Vistra's Comments to the Illinois Power Agency Second Data Request Regarding Energy Policy Study as authorized in HB 3445

Background:

Vistra respectfully offers the following comments and answers in response to the Illinois Power Agency's second data request regarding the energy policy study authorized by House Bill 3445. Our company's statements and perspective primarily focus on developing energy storage systems owned by private, large-scale energy storage providers assisted with energy storage credits, as proposed in Senate Bill SB 1587. We appreciate the opportunity to provide comments and engage in the policy discussion regarding energy storage policies in Illinois.

Vistra's Comments Regarding Energy Storage and Procurement Processes as Proposed in SB 1587

Vistra believes that dispatchable energy storage will be essential to the transition to a clean energy economy in Illinois and other jurisdictions. As a recognized leader in the energy space with an extensive and growing energy storage portfolio, Vistra is pleased to provide comments, information, and expertise about the development and integration of energy storage into the electricity grid and the benefits energy storage systems provide.[1]

The potential for growth of utility-scale energy storage systems is enormous. A recent Wood Mackenize report[2] projects that by 2030, global energy storage installations will be close to the 1TWh mark and that lithium-ion battery manufacturing capacity (needed to support large-scale development of battery storage systems) will double in the next two years. The U.S. and China are expected to possess 73 percent of the world's total energy storage capacity in 2030, with 40 percent of the global capacity in the U.S. In 2030, the U.S. is anticipated to surpass 300 GWh of installed capacity and have 53 GWh of installations that year. An increasing global market for energy storage technologies and government incentives should help encourage increased research and development activities, reduce costs[3] , and spur continued implementation.

While not the only public policy benefit, the additional development and implementation of utility-scale energy storage systems will support the continued growth, deployment, and reliance on utility-scale, non-dispatchable renewable resource generation. Vistra believes that, in the long run, a competitive, market-driven process should guide the development and connection of energy storage systems to the grid. However, incentives for storage development may be necessary and appropriate during the long-term transition to a clean energy electric power sector.

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[1] The "About Vistra" section at the end of this document provides more detailed information about Vistra's activities in the clean energy and energy storage space.

[2] "Global Energy Storage Outlook H2 2021", Woods Mackenzie, 2021: https://www.woodmac.com/reports/power-markets-global-energy-storage-outlook-h2-2021-532298/ (last accessed January 11, 2022 – requires purchase)

[3] Pacific Northwest National Laboratory, "Energy Storage Cost and Performance Database": https://www.pnnl.gov/ESGC-cost-performance (last accessed January 11, 2022)

Vistra encourages leaders to consider the following suggestions for achieving a cost-effective and efficient transition to a clean energy economy utilizing energy storage:

- Prioritizing the deployment of energy storage systems at operating, to-be-retired, or retired powerplant sites with existing transmission or other associated infrastructure to reduce development timeline and costs versus sites with no existing infrastructure.
- Encouraging preferences for bidders to locate energy storage systems at “brownfield” sites (broadly defined to include, for example, former fossil-fueled plant sites, not just acreage being remediated in accordance with environmental law requirements) and/or in communities that were impacted by the transition away from coal-fueled generation and are eligible for community transition grants.
- Prioritizing sites proposed by entities with existing or pending interconnection agreements to avoid protracted delays through the approval process to connect new storage systems to the grid.
- Prioritizing sites proposed by entities with replacement generation capacity and that qualify for the replacement generation interconnection study process in MISO and PJM RTOs to reduce the likelihood of delay in time to commercial operations.
- Reviewing resource adequacy and reliability factors in MISO Zone 4 and within the Illinois PJM region and prioritizing initial deployments of storage systems in the areas of greatest need or to mitigate reliability risks.
- Developing a system that provides viable market structures and signals that value both clean energy and reliability attributes.
- Ensuring that all customers, default service and alternative retail providers, have equal access to energy storage benefits.
- Create definitions of energy storage that have enough flexibility to incorporate future technologies and methods of energy storage that may not currently be envisioned or commercially available.
- Recommending property tax certainty for stand-alone energy storage sites, similar to the property tax certainty provided to stand-alone solar or combined solar and storage sites as established in state law to avoid varying tax practices across taxing jurisdictions.

