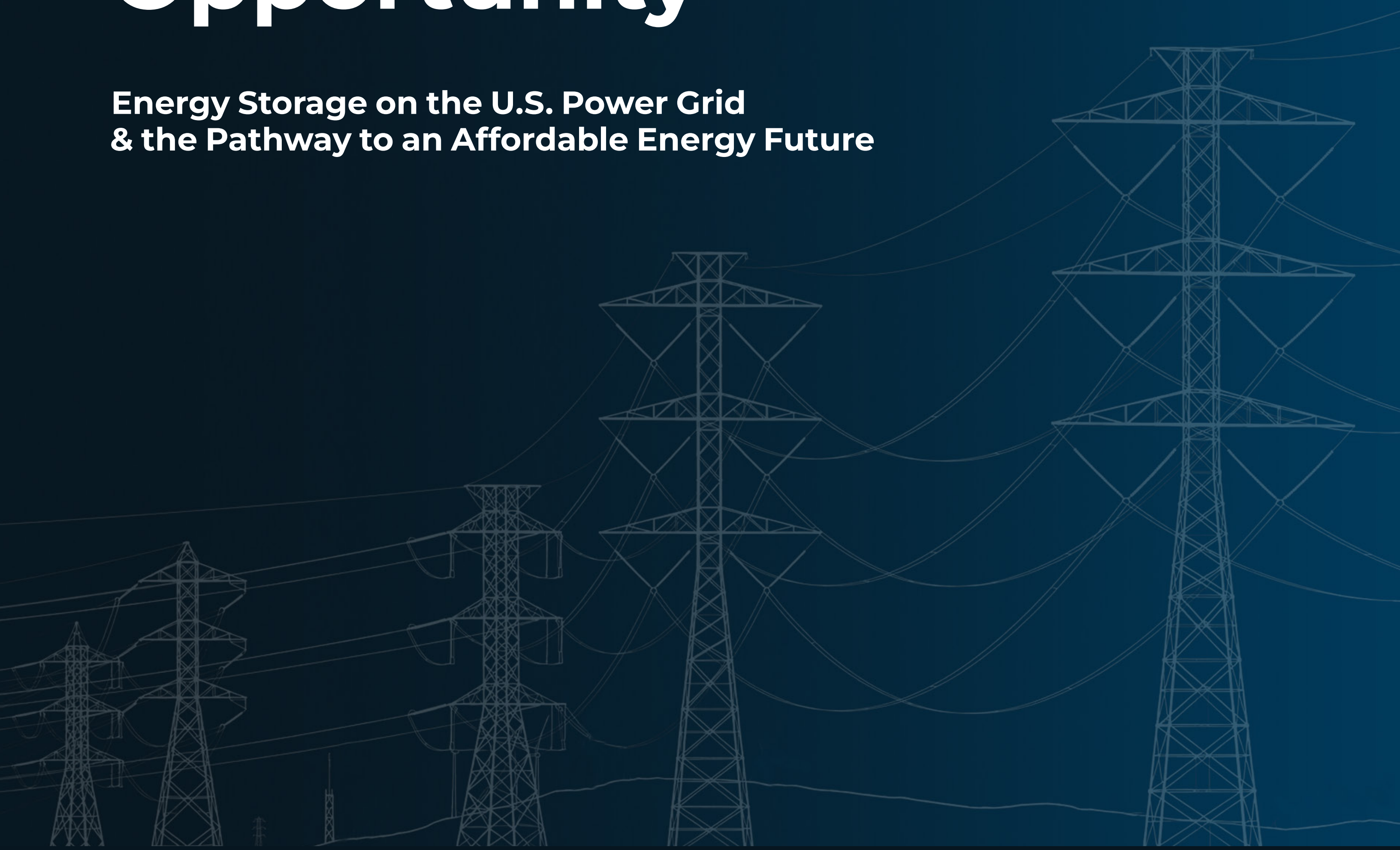
U.S. ENERGY STORAGE COALITION

The Terawatt-Hour Opportunity

Energy Storage on the U.S. Power Grid & the Pathway to an Affordable Energy Future



ENERGY STORAGE COALITION

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LETTER FROM THE U.S. ENERGY STORAGE COALITION

A Vision for Energy Storage in the United States

The Terawatt-Hour Opportunity

America's power system is in a period of extraordinary growth.

Electricity demand is accelerating after decades of relative stability, driven by artificial intelligence and data centers, advanced manufacturing, electrification, and the broader expansion of the American economy. To meet these historic demands, the country must deliver power that is affordable, reliable, and available when and where it is needed. Energy storage has proven essential to meeting that challenge.

Over the past decade, grid-scale energy storage has grown from an emerging technology into a critical component of America's power infrastructure. Energy storage is now operating at-scale in several states across the country and is entering its next phase of market growth.

