All-Electric Building Act

The impact of the AEBA on New York State's grid

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About this report

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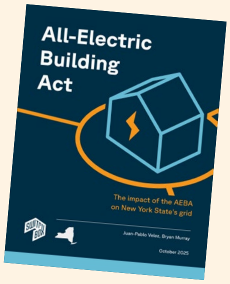

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Table of Contents

Introduction

In May 2023, New York became the first state to pass a law requiring all new buildings to be all-electric: the **All-Electric Building Act** (AEBA).

On January 1, 2026, the first part of the AEBA will take effect: residential buildings seven stories or fewer will be required to be all-electric, as will commercial and industrial buildings 100,000 square feet or less.[1]

As the state looks ahead to the launch of the nation's first all-electric new construction standard, Switchbox is releasing this analysis of the AEBA's impact on New York's electric grid.

In the wake of two grid reliability reports from the New York Independent System Operator (NYISO),[2] moderate Democrats in the New York State Assembly are pushing Gov. Hochul to delay implementing the AEBA she signed into law in 2023.[3]

Claiming that "NYISO has flagged serious [grid reliability] concerns that warrant a more cautious approach," moderate Democrats in the New York State Assembly have sent a letter to Gov. Kathy Hochul, asking her to "suspend enforcement of the new building electrification requirement" until the state "evaluates grid readiness under high electrification".[4]

Despite asserting that NYISO's recent reliability reports warrant delaying the AEBA's implementation, the letter includes no analysis of how the law—which only applies to *new* buildings—would actually affect the grid.

To shed some light on the grid impacts of the AEBA, this report seeks to answer the following questions:

- Will the AEBA actually spur "high electrification", given the state's expected pace of new construction?
- How will the AEBA actually affect the grid?

1 The AEBA will apply to all new buildings, with a few exemptions, starting on January 1, 2029; see §11-104-6(b) of the New York State Energy Conservation Construction Code.

2 The Q3 STAR report (NYISO 2025b), which identifies reliability risks over the next five years, and the Comprehensive Reliability Plan 2025-2034 (NYISO 2025c), which looks at the next decade.

3 As first reported by Spectrum News (Lisa 2025).

4 The sign-on letter (Conrad 2025) was authored by Assemblymember William Conrad (D-AD 140).

Executive Summary

Analyzing data from NYISO and the Census Bureau, this report finds that:

- AEBA will increase electricity use from buildings in winter, not summer. Virtually all new buildings already have air-conditioning.
- Today, New York's grid has significant spare capacity in the winter: the winter peak is only **77%** of the summer peak.
- The short-term reliability risks identified by NYISO—for the next five years—are all associated with the summer peak.
- Therefore, the AEBA will not contribute to short-term reliability risks. Rather, it will make better use of the grid's spare winter capacity.
- Over the long term, a growing winter peak, driven partly by heating electrification, will eventually exceed the summer peak. (NYISO's estimates vary on when this will happen, but no sooner than 2035.)
- However, given New York's current and expected pace of new construction, the AEBA will be responsible for only **7%** of the winter peak growth forecasted by NYISO (in their baseline scenario).

Findings

AEBA WILL INCREASE ELECTRICITY USE IN WINTER, NOT SUMMER

Starting on January 1, 2026, the All-Electric Building Act requires all new buildings seven stories or fewer to install all-electric appliances.

Most appliances are already electric, so this requirement will only affect those that sometimes consume fossil fuels: stoves, water heaters, and heating systems.

Stoves and water heaters are used year-round, but they consume a negligible amount of electricity: over the course of a month, a heat pump water heater and an induction stove each use around a tenth of the power it takes to cool a home during the summer.[5]

The electrification of these appliances in new construction would therefore not add a significant load to the grid during the summer.

Compared to these end-uses, heat pumps consume a significant amount of electricity to provide **heating**. But they do so only during the winter, when the grid has significant spare capacity (see p. 7).