Vistra Response to IPA Energy Storage Procurement Questions

A. *Senate Bill 1587 sets a procurement goal of 7,500 MW of energy storage by 2030. Is this a realistic or appropriate goal for energy storage in Illinois? How does this compare to goals and timelines for achieving those goals in other states?*

   The proposed 7,500 MW target is reasonable compared to the expected retirement queue of generation assets through 2030 and the economic, regulatory, permitting, and other challenges associated with utility-scale renewable development. The state’s procurement target should also be evaluated and potentially increased based on ongoing and pending reliability concerns, resource adequacy, environmental studies being conducted or planned by PJM, MISO, and authorized by the Energy Transition Act, jointly, for the Illinois Power Agency (IPA), Illinois Commerce Commission (ICC), and Illinois Environmental Protection Agency (IEPA). The IPA should be given the authority to adjust and increase these goals should state and regional analysis studies indicate an additional capacity need before 2030.

The following are the stated goals of other states:

- California: 1,325 MWs of 4-hour Battery Energy Storage Systems to be procured by 2020 with a commercial operation date of 2024
- Connecticut: 1,000 MW of energy storage by 2030
- Maine: 400 MW of energy storage by 2030
- Massachusetts: 1,000 MW of energy storage target by the end of 2025
- Minnesota: 3,000 MW of energy storage by the end of 2033
- New Jersey: 2,000 MW of energy storage by 2030
- New York: 3,000 MW of energy storage by 2030
- Nevada: 1,000 MW of energy storage by 2030
- Virginia: 3,100 MW of storage by 2035
- Wisconsin: No energy storage specific requirement, but since 2022, the WI PSC has approved ~1,200 MW of hybrid storage systems with an additional ~2,500 of solar/storage systems planned for retiring coal plants. Wisconsin has a goal of 100% carbon-free by 2050.

B. Is an indexed energy storage credit structure (as proposed in SB 1587, and modeled off the approach presently utilized for large-scale renewable energy projects in the Illinois Renewable Portfolio Standard) an appropriate compensation structure for energy storage? If not, what structures would more efficiently and cost-effectively compensate energy storage projects to incentivize new development? Should that structure vary based on project size?

Vistra supports the approach embodied in Senate Amendment 1 to SB 1587 as appropriate for developing large-scale energy storage systems associated with renewables, co-located with other generation, or stand-alone energy storage systems. The State of New York is considering a similar approach as S.A. 1 to SB 1587. Vistra has met with New York agencies regarding their procurement approach and views the market design as a viable path to development and may participate in future opportunities.

In Illinois, consideration should be given to breaking out the procurements by project size to account for various efficiencies and economies of scale. Vistra believes procurements could be sized for systems with less than 50 MW capacity, 50-100 MW capacity, and greater than 100 MW capacities.

C. Should procurement design differ for varying types of energy storage projects, such as differentiating between stand-alone energy storage projects, projects paired with renewable resources, specific-storage technologies, and projects located at the sites of former coal plants? If so, what kind of varying procurement structures should be considered?

Our company has long expressed concerns regarding resource adequacy and reliability concerns across the central MISO region and Zone 4. Senate Amendment 1 to SB 1587 wisely recognizes and suggests a preference or priority be assigned to projects in this market area, given the numerous concerns regarding reliability in this portion of the state.

Future storage procurements should also be consistent with existing state policies focused on attaining a "Just Transition" and supporting communities, counties, and regions of the state that were negatively impacted by the retirement of coal-fueled generation. Encouraging the development of storage systems in these regions would help create a new property tax base and create economic stimulus from the construction of the facilities.

Reusing sites that have long been zoned and reserved for the industrial use of generating and transmitting electricity is a wise public policy and preserves acreage across Illinois for other uses, such as agriculture. Reusing these legacy industrial sites meets the traditional public policy goal of repurposing a "brownfield" or "industrial property." However, state policy must recognize that not every acre of land at the site has been or is in active remediation in accordance with environmental laws or regulations. Suppose the "brownfield" definition remains as limited as it is in the current statute and as applied to brownfield solar procurements. In that case, there is likely no value in a brownfield storage procurement targeting former coal plant sites. Rather than looking holistically at the coal plant site in its current form, the current definition requires the entire developable acreage for storage (or solar) to be limited to acreage under active remediation. This limits the scope, size, project layout, and goal of using every developable acre of the industrial site to its highest and best use.

