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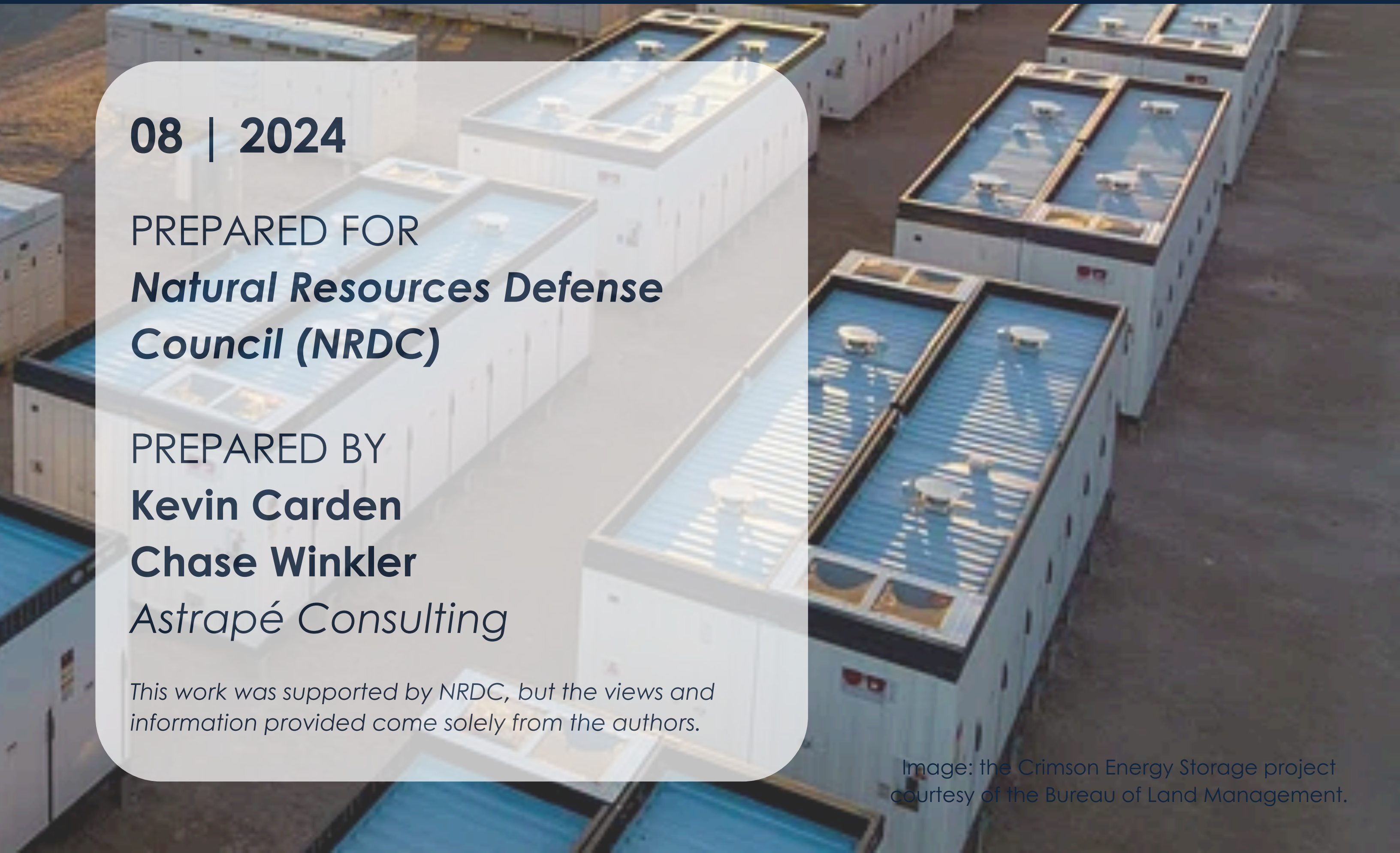
Illinois Deactivations: Maintaining Reliability with Energy Storage



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PREPARED FOR
Natural Resources Defense Council (NRDC)

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Image: the Crimson Energy Storage project courtesy of the Bureau of Land Management.

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Executive Summary

The following report has been prepared by Astrapé Consulting in response to the "Illinois Generation Retirement Study" put forth by PJM Interconnection ("PJM study").[1] Both studies examine the reliability impact of Illinois's Climate and Equitable Jobs Act (CEJA),[2] a law that requires generators to decarbonize on specific schedules based on location and emissions rates. CEJA-related generator retirements have spurred concerns around maintaining electric reliability in the face of significant capacity losses.

The PJM study concluded that CEJA-related retirements "create the need to import a substantial amount of remote replacement power to serve load", resulting in the appraisal of $700M in regional transmission upgrades by 2030.[3] The PJM study did not evaluate the impact of adequate replacement generation and new energy storage resources within the Illinois footprint, despite recognizing that "new generation located at the same points where units are retiring, or in similarly favorable locations, could decrease the transmission cost estimates outlined in our findings."[4]

This report shows that 3 GW of battery storage and expected replacement resources, all sited within Illinois, can resolve a resource adequacy shortfall driven by retiring generation without the need for transmission upgrades.

This analysis extends the scope of the PJM study by utilizing SERVM (Strategic Energy and Risk Valuation Model) to perform a resource adequacy assessment on the benefits of adding Battery Energy Storage System (BESS) power stations within the Illinois zone[5] to offset CEJA-related capacity losses. To determine whether reusing the interconnection capabilities of retiring fossil plants is a viable strategy, the analysis specifically limited new storage additions to not exceed the quantity of retiring capacity. The analysis found that the addition of 2,972 megawatts (MW) of 4-hour battery storage and expected resource additions from the MISO and PJM interconnection queues, all sited within the Illinois zone, are sufficient to maintain reliability at the industry standard (0.1 LOLE) for the year 2030. Further, the storage capacity required to meet the reliability standard is considerably less than the retiring capacity,

[1] PJM Interconnection, "Illinois Generation Retirement Study," August 3, 2022.
https://www.pjm.com/-/media/library/reports-notices/special-reports/2022/2022-pjm-illinois-generation-retirement-study.ashx
[2] Public Act 102-0662, "The Climate and Equitable Jobs Act (CEJA)," September 15, 2021.
https://www.ilga.gov/legislation/publicacts/102/102-0662.htm
[3] PJM Interconnection, "Illinois Generation Retirement Study," 4.
[4] PJM Interconnection, "Illinois Generation Retirement Study," 3.
[5] The Illinois zone comprises both MISO Zone 4 and PJM's ComEd territory.

indicating that the on-site replacement of approximately one-quarter of the retiring resources could host the 2,972 MW of storage. Figure 1 (below) provides an overview of the results and scenarios modeled.