Heat pumps can also provide **cooling**, however. By spurring the adoption of heat pumps in new buildings, would the AEBA therefore increase electricity use during the summer peak, when the grid is most stressed?

No, because the vast majority of new buildings are already built with air-conditioning.[6]

In fact, NYISO's building electrification summer peak forecasts show no impact from heat pump adoption: "Increases in electric cooling from heat pumps are largely offset by decreasing saturations of central and room air conditioning."[7]

To sum up: The reliability risks identified by NYISO's recent reports are all associated with summer peaks, when the grid is most stressed. But the AEBA won't worsen the summer peak

5 A heat pump water heater and an induction stove consume approximately 75 kWh and 60 kWh a month, respectively. By comparison, a central air-conditioning unit in a typical American home consumes about 2,500 kWh per year—roughly 625 kWh per month during the summer.

6 88% of all homes in New York State had some form of air-conditioning (as of 2020); nationally, 98% of new homes were built with air-conditioning as of 2023.

7 See p. 3 in NYISO's 2025 Gold Book, which contains their updated load forecasts for New York's grid (NYISO 2025a).

with new cooling loads, because virtually all new buildings have air-conditioning already.

Instead, by replacing fossil fuel-burning appliances with electric ones, the AEBA will produce new buildings that consume more electricity during the *winter* than they would have otherwise.

Does New York's grid have enough spare winter capacity to handle this AEBA-induced load growth?

NEW YORK'S GRID HAS SIGNIFICANT SPARE CAPACITY IN THE WINTER

Over the past ten years, New York's grid-wide winter peak has averaged only 77% of the summer peak.

> "New York's grid-wide winter peak has averaged only 77% of the summer peak."

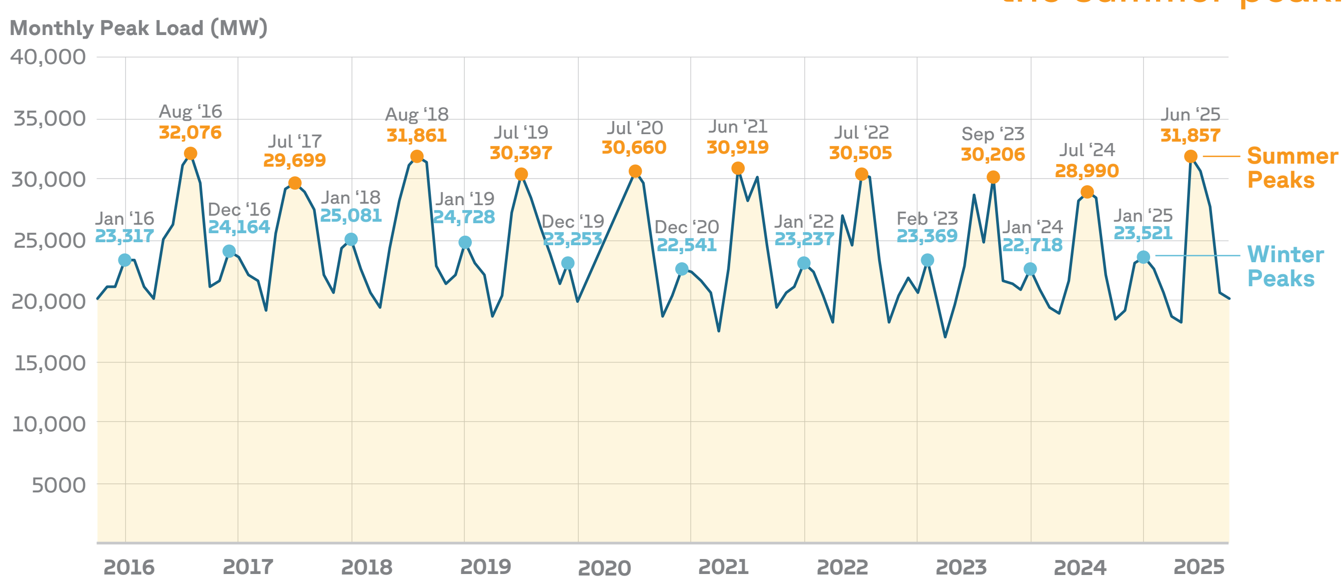

Figure 1: NYISO peak hourly load over the last ten years, showing New York's grid-wide winter and summer peaks. Source: NYISO.