Preferences or prioritizing storage development at retired or to-be-retired coal power plants could take the form of bid adjustments similar to what is already in place for utility-scale indexed REC procurements and has a track record of attracting interest.

State policies should also look beyond the looming retirements of coal-fueled generation and account for the retirement of natural gas generation. Our company built and operates Texas' largest energy storage system on the grounds of a natural gas power plant. Adding energy storage at the facility provides another instantly dispatchable resource to the plant's mix to address reliability and market needs for electricity.

Encouraging the development of energy storage systems at highly efficient combined cycle units in Illinois would give the plants additional flexibility to operate and meet reliability and resource adequacy needs during the transition to carbon-free sources. This policy could assist the State with lowering emissions while meeting reliability and resource adequacy needs. (Also see commentary identified as "Benefits of Battery Energy Storage Systems.")

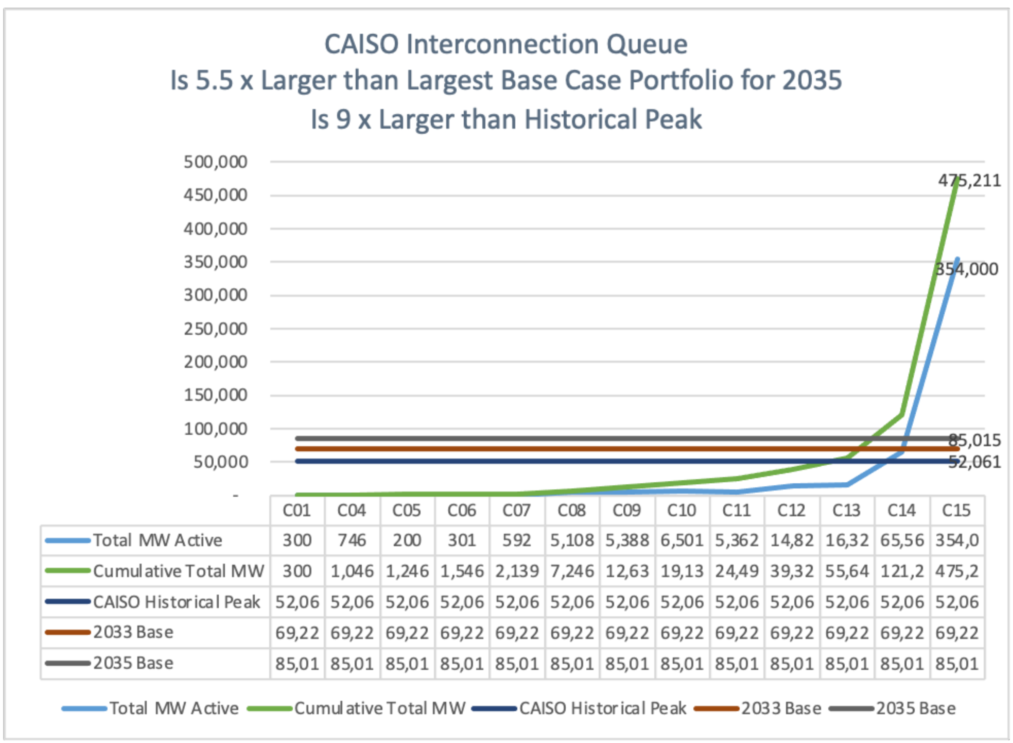
D. *What scale of procurement for long-duration energy storage is needed for Illinois? Is the proposal in SB 1587 sufficient? What special considerations for long-duration projects should the IPA consider when conducting its analysis?*

It may be beneficial for the ICC to partner with MISO and/or PJM to conduct a study that includes long-duration storage, capacity expansion, and production cost modeling to identify the best approach for Illinois to meet the industry-wide 1-day-in-10 year resource adequacy standard in future years. It will help determine if the long-duration energy storage proposal in SB 1587 is sufficient.