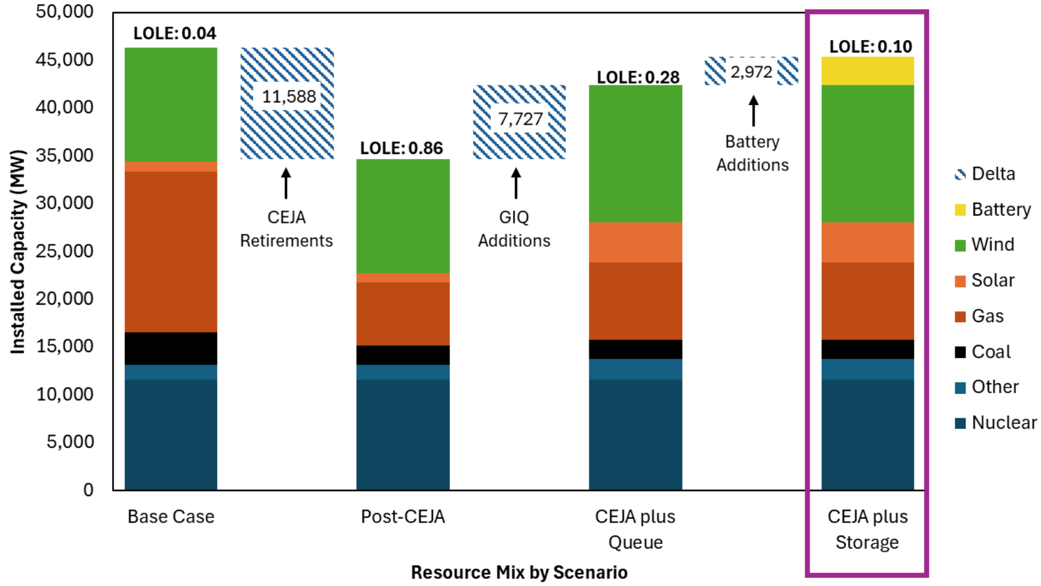


Figure 1: Illinois Resource Mix by Scenario

The PJM study projected transmission upgrades primarily driven by the need to import substantial quantities of remote power to serve Illinois's load. While this analysis does not include any power flow modeling, it does demonstrate from a resource adequacy perspective that 2,972 MW of new storage capacity in the Illinois zone mitigates the need for remote imports, even on the most extreme weather days and on days when the system faced highest peak demand. The results demonstrate that battery storage capacity reduces Illinois's reliance on imported energy, keeping the state within transmission import limits and thus avoiding the transmission upgrades identified in PJM's study.

To obtain a more accurate estimate of CEJA's reliability impacts and associated transmission upgrade costs, the PJM study should be updated to evaluate reasonable capacity additions within the Illinois zone, including sufficient generator interconnection queue (GIQ) resources and energy storage. While this analysis did not quantify the costs associated with the deployment of 3 GW of BESS and the avoided costs of transmission needed to import power, it could be an area of future development.

I. Background and Context

The Illinois Climate and Equitable Jobs Act (CEJA) was passed in 2021, requiring that Illinois's power sector decarbonize by specific dates, with the ultimate goal of 100% carbon-free power by 2045. [6] CEJA requires that fossil fuel generating units decarbonize and reduce all criteria air pollutants based on their current size, location, and emissions rates on a designated timeline. By 2030, the entirety of Illinois's existing privately-owned coal fleet is required to completely reduce emissions. Similarly, certain natural gas generators are required to completely reduce emissions if they meet certain emissions criteria and are located near environmental justice communities.[7] Based on these guidelines, an estimated 11,588 MW of fossil fuel capacity within the Illinois footprint will retire by 2030.

Following passage of CEJA, the PJM study was undertaken to examine the system-wide implications of generator retirements mandated by the law. The PJM study concluded that the CEJA-related retirements "create the need to import a substantial amount of remote replacement power to serve load" and accordingly modeled replacement generation outside Illinois that ultimately resulted in "significant east-to-west power-flow increases."[8] These observed changes in power flows driven by increased imports resulted in thermal and voltage-based violations, which PJM chose to mitigate by appraising costly transmission upgrades.

While PJM's study recognized that "new generation located at the same points where units are retiring, or in similarly favorable locations, could decrease the transmission cost estimates outlined in our findings,"[9] they did not undertake the evaluation of these as an alternative solution. As a result, the PJM study concluded that the region would need to pay for $700 million in transmission upgrades by 2030 to maintain reliability.[10] This analysis extends the scope of the PJM study to adequately evaluate the resource adequacy benefits of expected new resource additions and battery storage in the Illinois zone on reliability and as a tool to mitigate Illinois's projected reliance on imports.

[6] Public Act 102-0662, "The Climate and Equitable Jobs Act (CEJA)."
[7] Specifically, a natural gas generator must retire by 2030 if it is located a) in or within 3 miles of an environmental justice (EJ) community designated as of January 1, 2021, or an equity investment eligible community (EIEC), and b) currently has a NOx emissions rate greater than 0.12 lbs/MWh or SO2 emission rate greater than 0.006 lb/MWh. Illinois Environmental Protection Agency, "Electric Generating Units and Large Greenhouse Gas-Emitting Units." Accessed June 18, 2024. https://epa.illinois.gov/topics/ceja/electric-generating-units.html
[8] PJM Interconnection, "Illinois Generation Retirement Study," 4.
[9] PJM Interconnection, "Illinois Generation Retirement Study," 3.
[10] PJM Interconnection, "Illinois Generation Retirement Study," 3.