In other words, at the level of **generation** and **transmission**, around a quarter of the grid's capacity goes unused during the winter.

And since the grid is already sized to handle these summer peaks, there's significant "headroom" for winter peaks to grow up to their level, using existing infrastructure.

What about at the **distribution** level of the grid?

A recent study by Synapse Energy Economics analyzed the capacity of New York's distribution grid to accommodate building electrification.

While the picture varies by utility, the distribution grid as a whole appears to have even more winter headroom than the bulk power grid:

Utility	Distribution winter peak (MW)	Total estimated winter headroom (MW)	Available winter capacity
National Grid	4,276	4,477	51%
Central Hudson	796	279	26%
NYSEG and RGE	3,786	3,235	46%
ConEd	4,691	1,346	22%
Orange & Rockland	1,123	1,071	49%
Total	**14,673**	**10,408**	**42%**

Table 1: Distribution grid winter headroom by utility, adapted from p. 4 of (Takahashi 2024) .

For instance, in Central Hudson, 26% of the distribution grid's winter capacity is currently unused. In National Grid, the figure is 51%.

The study concludes: "Existing distribution grids could support residential heat pumps reaching roughly 29 percent to 47 percent of the entire heating fuel stock… with the statewide average of 39 percent."[8]

8 See p. 4 of Synapse Energy Economics' distribution headroom report (Takahashi 2024).

Simply put: at present, New York's grid has significant spare winter capacity to accommodate heat pumps in new construction, without triggering reliability problems.

"New York's grid has significant spare winter capacity to accommodate heat pumps in new construction."

AEBA WILL CONTRIBUTE VERY LITTLE TO WINTER PEAK GROWTH

But what about over the long term?

Once the AEBA comes into effect, every new building built with heat pumps will indeed contribute to the winter peak.

In press interviews, Assemblymember William Conrad has voiced concerns that the AEBA could affect grid reliability in winter, presumably from its impact on the winter peak: "I don't want to have a blackout or a brownout because, especially in the winter, that's just something that I know my constituents and myself could not put up with."[9]

9 See recent Spectrum News article (Lisa 2025).

So let's examine how much the AEBA will contribute to winter peak growth.

NYISO's recently released long-term reliability report, mentioned prominently in the letter to Gov. Hochul, contains forecasts of how the winter peak will evolve through 2034.[10]

Just how quickly the winter peak will grow is uncertain: it depends not only on how quickly heat pumps are installed, but also on the pace at which EVs are adopted, and large loads such as data centers are built.

Note

To capture this uncertainty, NYISO has provided three scenarios:

- A *baseline* scenario, where "roughly 75% of residential homes use primary electric space heating by 2050, with similar large-scale adoption in the commercial sector."[11]
- A *low-demand* scenario, where 55% of buildings electrify by 2050
- A *high-demand* scenario, compliant with the State's climate goals, where over 95% of buildings electrify by 2050

But one thing is certain: the AEBA itself will contribute only very minorly to winter peak.

10 NYISO's Comprehensive Reliability Plan 2025-2034 (NYISO 2025c). relies on winter peak forecasts from NYISO's 2025 Gold Book (NYISO 2025a).

11 See p. 12 of NYISO's 2025 Gold Book (NYISO 2025a).

"AEBA itself will contribute only very minorly to winter peak.."

