated Forecast Impacts, MW



	Economy	Large Loads	Climate	EE	BTM Solar	BTM DG	BTM Storage	EV	Electrification	Net Growth
Annual Impact:	*0.6%*	*0.2%*	*0.2%*	*-1.0%*	*-0.03%*	*0.0%*	*-0.2%*	*0.6%*	*0.2%*	*0.6%*

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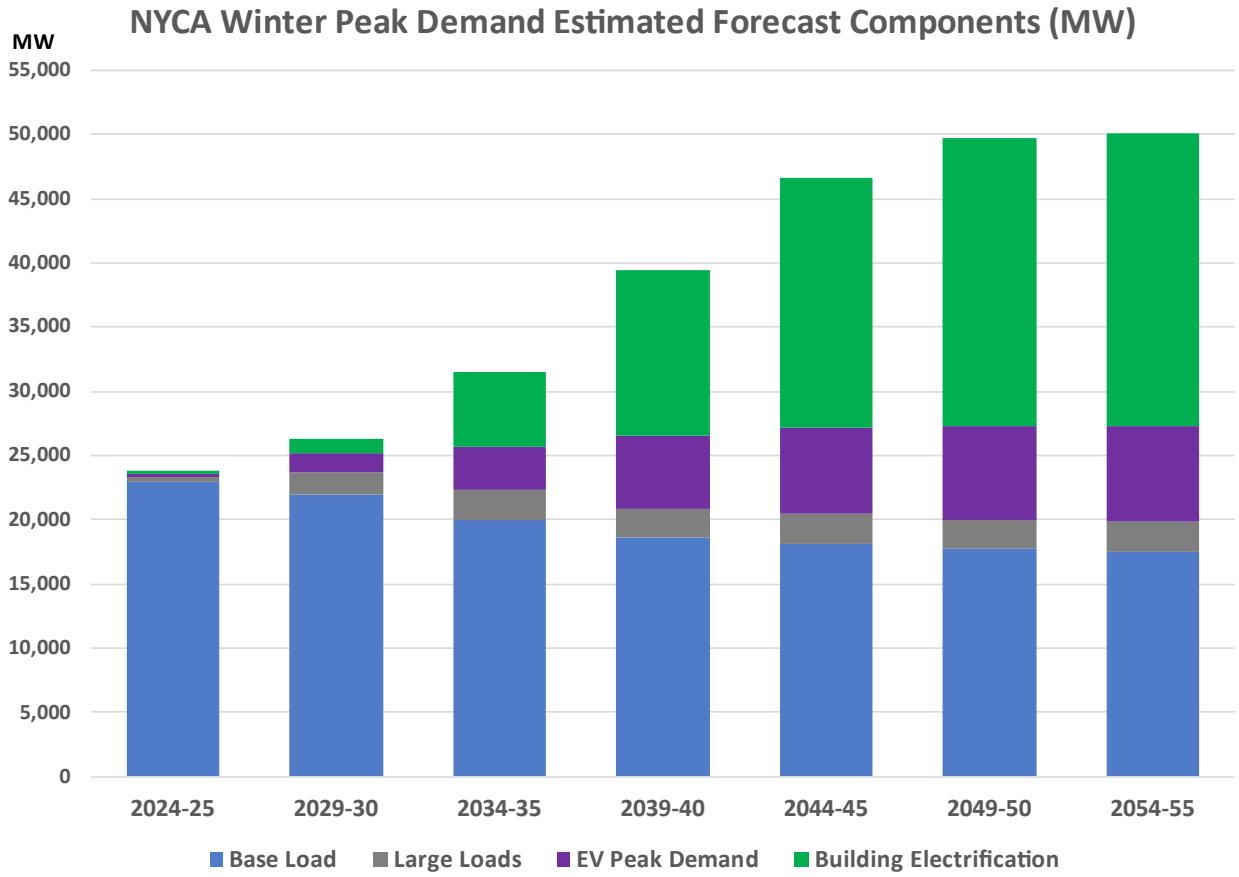

	Base Load	EV	Electrification	Large Loads	Net
Annual Impact:	*-0.8%*	*1.0%*	*3.2%*	*0.3%*	*3.7%*

Note – base load includes impacts of economic growth, climate trends, energy efficiency, and BTM distributed energy resources.

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2024 Forecast Scenarios

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Planned 2024 Gold Book Scenarios

- **Lower Demand Scenario**
  - *Slower economic growth than the baseline forecast*
  - *Slower Electric Vehicle (EV) adoption rate than the baseline forecast, with a greater share of managed charging*
  - *Lower saturation of electric heating compared to the baseline*
  - *Energy efficiency, Behind-the-Meter (BTM) solar, distributed generation, storage, and large load forecasts are same as the baseline*
- **Higher Demand Scenario**
  - *Faster economic growth than the baseline forecast, with population increase across the forecast horizon*
  - *100% Light Duty Vehicle (LDV) and Medium & Heavy Duty Vehicle (MHDV) EV sales shares in 2035 & 2045 respectively. Lower share of managed charging than in the baseline*
  - *85% penetration of primary residential electric heating by 2050*
  - *Additional large load growth beyond that included in the baseline forecast, including potential economic "multiplier" effects*
  - *Energy efficiency, BTM solar, distributed generation, and storage forecasts are same as the baseline*
- **Policy scenario**
  - *Intends to meet all New York State policy targets*
  - *Additional energy efficiency savings including building shell improvements, and flexible load such as managed EV charging*
  - *Large load, BTM solar, distributed generation, and storage forecasts are same as the baseline*

Note: The higher demand and policy scenarios will likely include electrolysis impacts (clean hydrogen production)

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Questions?

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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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