For example, in California, the California Public Utility Commission (CPUC) now establishes resource adequacy targets based on future system needs and reliability requirements and requires including a generic resource that represents long-duration energy storage in this analysis. CPUC uses the Strategic Energy Risk Valuation Model (SERVM) tool to provide a more detailed analysis of system reliability once a future portfolio has been established; SERVM can help identify whether the future fleet, including long-duration storage, meets the required reliability standard. As background, SERVM is a tool that can provide an improved understanding of resource adequacy risks, determining if a reliability event could happen and the likelihood, magnitude, and economic cost of an event.

i) *What obstacles have emerged in those procurement designs, and how have they been addressed or resolved?*

In California, limited quantities of Long Duration Energy Storage projects entered the interconnection queue before 2021. However, over the past two years, the “cluster” (CAISO’s process for studying generation interconnection requests) submissions (C14 and C15 in the below graph) have brought the queue to more than 5.5 times greater than the CPUC’s2022 “Preferred System Plan (PSP)” which was 85 GW for 2035; the CPUC’s PSP includes a target of 1,000 MW of long-duration energy storage by 2032. There are more than three times the 100% clean energy portfolio needed by 2045 already in the CAISO interconnection queue. This is the most significant challenge because the cluster studies are meaningless at these levels. Reducing and shrinking the queue to viable projects only, meaning “first ready,” is a top priority for CAISO.



	C01	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15
Total MW Active	300	746	200	301	592	5,108	5,388	6,501	5,362	14,82	16,32	65,56	354,0
Cumulative Total MW	300	1,046	1,246	1,546	2,139	7,246	12,63	19,13	24,49	39,32	55,64	121,2	475,2
CAISO Historical Peak	52,06	52,06	52,06	52,06	52,06	52,06	52,06	52,06	52,06	52,06	52,06	52,06	52,06
2033 Base	69,22	69,22	69,22	69,22	69,22	69,22	69,22	69,22	69,22	69,22	69,22	69,22	69,22
2035 Base	85,01	85,01	85,01	85,01	85,01	85,01	85,01	85,01	85,01	85,01	85,01	85,01	85,01

E. *What large-scale energy storage procurement designs used in other states are seen as best practices?*

In 2010, California established the first energy storage target in the nation with the passage of Assembly Bill 2514, which established a target of 1,325 MW of energy storage by 2020 for the state's three investor-owned utilities. The concept of the targets was that the solicitations of energy storage would occur every two years to allow for a phased implementation.

CPUC has also begun issuing periodic Integrated Resource Planning (IRP) procurement orders that include a carve-out for long lead-time resources- due to the difficulties of quickly procuring long-lead-time resources- which means there is a tighter delivery requirement for non-long lead-time resources. From a delivery perspective, long lead time resources need to be competitive only within their group and do not have to compete with all generic eligible resources. CPUC supports this because they do not want to see "a reduction in the system's ability to supply firm and/or dispatchable energy when the grid needs it most." CPUC requires a minimum of 2,000 MW of long lead time resources, of which 1,000 MW must be long-duration storage. CPUC requires long-duration energy storage resources to discharge for a minimum of 8 consecutive hours. However, as a qualitative factor, it encourages Load Serving Entities (LSEs) to include longer durations and multi-day capability in their solicitations.

i. *What obstacles have emerged in those procurement designs, and how have they been addressed or resolved?*

A significant obstacle that has emerged over the past several years that negatively impacts long-duration and short-duration energy storage procurement goals and designs is supply chain delays that affect both transmission providers and interconnecting customers who are developing and interconnecting energy storage projects in the various ISO/RTO managed transmission systems. The specialized equipment and materials needed for these energy storage projects are often sourced by a relatively small number of vendors who are experiencing a backlog and shortage of equipment and materials, as well as a shrinking labor pool, all of which has contributed to delays to the construction and interconnection of energy storage projects. Along with these vendor issues, the PJM and MISO interconnection queue processes have an extensive backlog of projects attempting to interconnect that are causing additional delays. For these reasons, Vistra recommends that the Illinois Power Agency carefully consider the impact of these supply chain factors when establishing the energy storage procurement plan target dates.

F. *What best practices in other states for potential tariff design for the participation and/or aggregation side energy storage from should be examined by the IPA?*

As for aggregation side energy storage, Vistra is not aware of such an approach elsewhere but would note that aggregation has proven successful in Illinois and other states in providing communities the ability to aggregate customers for retail choice and benefit from competition, but perhaps this should be considered for development and adoption after the state gains more experience with energy storage and an initial procurement process. Should the state proceed with an aggregation program, it should be done through a competitive process.