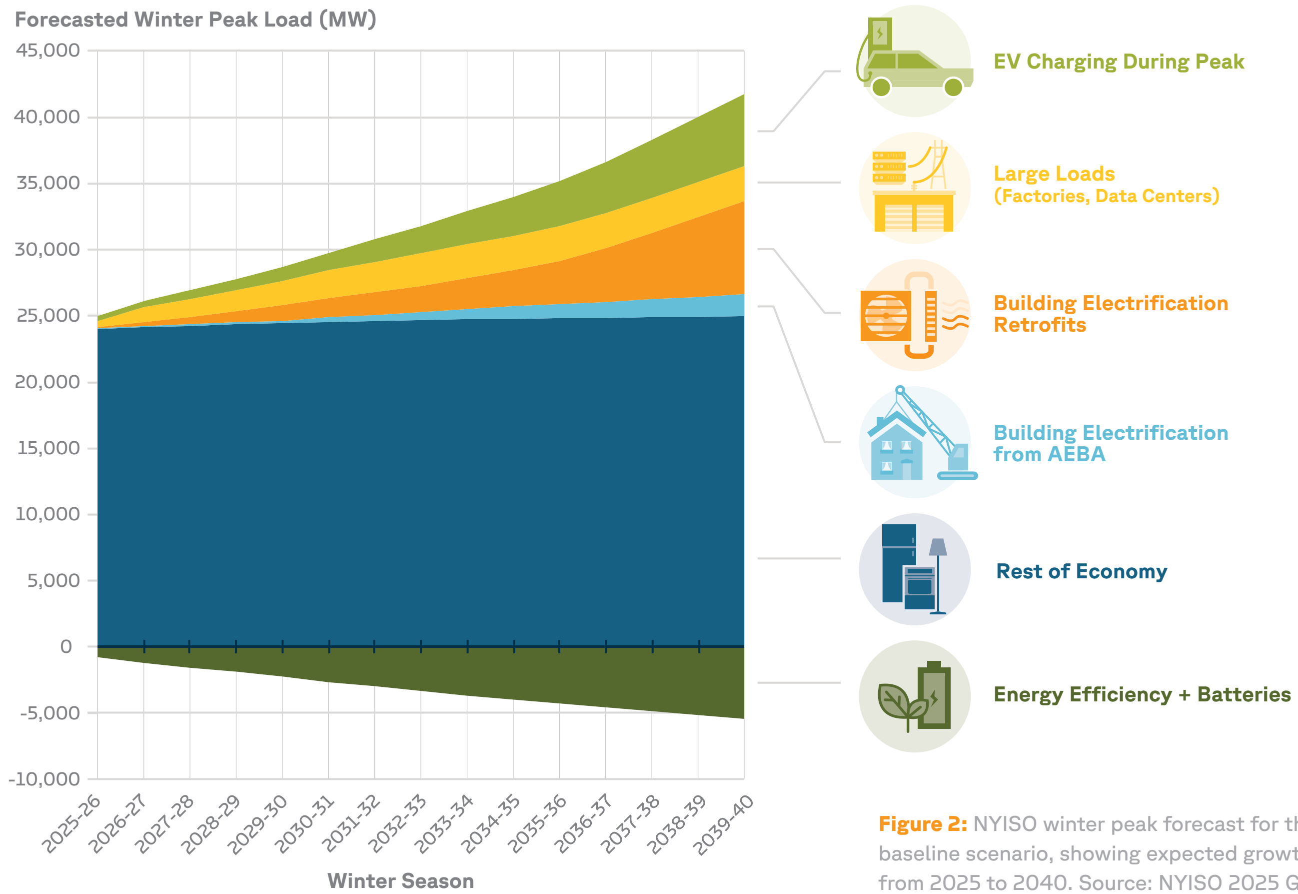

Figure 2: NYISO winter peak forecast for the baseline scenario, showing expected growth from 2025 to 2040. Source: NYISO 2025 Gold Book (Table I-1d), Switchbox analysis

Due to **building electrification**, **EV adoption**, and **new large loads** such as data centers, NYISO's baseline scenario expects the *gross* winter peak to grow from 25 GW in the winter of 2025–2026 to 47 GW in 2039–2040.