This report presents the U.S. energy storage industry's vision for the next phase: a path to **1 terawatt-hour/1,000 gigawatt-hours of grid-scale energy storage deployed across the United States by the end of 2032**. Here's what 1 terawatt-hour of energy storage would mean for the American power grid:

- More affordable electricity
- Less power outages and grid emergencies across the country
- Hundreds of thousands of American jobs in manufacturing, engineering, and construction trades
- Hundreds of millions of local tax revenue to pay for schools, new roads, and first responders
- A power grid that's more resilient and flexible in the face of extreme weather

Achieving this scale would deliver benefits far beyond the power grid itself. An analysis finds that scaling energy storage over the next five to 10 years could generate more than **$250 billion in cost savings for American families and businesses** by making our power grid more flexible and efficient.

Energy storage is a force multiplier for the entire American power system. The technology is designed to complement and improve all resources — generation, transmission, distribution, and large end-users — by allowing infrastructure to operate more efficiently.

Energy storage helps us get more value from existing resources we have on the electricity system. Energy storage makes the power grid more efficient and affordable by capturing low-cost electricity that may otherwise be wasted and delivering it when it's needed most. By reducing daily or seasonal price spikes, relieving pressure on transmission infrastructure, and making better use of existing generation, energy storage helps our country meet growing demand for power in the most cost-effective manner.

Realizing this vision of building 1 terawatt-hour of energy storage requires a dominant American industrial manufacturing base. As the energy storage sector delivers on its commitment to invest $100 billion into American grid battery manufacturing, we envision achieving 150 GWh of annual U.S. battery cell and energy storage system manufacturing capacity by 2030, fueled by American and allied battery materials and critical minerals. This new, dynamic, domestic supply chain will be capable of supporting the U.S. power grid and national energy security needs at home while positioning American companies to lead in a rapidly growing global market for advanced energy technologies.

America's next era of economic growth will require a power system that delivers more electricity, greater reliability, and lower costs. Achieving that future means not only building new energy infrastructure, but making every megawatt of generation and every mile of transmission work harder for American families and businesses.

Energy storage makes that possible.

Noah Roberts
Executive Director
U.S. Energy Storage Coalition

Tristan Doherty
Chief Product Officer
LG Energy Solution Vertech

Chair of the U.S. Energy Storage Coaltion

Kiran Kumaraswamy
Global Head of Policy, Business Development, and Autobidder
Tesla

Chair of the U.S. Energy Storage Coaltion

1 Terawatt-Hour of Flexibility & Efficiency

ENERGY STORAGE ON AMERICA'S POWER GRID IN 2032

1 Terawatt-Hour
Energy Capacity

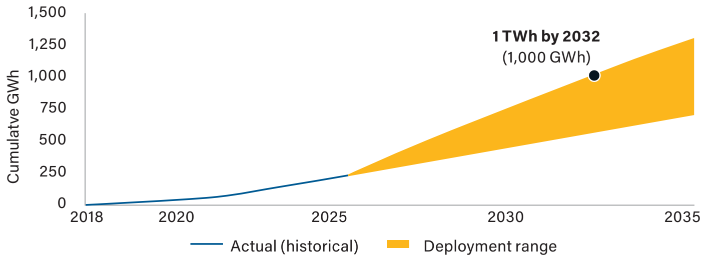
225 GW
Power Capacity

The 2032 Outlook: Building Toward 225 GWs and 1,000 GWh of Energy Storage Capacity

Energy storage is increasingly being built because the American power system needs what it can provide: fast, flexible capacity that can be deployed quickly, strengthen reliability, reduce costs, and make better use of the generation and grid infrastructure already in place. As electricity demand accelerates and the value of flexibility increases, storage is moving from a complementary grid resource to a fundamental component of how America builds and operates its power system.

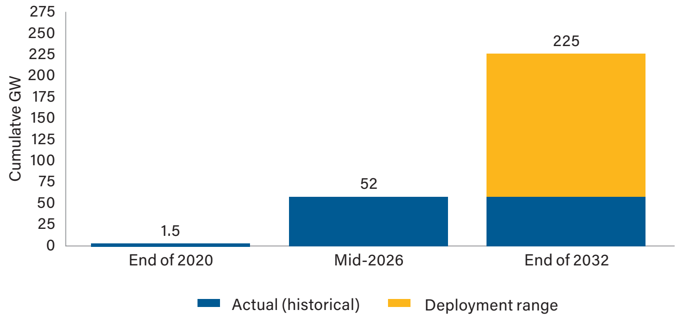
The U.S. energy storage industry has undergone one of the fastest expansions of any part of the American power sector. In just a few years, energy storage has moved from an emerging technology to a foundational backbone and Swiss Army knife of the American power grid. The question for the industry is no longer whether energy storage will play a significant role in the American power system, but how quickly it can scale to meet the country's growing need for affordable, reliable power.

Cumulative Installed Storage Capacity (GWh)



Historical actuals (2018-2025) plus a range of deployment range scenarios through 2035, assessed based on cumulative estimates from Wood Mackenzie, ACP, BNEF, McKinsey & Company, Baringa Partners, Aurora, and E3. Cumulative GWh, U.S. total.