II. Comparison to PJM Study

This analysis employed a methodology that was designed to respond to the PJM study from a resource adequacy perspective. While the PJM study employed both power flow and reliability models, this analysis focused solely on reliability, and thus did not model the transmission system beyond import constraints from neighboring regions. The assumptions of this analysis mirror those of the PJM study, including "post-CEJA" scenario estimates of CEJA-related capacity losses totaling 11,588 MW in 2030, compared to PJM's estimate of 11,594 MW.[11] Table 1 compares both the PJM study and Astrapé analysis.

Table 1: Comparison to PJM Study

	Astrapé Analysis	PJM Study Analysis[12]
CEJA Retirements (2030)	11,588 MW	11,594 MW
GIQ Additions in Illinois Zone	7,727 MW	1,723 MW[12]
GIQ Additions in Illinois Zone - PJM Territory	5,605 MW	1,723 MW[12]
Storage Additions in Illinois Zone	2,972 MW	0 MW
Type of Analysis	Resource Adequacy	Transmission Adequacy
Costs Modeled	No	Yes, transmission costs

[11] PJM Interconnection, "Illinois Generation Retirement Study," 5.

[12] All GIQ addition values for the PJM Study Analysis were derived from p.11 of David M. Egan's August 9, 2022 presentation to the PJM Planning Committee regarding the results of PJM Interconnection's "Illinois Generation Retirement Study." https://www.pjm.com/-/media/committees-groups/committees/pc/2022/20220809/item-08a---2022-pjm-illinois-generation-retirement-study-presentation.ashx

III. Scenarios

SERVM utilized the Loss of Load Expectation (LOLE) as the primary reliability metric, classifying industry-standard reliability as 0.1 LOLE, or one loss of load event every 10 years. The analysis simulated Illinois's resource adequacy position for each scenario across the following 4 scenarios for system conditions in 2030, indicating whether the region had capacity in excess of 0.1 LOLE. Each scenario builds on the assumptions of the previous scenario.

- **Base Case:** Existing installed capacity on Illinois system minus announced generation retirements.[13]
- **Post-CEJA**: Base Case minus expected generation retirements required in CEJA by 2030, totaling 11,588 MW.
- **CEJA plus Queue**: Post-CEJA Case plus expected weighted additions from the Generator Interconnection Queue (GIQ), totaling 7,727 MW.
- **CEJA plus Storage**: CEJA plus Queue Case plus additional storage as required to meet reliability standards.

This analysis considered several scenarios for the aggregate Illinois zone. The projected resource mix, shown in Table 2, was modified by considering announced retirements[13] to create the Base Case, decreasing Illinois's installed capacity by 7,323 MW. The Base Case served as the starting point for the reliability analysis. To create the Post-CEJA Case, the expected CEJA-driven generator retirements[14] were subtracted from the Base Case, totaling 11,588 MWs of installed capacity. The Post-CEJA Case's expected retirement capacity value aligned closely with the CEJA-driven retirements estimated by PJM, which totaled 11,594 MWs.[15]

The CEJA plus Queue Case was created by modifying the Post-CEJA scenario by considering Generator Interconnection Queue (GIQ) Resources in Illinois within both MISO and PJM territory.[16] GIQ Resource additions were included on a probability-weighted basis, which was performed in a manner

[13] The Base Case includes all announced retirements as of March 2024.
[14] CEJA-driven retirements in 2030 include natural gas generating stations with pollution rates >0.12 lbs/MWh of NOx or >0.006 lbs/MWh of SO_2 and located in or within 3 miles of an environmental justice (EJ) community designated as of January 1, 2021, or an equity investment eligible community (EIEC). Public Act 102-0662, "The Climate and Equitable Jobs Act (CEJA)."
[15] PJM Interconnection, "Illinois Generator Retirement Study," 5.
[16] The PJM Generator Interconnection Queue is accessible at: https://www.pjm.com/planning/service-requests/serial-service-request-status and the MISO Interactive Generator Interconnection Queue is accessible at https://www.misoenergy.org/planning/resource-utilization/GI_Queue/gi-interactive-queue/

similar to the PJM retirement study,[17] where generators in the queue with a signed Interconnection Service Agreement (ISA) received 100% weighting and generators with a facilities studies agreement received 57% weighting. The estimated capacity of GIQ Resources based on the weighted analysis in Illinois totaled 7,727 MWs by 2030. The final expected installed capacity values are displayed in Table 2 below for the Illinois region.

Table 2: Illinois Zone Generator Interconnection Queue (GIQ) Resources Expected by 2030

Resource Class	IL-MISO[18] (MW)	IL-PJM[19] (MW)	Total (MW)
Battery	0	627	627
Gas	185	1,245	1,430
Solar	1,228	1,965	3,193
Wind	709	1,768	2,477

The PJM study only detailed the portion of the replacement capacity that would be sited in Illinois's PJM zone (1,723 MW), but this analysis showed that 5,605 MW of GIQ resources are expected in Illinois's PJM zone by 2030. While this analysis employed the exact same methodology as the PJM study,[20] the discrepancy in expected GIQ additions within Illinois's PJM zone is due to updated GIQ data. The PJM study utilized GIQ data from January 2022 and Astrapé's analysis uses updated data from 2024.

Table 3: Comparison of IL-PJM[19] Generator Replacement Resources Expected by 2030

Resource Class	Astrapé Assessment (MW)	PJM Assessment (MW)
Other	1,872	984
Solar	1,965	431
Wind	1,768	308

The CEJA plus Storage Case was created by modifying the CEJA plus Queue scenario by considering the addition of storage. SERVM was utilized to determine the total capacity of storage required to bring the system to 0.1 LOLE, which totaled 2,972 MWs of 4-hour batteries.

[17] PJM Interconnection, "Illinois Generator Retirement Study," 5.
[18] IL-MISO refers to resources interconnecting in MISO Zone 4.
[19] IL-PJM refers to resources interconnecting in PJM's ComEd Territory.
[20] PJM Interconnection, "Illinois Generator Retirement Study," 5.