G. *To model the impact of the deployment of energy storage in Illinois, the Agency and its consultants will need to make assumptions about the size, location, duration, technology, and other key attributes of energy storage projects that might successfully participate in energy storage procurements. What recommendations do stakeholders have for creating a proxy set of energy storage projects for modeling?*

Vistra offered proxies of various sizes and technologies for consideration in the first data request and recommends the Illinois Power Agency, and its consultants, prioritize sites that already have the necessary permitting, land use, interconnection, and transmission headroom in place to allow for the relatively rapid development of energy storage projects. Importantly, these sites maximize the use of existing transmission infrastructure, thus avoiding the study process and delays inherent in developing new transmission infrastructure.

Competition and Market Considerations

Vistra strongly believes that, in the long run, competitive market forces provide the best avenue for the cost-effective and sustainable deployment of energy storage. However, Vistra also recognizes that today's energy markets were not designed with clean energy as a goal and that transition mechanisms, such as those in SB 1587, are necessary to achieve a long-run sustainable clean energy market. Specifically, current market structures and market dynamics, including capacity pricing, in both PJM and MISO (including PJM-ComEd and MISO-Zone 4) do not support competitive, market-based development of utility-scale storage. Therefore, government-provided incentives for energy storage development may continue to be needed during a transition period until market forces – principally increased penetration of non-dispatchable resources that require the support of dispatchable storage systems so that grid reliability be maintained – are sufficient to drive the demand for storage systems to support those resources. Current capacity market structures, pricing in the two RTO regions, and the still-relatively nascent penetration of non-dispatchable renewable generation on the bulk power grid are the principal "barriers to realizing such benefits" of energy storage.

Benefits of Battery Energy Storage System

Battery energy storage is flexible, can be deployed quickly, has multiple applications, and can produce numerous value streams. Vistra sees a growing market in coupling energy storage with renewable and traditional generation facilities. The value chain of deploying energy storage in this way extends from the generation facilities to the grid to the end-use customers. For example, batteries often support an existing generation asset where the cycle requires daily charging.

In the near term, utility-scale energy storage will most likely replace investment in new peaking plants and enable otherwise non-dispatchable facilities to provide ancillary services, such as non-spinning reserves (instantaneous start). In these cases, storage can help normalize existing markets from distortive effects and, at the same time, potentially reduce future costs to consumers by delaying the cost of new build.

Energy storage does not need to be a “rate-based” investment. Vistra and other competitive companies can contract electric utilities responsible for delivery services to provide reliability services from storage projects. This approach maximizes the value of the energy storage system because the batteries would provide the delivery utilities with electricity transmission and distribution-related reliability services while also providing energy and ancillary services. Utilities could conduct competitive bidding processes for the services they require, and then the competitive company would be able to optimize other benefits from the energy storage system.

Front-of-the-meter (FTM) services, such as the examples above, are not the only areas where energy storage brings value. Behind-the-meter (BTM) energy storage facilities most directly provide the value of energy storage systems to the retail customer (both residential and non-residential). This value includes better power quality / reliability, pairing with distributed energy generation, microgrids, or demand shaving (helping to reduce demand charges). Vistra believes that growth in energy storage systems at the retail/BTM level will be primarily driven by the value the retail customers perceive to their particular applications.

For example, the addition of onsite energy storage systems can enable better power quality and provide continuity of power or operations during an outage event/storm. Consumers of all sizes and types will be able to more effectively avoid the dangerous and costly outcomes of power outages, including shrinkage (e.g., lost produce or product and materials); building damage, and equipment repairs (e.g., pipe leaks/flooding, plastics extruder cleaning, etc.); health issues (e.g., failure of essential equipment or medicine); among others. These costs/consequences affect many more households and businesses in a material way than just the power disruption alone. Additionally, having BTM storage would enable the customer to participate in demand response or other market programs, allowing the customer to access valuable revenue streams or cost reductions while benefiting the broader grid.

As enumerated in the table below, multiple value streams contribute to energy storage economics for both FTM and BTM applications.