Our modeling estimates that the AEBA will contribute 1.6 GW to the winter peak in 2040, based on the state's current new construction rate.[12]

This represents only **7%** of the additional 21.5 GW of gross peak winter demand expected by 2040.

This *gross* peak demand would be **reduced** by 5.5 GW due to **energy efficiency and behind-the-meter battery storage**, for a *net* winter peak of 38 GW, not 47 GW.

In fact, these demand reductions would offset AEBA's impact on the winter peak in 2040 more than three times over.

The NYISO data reveals another fundamental fact: Building electrification is indeed the leading driver of winter peak growth, responsible for 62% of gross winter peak growth by

Year	New Housing Units
2021	41,530
2022	49,119
2023	45,561
2024	46,852

Table 2: New housing units per year in New York State, according to the Census Bureau.

12 Of 45,000 new housing units per year, according to housing unit data from the Census Bureau, and of one square foot of commercial space for every three square feet of new housing, according to p.2 of NYC Construction Outlook (NYBC 2023). This estimate does not change based on the NYISO scenario, only its share of total winter peak growth within the scenario.

2040. **But the overwhelming majority of this growth will be due to retrofits, not new construction.**

The AEBA represents only 19% of the winter peak growth expected from building electrification by 2040.[13] This is because the state's pace of new construction is modest, while the existing building stock is vast.

The bottom line: The AEBA will contribute only minorly to peak growth, **93%** of which will be driven by other trends: building electrification of existing buildings, the adoption of EVs, and the building of data centers and other large loads.

It has long been known that building and vehicle electrification will require upgrades to New York's grid. When they will be needed is unclear: The winter peak has not yet started to grow, due in part to the sluggish pace of building electrification.

But this much is clear: these upgrades will be needed regardless of whether the AEBA is implemented. And delaying the AEBA will not fundamentally shift *when* those upgrades are needed, given its tiny contribution to peak growth. That will be determined by far larger trends.

13 While these statements apply specifically to NYISO's baseline scenario, retrofits are the overwhelming driver of building electrification in every scenario.

Appendix

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DATA AND METHODS

This section documents the datasets, transformations, and assumptions underlying the three main findings.

"AEBA will increase electricity use in winter, not summer" section

For this section, we rely on published statistics cited inline and in margin notes next to the relevant statements. Specifically, we use:

- Residential air-conditioning prevalence in New York and the U.S. new-construction market.
- Typical monthly electricity use for heat pump water heaters and induction stoves.
- Typical annual electricity use for a central air conditioner, which we convert to a monthly figure during the cooling season by dividing annual kWh by an assumed four-month summer cooling period.

We do not transform the underlying statistics other than unit harmonization where needed (for example, converting an annual air-conditioning consumption estimate to an approximate monthly value for an apples-to-apples comparison with monthly appliance consumption).

Our objective is to compare magnitudes—year-round appliance end uses affected by AEBA (stoves, water heating) versus cooling loads—and to note that high air-conditioning saturation in new construction implies minimal incremental summer-peak impact from AEBA. All sources are cited in the margin notes adjacent to the relevant text and figures (see p. 7 and Figure 1).

"New York's grid has significant spare capacity in the winter" section

Bulk power (generation and transmission): We use hourly NYISO system load by zone from EnergyOnline's NYISO Hourly Actual Load dataset. From this source, we:

1. Aggregate hourly zone loads to obtain an hourly system load series for each timestamp.
2. For each calendar month in the analysis window (last ten years), identify the maximum hourly load (the monthly system peak hour).
3. Plot the monthly maxima time series to show seasonal patterns; the points in Figure 1 are the monthly peak hours constructed this way.
4. Highlight the winter and summer peaks in each calendar year.
5. Compute the winter-to-summer peak ratio shown in the text (77%), defined as the cross-year mean of (winter monthly maximum / summer monthly maximum). This expresses typical bulk-system winter headroom relative to summer peaks.