IV. Results

Figure 2 and Table 4 display the result of SERVM's simulation of all four scenarios (Base Case, Post-CEJA Case, CEJA plus Queue Case and CEJA plus Storage Case). In the Base Case, the Illinois zone has a surplus position. In the Post-CEJA Case, the loss of capacity results in the Illinois zone exhibiting a short position. In the CEJA plus Queue Case, the short position is partially mitigated by the addition of the expected GIQ capacity. However, in the CEJA plus Queue Case, a shortfall of 2,213 MW of perfect capacity remains. In the CEJA plus Storage Case, SERVM determined the total capacity of 4-hour batteries required to bring the system to the planning standard of 0.1 LOLE, totaling 2,972 MW of 4-hour batteries. A sensitivity was performed to determine the total capacity of 8-hour batteries required to bring the system to 0.1 LOLE. The exercise yielded a required capacity of 2,243 MW of 8-hour batteries, which indicates the slightly higher capacity value of longer duration storage.

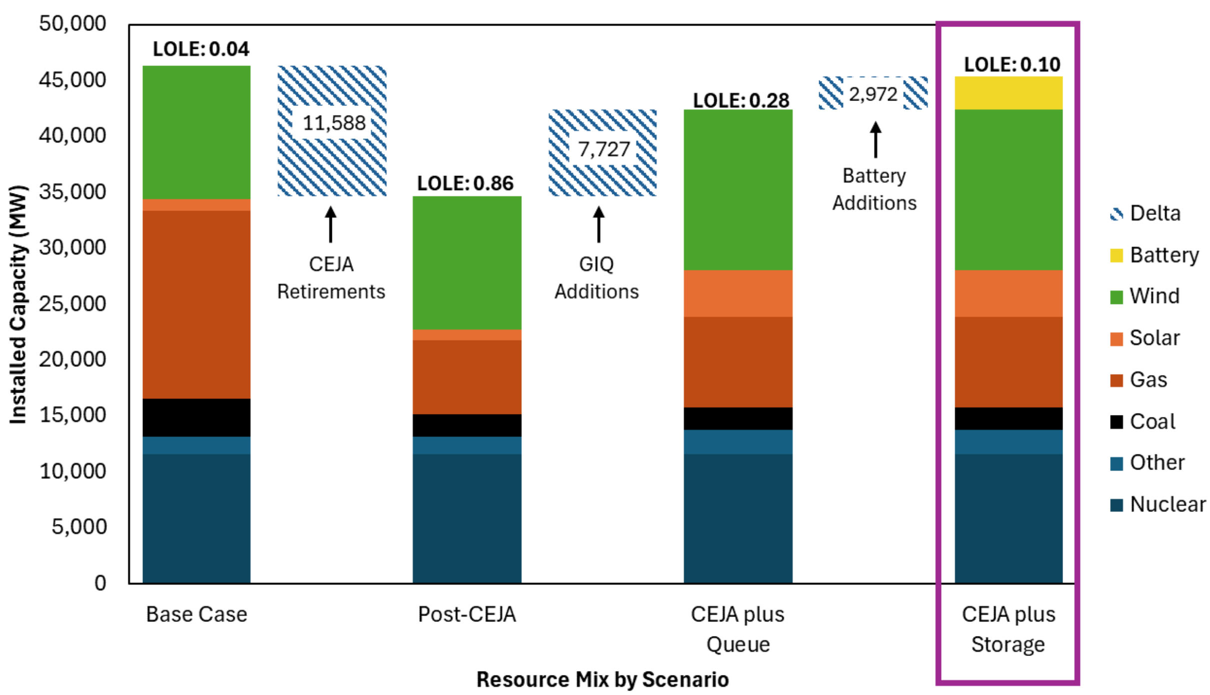


Figure 2: Illinois Resource Mix by Scenario

Table 4: Illinois LOLE and Perfect Capacity Requirements, by Simulated Scenario

Scenario	LOLE	Perfect MW Relative to 0.1 LOLE Excess/(Shortfall)
Base Case	0.04	4,971
Post-CEJA	0.86	(5,065)
CEJA plus Queue	0.28	(2,213)
CEJA plus Storage	0.1	0

Lastly, the impact of energy storage was simulated on the need for on-peak imports from outside the Illinois zone. For each weather year net peak day, the net imports into the Illinois zone were assessed and compared against the import limit. A distribution of imports is observed as a function of resource availability and load within Illinois due to weather. SERVM's simulation revealed that a portfolio of 2,972 MW of 4-hour storage avoids approximately 2,000 MW of these imports on net peak, as well as on the highest weather year days. This avoided capacity successfully brings imports below the aggregate transmission import limit.