Value Streams			
	Value	**Type**	**Storage Can:**
FTM	Energy Price Arbitrage	Optimization	• Charge when power prices are low / discharge when power prices are high
FTM	Ancillary Services	Optimization	• Provide frequency regulation, load following, reserves, etc.
FTM	Policy Incentives	Financial	• Batteries may qualify for investment tax credit ("ITC"), bonus depreciation, and other incentives / subsidies by state / market / locality
FTM	Black Start	Reliability	• Restart offline thermal power plants
FTM	Voltage Regulation	Quality	• Absorb power to balance reactance in the grid
FTM	Defer Investment in Transmission & Distribution ("T&D")	Reliability	• Install at T&D bottlenecks to avoid the need to invest in additional T&D infrastructure
FTM	Renewable Integration	Optimization, Reliability	• Avoid curtailments of renewables and reshape their output to match supply and demand
FTM	Capacity / Peaker Replacement	Reliability	• Provide system capacity similar to a peaking plant
BTM	Avoid Demand Charge	Financial	• Offset peak demand and lower demand charges
BTM	Pair with BTM Solar	Optimization, Reliability	• Optimize output of BTM solar plants and avoid curtailment
BTM	Power Reliability / Quality	Quality, Reliability	• Allow customers to avoid service interruptions due to grid events

In addition, for as long as the state provides incentives for the development of utility-scale energy storage systems during the transition to fully competitive market structures and processes, it is appropriate for the state to consider other factors in addition to the direct benefits (and costs) of adding energy storage to the grid. These factors can include use of former and existing power plant sites and "brownfield" sites (broadly defined as above), supporting remediation and (re)development of environmental justice communities, providing employment benefits to former generating plant workers, developing training programs (including partnering with training programs offered by local institutions such as community colleges), and implementing diversity, equity and inclusion programs in connection with the development, construction, and operation of new energy storage facilities; as well the general economic development and fiscal (e.g. property taxes) benefits of the energy storage projects to the local communities in which the facilities are located.

Vistra Comments Related to Lake Michigan Wind as in HB 2132

As the State of Illinois considers facilitating large-scale wind generation in Lake Michigan through a mechanism like HB 2132, policymakers should consider encouraging or requiring the potential development to interconnect at power generation facilities that already have existing interconnections, transmission lines, and similar infrastructure that could quickly be repurposed and retrofitted with battery energy storage facilities. For instance, a natural gas power plant that may be required to close under the Energy Transition Act would be an ideal location for the wind project's interconnection and the parallel development of battery energy storage assets. The renewed plant site(s) would produce property tax revenue that would be lost due to the retirement of the natural gas-fueled assets while continuing the historical use of the industrial property for use in the production, transmission, and use of electricity for the benefit of area residents, businesses, and institutions.

About Vistra

Vistra (NYSE: VST) is a leading Fortune 500 integrated retail electricity and power generation company based in Irving, Texas, providing essential resources for customers, commerce, and communities. Vistra combines an innovative, customer-centric approach to retail with safe, reliable, diverse, and efficient power generation. The company brings its products and services to market in 20 states and the District of Columbia, including six of the seven competitive wholesale markets in the U.S. Serving approximately 4 million residential, commercial, and industrial retail customers with electricity and natural gas, Vistra is one of the largest competitive electricity providers in the country and offers over 50 renewable energy plans. The company is also the largest competitive power generator in the U.S. with a capacity of approximately 37,000 megawatts powered by a diverse portfolio, including natural gas, nuclear, solar, and battery energy storage facilities. In addition, Vistra is a large purchaser of wind power. The company owns and operates the 400-MW/1,600-MWh battery energy storage system in Moss Landing, California, the largest of its kind in the world. Vistra is guided by four core principles: we do business the right way, we work as a team, we compete to win, and we care about our stakeholders, including our customers, our communities where we work and live, our employees, and our investors. Learn more about our environmental, social, and governance efforts and read the company's sustainability report at https://www.vistracorp.com/sustainability/.

Conclusion

Vistra appreciates the Agency's consideration of these comments and looks forward to using our experience and expertise in energy storage systems to contribute to the Energy Storage Study and further development of energy storage procurement legislation.

Respectfully submitted on behalf of Vistra by:

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