Distribution system: We summarize the findings from Synapse Energy Economics' report, *Assessing Distribution System Readiness for Building Electrification in New York* (Takahashi et al. 2024).

Our Table 1 is based on the report's Table 2, regarding winter distribution capacity by utility. We re-express their results as an intuitive share we refer to as *available winter capacity*.

Given each utility's reported winter peak and estimated winter headroom, we compute:

$$\text{available winter capacity} = \frac{\text{headroom}}{\text{winter peak + headroom}}$$

We report these shares alongside the underlying winter peak and headroom values by utility in Table 1. Minor differences versus the source may reflect rounding to whole megawatts.

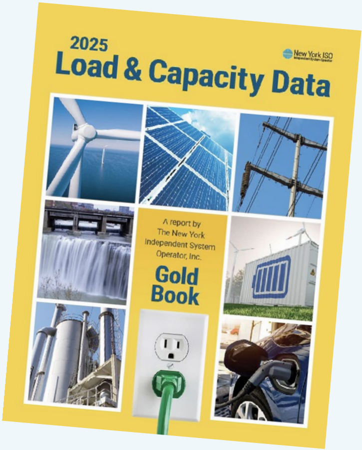
"AEBA will contribute very little to winter peak growth" section

Forecast baseline: We use NYISO's 2025 Gold Book baseline winter peak forecast (Table I-1d, available here) (NYISO 2025a) as the reference trajectory of gross winter peak demand through 2040. We then estimate the incremental winter peak attributable solely to AEBA (i.e., electrification in new construction mandated by the Act), independent of broader retrofit electrification.

AEBA increment assumptions and calculation:

- **New housing**: We assume 45,000 new housing units per year in New York State going forward, based on recent housing unit data (available here) from the Census Bureau (Census 2024). We further assume each new unit contributes 2.5 kW to the coincident winter peak (from heat-pump heating). This yields approximately 112 MW of incremental winter peak per year from residential AEBA compliance.
- **New commercial space**: Drawing on the NYC Construction Outlook (NYBC 2023), we assume one square foot of new commercial space for every three square feet of new housing. Applying a conservative conversion consistent with the residential assumption yields an additional 34 MW per year from commercial AEBA compliance.
- **Total AEBA increment**: This yields an AEBA increment of approximately 146 MW per year beginning in 2029, when the requirement applies to all new buildings. For 2026–2028, during which the requirement applies only to new buildings seven stories or fewer, we assume 25%

of this amount will come online (~37 MW/year). This assumption is based on the Census Building Permit Survey (data available here), which shows roughly three-quarters of new housing units in New York State are located in 5+ unit buildings, many of which may be over seven stories (Census 2025).



Attribution within NYISO's forecast: For each year, we compute the "AEBA increment"—the portion of winter peak attributable specifically to AEBA-driven new construction—based on the construction and end-use intensity assumptions above.

To distinguish new construction from retrofits, we use NYISO's baseline forecast of total winter peak growth (Table I-1d) and subtract our AEBA increment from the building-electrification component. This isolates the share of growth attributable to retrofits (i.e., existing building conversions) and other drivers.

We report both the absolute AEBA increment (e.g., 1.6 GW by 2040) and its share of overall gross winter peak growth (e.g., 7% by 2040), as well as the residual attributable to retrofits, for each forecast year and over the period. Because the AEBA increment is tied to construction and intensity assumptions, its absolute value is constant across scenarios; only its share varies by scenario.

Units and rounding: All results are expressed in MW or GW as reported. Totals and shares may not sum perfectly due to rounding.

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