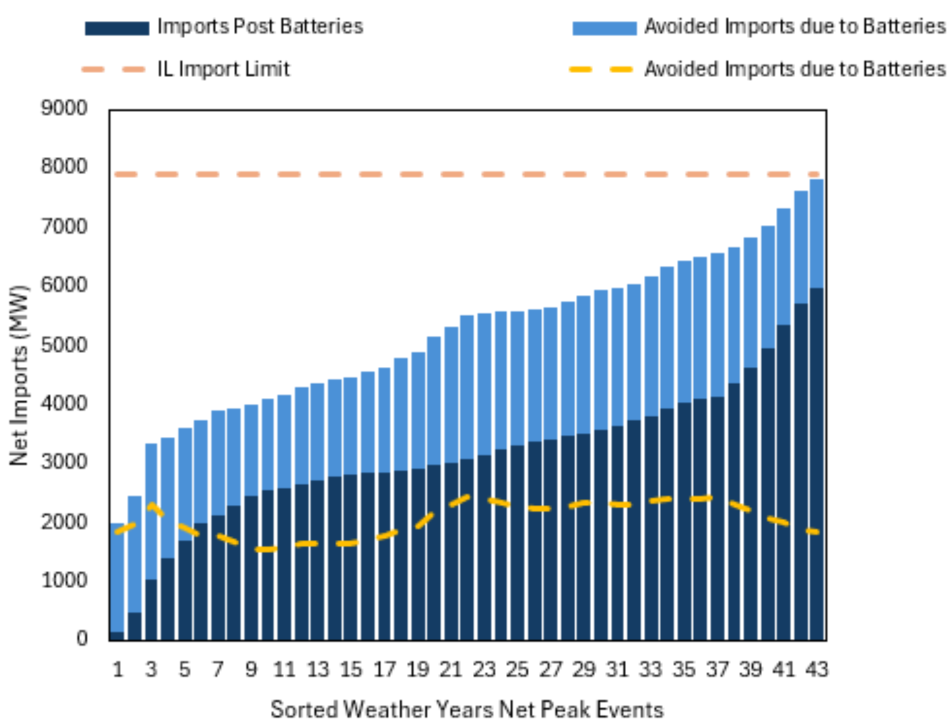


Figure 3: Storage Impact on Imports for Net Peak Days

V. Conclusion

CEJA-related generator retirements have spurred concerns around the ability of the Illinois system to maintain reliability in the face of significant capacity losses. This analysis found that the addition of 2,972 megawatts (MW) of 4-hour battery storage and expected resource additions from the MISO and PJM interconnection queues, all sited within the Illinois zone, are sufficient to maintain reliability at the industry standard (0.1 LOLE) for the year 2030. The results also show that the addition of energy storage in the Illinois zone reduces the state's reliance on imports, obviating the transmission upgrades identified by PJM.

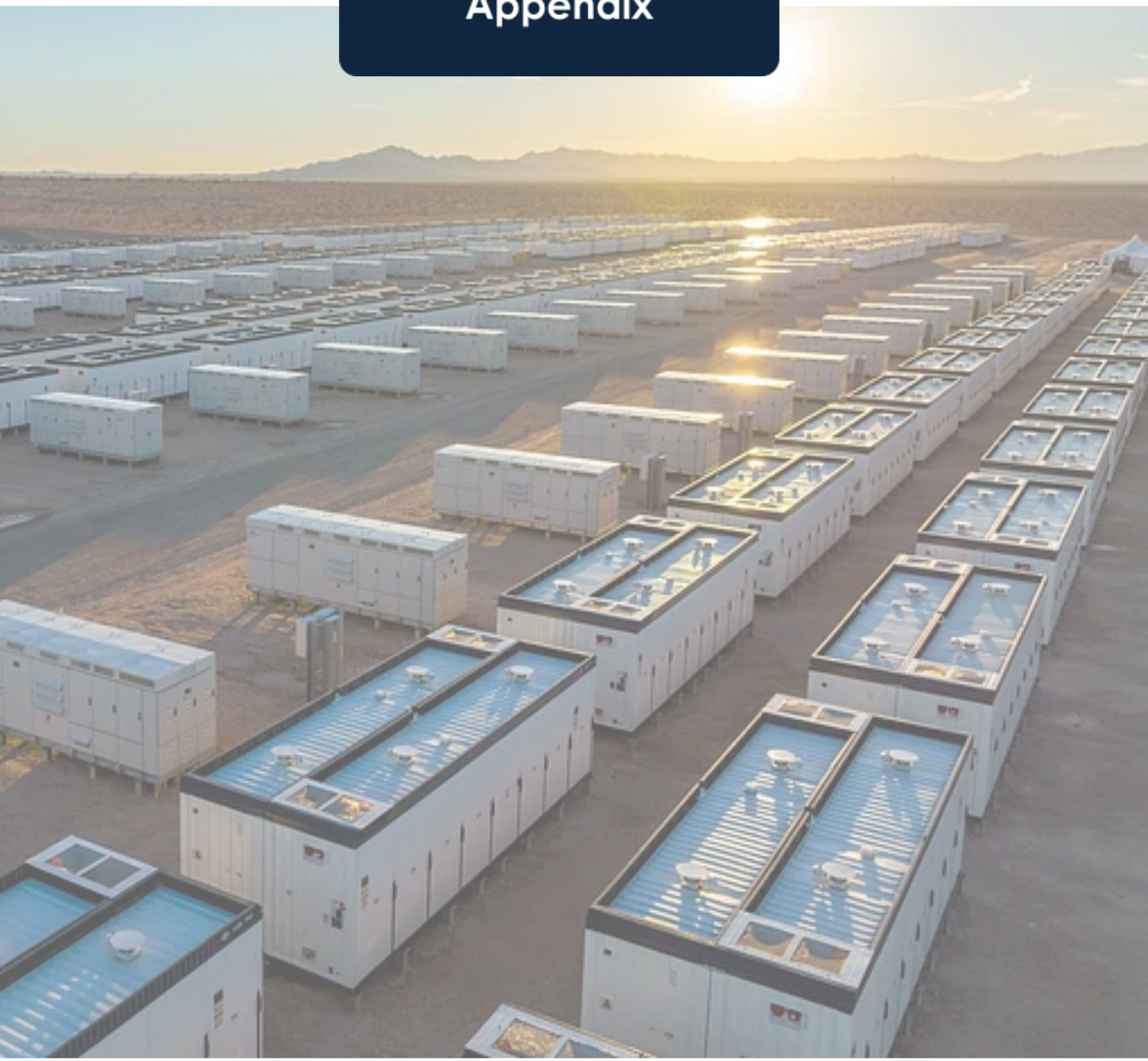
Overall, this analysis proves that Illinois can meet its clean energy goals without sacrificing reliability, as long as sufficient clean replacement generation and energy storage is built within the state's footprint in a timely manner. Energy storage can effectively substitute thermal capacity and help maintain reliability, whether it is placed at the same interconnection site as retiring resources or at other advantageous interconnection sites. In Illinois, the interconnection capability that will be freed up by the capacity retiring by 2030 exceeds what is required to support the necessary storage capacity additions.

The political and economic feasibility of replacing retiring resources with battery storage depend on a variety of factors, but a number of states have successfully done so, including California, Hawai'i, and Massachusetts. Plus Power's Kapolei battery system in Hawai'i—a 185 MW / 565 MWh battery storage facility[21]—is a primary example of utilizing energy storage to replace fossil fuel generation, a solution that allowed for the retirement of Hawai'i's last coal plant in 2022. To implement similar state-driven solutions in Illinois, the state must assess the system's need for storage resources and commit to strong and consumer-friendly storage policy.

PJM has a pivotal role to play in ensuring that replacement solutions are available to support progress towards state clean energy policy goals. Going forward, PJM should examine the value of capacity additions and alternative technologies like energy storage, and quantify the costs associated with the deployment of 3 GW of BESS and the avoided costs of transmission needed to import power. Should Illinois choose to adopt a storage policy, PJM must enable the efficient and orderly replacement of retiring generation with storage. A reliable energy transition warrants careful study and coordinated action from governments and grid operators to ensure BESS and new clean resources can provide cost-effective reliability value.

[21]Please find more information on the project at Plus Power's website: https://www.kapoleienergystorage.com

Appendix



Appendix: Model Inputs and Setup

The following sections include a discussion on the major modeling inputs associated with this resource adequacy analysis. Reliability events are characterized as being high impact and low probability, meaning that numerous scenarios must be considered to accurately project them. As detailed below, in this analysis the SERVM model utilized 43 years of historical weather and load shapes, 5 points of economic load growth forecast error, and 5 iterations of unit outage draws for each scenario to represent the full distribution of realistic system conditions. The number of yearly simulation cases equaled 1,075 total iterations for each scenario studied, a product of 43 weather years * 5 load forecast errors * 5 unit outage draws. Weather years and solar profiles were each given equal probability while the load forecast error multipliers were given their associated probabilities as reported in the input section of this report. Three regions were modeled in this analysis, MISO North, PJM West, and Illinois (defined as a combination of PJM's ComEd zone and MISO LRZ4).

Weather Year Data

The SERVM model represents weather uncertainty by simulating multiple weather years for every given study year. In this analysis, 43 weather years (1980-2022) were applied to the 2030 study year. For each weather year there are unique 8,760 hourly profiles for load shape, solar output, and wind output. SERVM represents unique load shapes for each of the three regions being simulated as well as unique solar and wind profiles for different resource locations. SERVM's stochastic simulation framework ensures that renewable unit generation is correlated with load. For the 8,760 hours in a given simulation, the wind and solar profiles for a specific weather year will be used to create renewable output for the wind and solar generators. SERVM takes this generation into account and then dispatches the rest of the units economically. Since both the renewable profiles and the load profiles are created from historical data, the correlation between demand and renewable generation is captured by including 43 weather years in the simulation. The development of the solar, wind, and load 8,760-hour profiles is detailed in the following sections.

Load Forecasts and Load Shapes

Table 5 displays the modeled peak and energy forecast for 2030. Forecasts were assembled from public sources available on the MISO and PJM websites.

Table 5: Load Forecast Assumptions

Region	Peak (MW)	Energy (GWh)
Illinois	29,869	154,122
PJM West	55,317	299,756
MISO North	80,451	452,050

To model the effects of weather uncertainty on these load forecasts, 43 historical weather years (1980 - 2022) were developed to reflect the impact of weather on retail load. Based on historical weather and load, a neural network program was used to develop relationships between weather observations and load.

Figure 4 below illustrates the results of the weather load modeling by displaying the peak load variance for summer for the aggregate Illinois region. Illinois was modeled as the combined MISO LRZ 4 and PJM COMED zones. The y-axis represents the percentage deviation from the 50/50 load forecast. For example, a simulation using the 1980 load shape would result in a summer peak load approximately 5% above normal. Thus, the bars represent the variance in projected peak loads for 2030 based on weather experienced during the historic weather years. Neighboring regions were modeled in a similar manner.

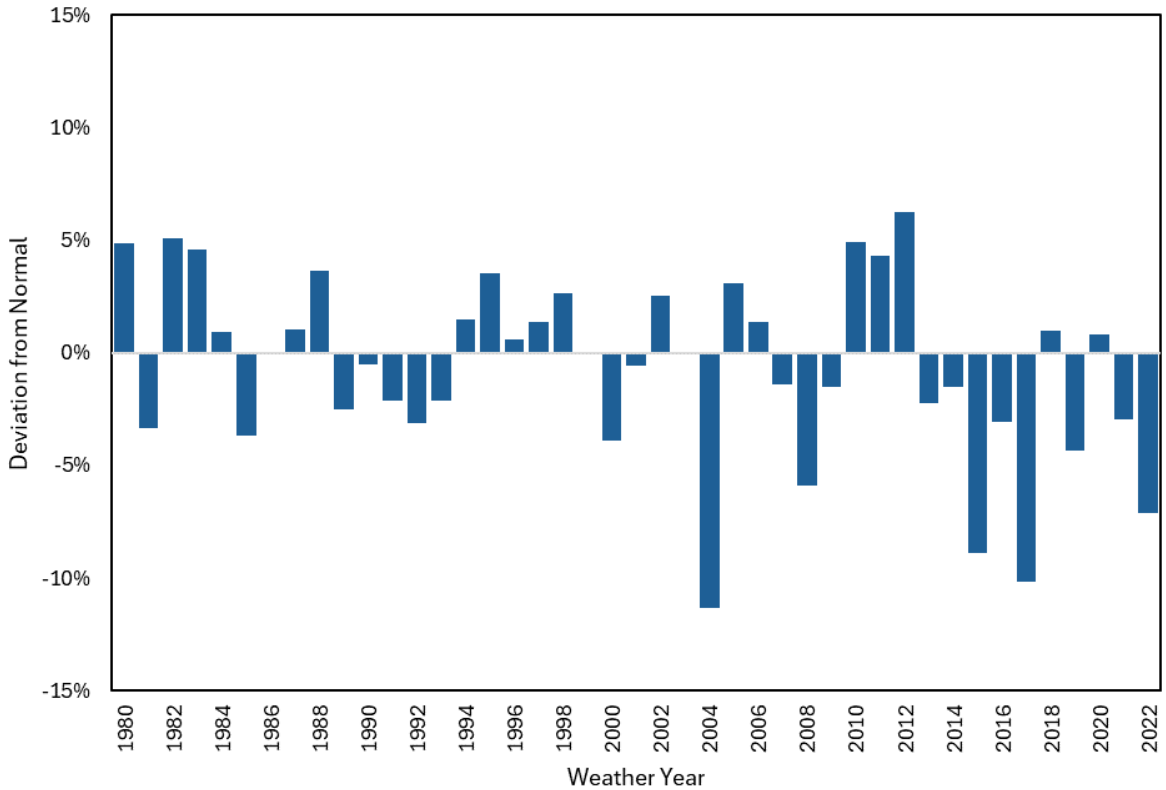


Figure 4: Summer Peak Weather Variability

Economic load forecast error multipliers were included to isolate the economic uncertainty that PJM and MISO may have in their long-term load forecasts. To estimate economic load forecast error, the difference between Congressional Budget Office (CBO) GDP forecasts and historical data that coincided with the forecasts was fit to a normal distribution. Because electric load grows at a slower rate than GDP, a multiplier was applied to the raw CBO forecast error distribution. The results of this approach are shown in Table 6 below.

Table 6: Economic Load Forecast Error

Load Forecast Error Multipliers	Probability (%)
0.96	11%
0.98	23%
1.00	32%
1.02	23%
1.04	11%

As an illustration, 11% of the time, it is expected that load will be under-forecasted by 4%. The SERVM model utilized each of the 42 weather years and applied each of these 5 load forecast error points to create 210 different load scenarios. As mentioned previously, each weather year was given an equal probability of occurrence.

Solar Shape Modeling

Historical solar data[22] was downloaded from the National Renewable Energy Laboratory (NREL) National Solar Radiation Database (NSRDB) Data Viewer, including the latitude and longitude of each location shown in Figure 3 for all available years (1998 – 2022). The data obtained from the NSRDB Data Viewer was input into NREL's System Advisory Model (SAM)[23] for each year and location to generate the hourly solar profiles based on the solar weather data for fixed and tracking solar PV plants. Inputs in SAM included the DC to AC ratio of the inverter module and the tilt and azimuth angle of the PV array. Data was normalized by dividing each point by the input array size. Solar Profiles for 1980-1997 were constructed from the 1998-2022 data by developing correlations between daily load shapes and solar profiles. This process was repeated for each of the locations, shown below in Figure 5.

[22] The NREL NSRDB Data Viewer provides historical solar data that includes latitude and longitude of various solar profile locations, temperature, cloud cover, humidity, dew point, and global solar irradiance data.
[23] "SAM is a free desktop application for techno-economic analysis of energy technologies. It is used by project managers and engineers, policy analysts, technology developers, and researchers to investigate questions about the technical, economic, and financial feasibility of renewable energy projects." For more information see https://sam.nrel.gov/

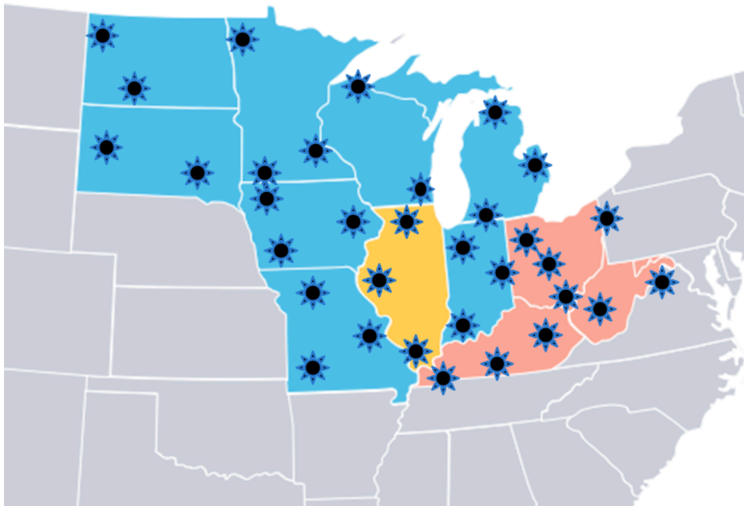


Figure 5: Solar Profile Locations

Wind Shape Modeling

Wind profiles were produced using actual historical data from 2019-2022 for PJM and 2014-2021 for MISO. To construct wind shapes back to 1980, random days were selected from the dataset based on the aggregate ISO retail load in a manner similar to the solar shape modeling described previously. Expected summer production profiles are shown for the aggregate wind portfolio in Figure 6 along with their 2nd and 3rd quartile production profiles.

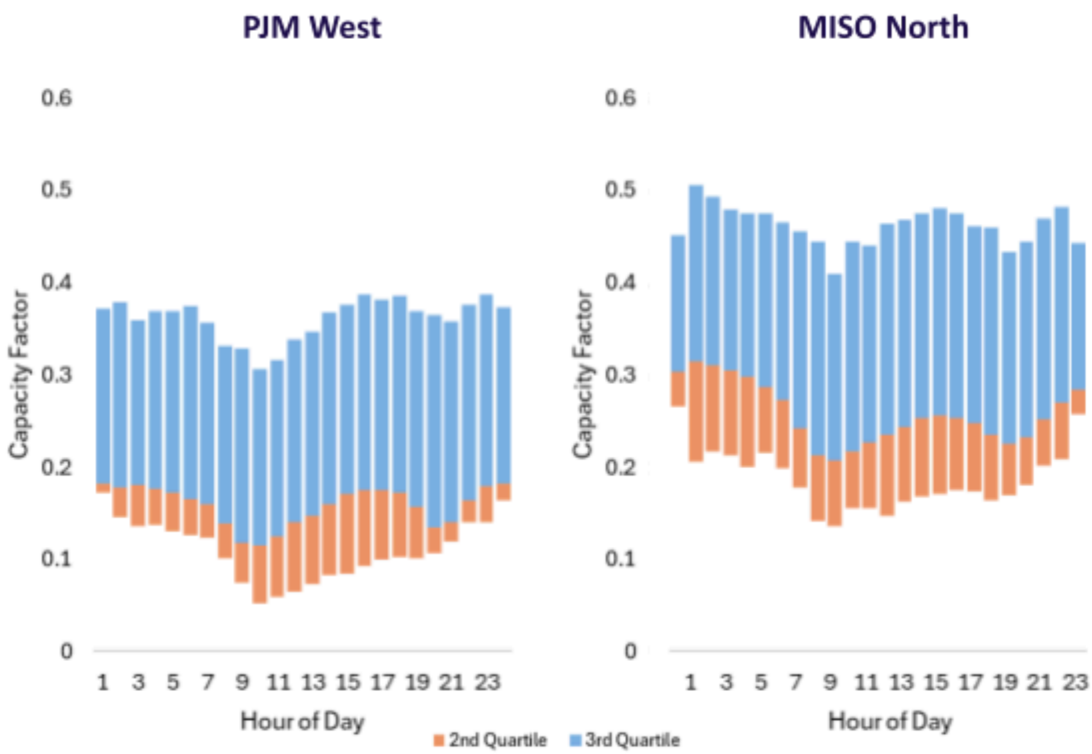


Figure 6: Summer Wind Expected Output and Variability

Conventional Thermal Resources

Conventional thermal resources are economically committed and dispatched to load on an hourly basis respecting all unit constraints including startup times, ramp rates, minimum up times, minimum down times, and shutdown times. Equivalent Forced Outage Rates are based on historical Generator Availability Data System (GADS)[24] data. Unlike typical production cost models, SERVM does not use an Equivalent Forced Outage Rate (EFOR) for each unit as an input. Instead, historical data events derived from GADS are used to create an outage probability distribution for each unit and SERVM randomly draws from this distribution for each unit to simulate outages. Outage distributions are constructed using the following variables:

[24] "NERC's GADS maintains operating information on conventional generating units, wind plants, and solar plants. Through GADS, NERC collects information about the performance of electric generating equipment and supports equipment availability analyses. GADS reporting is mandatory for NERC-registered entities with conventional generating units that are 20 MW or more, wind plants with a total installed capacity of 75 MW or more and a commercial operation date of January 1, 2005, or later." NERC, "Generating Availability Data Systems," https://www.nerc.com/pa/RAPA/gads/Pages/GeneratingAvailabilityDataSystem-(GADS).aspx

Full Outage Modeling

- Time-to-Repair Hours
- Time-to-Fail Hours
- Start Probability

Partial Outage Modeling

- Partial Outage Time-to-Repair Hours
- Partial Outage Derate Percentage
- Partial Outage Time-to-Fail Hours

Maintenance Outages

- Maintenance Outage Rate

The Maintenance Outage Rate describes the fraction of time in a month that the unit will be on maintenance outage. SERVM uses this percentage and schedules the maintenance outages during off-peak periods. Planned maintenance events are modeled separately and dates are entered in the model representing a typical year.

Storage Modeling

As part of the unit commitment process, SERVM optimizes the utilization of storage resources to minimize system production costs while meeting all load and ancillary service obligations. As part of this optimization, storage resources can serve both energy and ancillary services.

In this analysis, storage was modeled with an 85% round trip efficiency and a 5% forced outage rate. Storage temporal constraints were also respected to accurately represent storage charging requirements and State of Charge (SOC) availability.

Study Topology and Generation Mix

The Illinois aggregate zone and neighbors one tier away were modeled. An aggregate import limit of 7,884 MW from either neighboring entity (MISO North and PJM West) was modeled as shown in Figure 7 below. The aggregate import limit is derived from General Electric's report titled "Illinois' Policy

Proposals on Resource Adequacy" which was a component of the Illinois Power Agency's March 2024 Policy Study.[25]

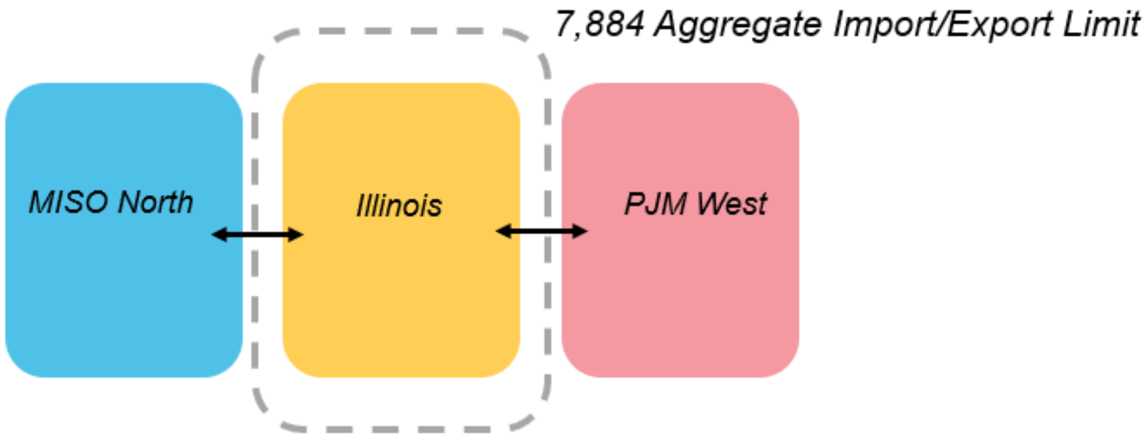


Figure 7: Study Topology

Neighboring entities were modeled with the same level of detail as the Illinois zone as described above (e.g. generators with EFOR, solar and wind profiles, weather profiles, etc.). Each zone was committed and dispatched subject to their respective loads. Each entity's generation mix (installed capacity) for 2030 is displayed in Table 7 below, which is used as the starting point for the study's Base Case.

This analysis was intended to be complementary to the PJM study that was performed using summer conditions and thus also focused on summer peak conditions. While PJM has recognized increased winter reliability risk, much of that risk is driven by heavy reliance on gas resources which Illinois would not be as affected by given the CEJA-related gas retirements. Further analysis would be necessary to understand winter reliability implications on both transmission and generation adequacy.

[25] Illinois Power Agency and Levitan & Associates, Inc., "Evaluation of Illinois' Policy Proposals on Resource Adequacy," March 1, 2024. https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/20250301-appendix-c-ge-report-1mar2024-clean.pdf

Table 7: 2030 Resource Mix (Installed Capacity), Illinois and Neighbors

Category	Illinois (MW)	PJM West (MW)	MISO North (MW)
Nuclear	11,582	6,106	5,238
CC	4,589	25,227	16,656
Coal	10,763	16,766	28,390
CT / Peaker	10,872	12,334	28,387
Solar	970.4	7,902	17,798
Storage	547.1	983	200
Wind	9,138	12,992	40,783
PSH	440	228	2,144
DR	614	10,779	8,806