Cumulative Installed Storage Capacity (GW)



Why the U.S. grid-scale energy storage market is poised to accelerate:

The grid needs more flexibility

The power system is more dynamic: electricity supply and demand change more rapidly, renewable generation has expanded, and grid operators increasingly need resources that can respond instantly, shift power across hours, and provide capacity when it is most valuable. Storage is uniquely capable of doing all three.

America needs more power and needs it faster

After decades of relatively flat electricity consumption, load growth from manufacturing, electrification, AI, and other large power users is creating an urgent need for new capacity. Storage can be deployed quickly, help unlock constrained grid capacity, and make existing generation and transmission infrastructure work harder while longer-lead infrastructure catches up.

Storage makes the power system more affordable

Storage is increasingly valuable because it can replace expensive peak power, reduce price spikes, defer costly grid investments, and get more capacity from infrastructure already paid for by consumers. Rather than solving each grid need with a separate investment, storage can provide capacity, energy, congestion relief, and essential grid services from the same asset.

Delivering Affordable Electricity for America

Energy Storage Will Drive Significant Cost Savings

Energy storage has proven to deliver more affordable electricity by making the entire power system more efficient and productive. **By soaking up excess electricity that would otherwise be wasted, energy storage can essentially supply the most expensive periods of power generation with low-cost energy reserves.** The result is a power system that can serve more demand with the infrastructure already in place, reducing total system costs and protecting consumers.

RAPIDLY SCALING ENERGY STORAGE DELIVERS SIGNIFICANT COST SAVING

$250 Billion

Estimated Cumulative Energy System Cost Savings for the U.S. Power Grid

$1,550

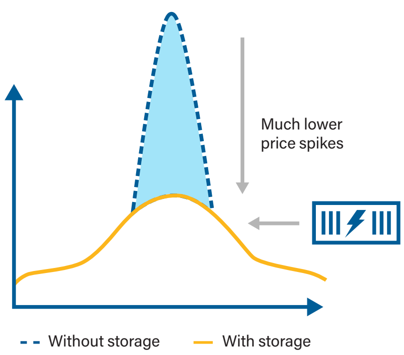
Estimated Cumulative Energy System Cost Savings Averaged Across America's 160+ Million Ratepayers

How Energy Storage Delivers Cost Savings and Electricity Affordability

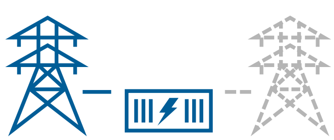
Power grid scenario modeling finds that broadly scaling energy storage deployment over the next decade could reduce the cost of building and operating a reliable U.S. power system by more than $250 billion over the next decade, compared to alternative scenarios where energy storage deployment is constrained. That estimate may prove conservative: storage can also suppress wholesale price spikes, reduce congestion and peak demand, defer transmission and distribution upgrades, and lower other grid operating costs — benefits that can extend beyond those fully captured in long-term capacity-expansion modeling.

See pages 7, 8, and 17 for more information about power grid scenario and cost modeling.

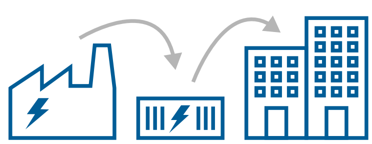
1 LOWER THE COST OF PEAK DEMAND



2 AVOID OR DEFER EXPENSIVE INFRASTRUCTURE



3 GET MORE FROM THE EXISTING GRID



Flexible, Dispatchable Capacity

Storage charges when electricity is abundant and inexpensive and discharges when demand and prices are highest. That reduces reliance on the most expensive generation and lowers peak-driven capacity and energy costs.

Faster, Cheaper, and Smarter

Storage can relieve congestion and serve growing demand without immediately building new transmission, distribution, or generation infrastructure. This reduces capital costs that ultimately flow through to customer bills.

More Value from the Grid

Storage shifts electricity across time and provides flexibility, allowing existing power plants and transmission lines to operate more efficiently and at higher utilization. In effect, storage increases the usable capacity of the grid without requiring an equivalent increase in physical infrastructure.

The Market Outlook U.S. — Energy Storage Deployment

Utility-scale battery storage capacity has increased from 1.5 GW at the end of 2020 to nearly 52 GW by mid-2026. This represents a 35-fold increase in roughly five and a half years, or 3,400% growth. The industry installed a record 18.9 GW across all market segments in 2025 alone, 52% more than the previous year. And the market continues to expand. Another 3.3 GW was installed in the first quarter of 2026, the strongest first quarter on record.

As the global supply chain for battery storage has matured, including the rapid rise of battery factories in the U.S., the technology has become increasingly the most cost-effective megawatt of capacity you can add to the power grid. Yet, many applications and power grid services that energy storage can provide are not fully integrated into utility planning and regional electric grid market operations. As energy storage sees increased deployment, broader applications, and growing value, market outlooks indicate the technology is on track for sustained growth.

U.S. Energy Storage Market Expected to Grow Over Next Decade

Energy storage deployment growth across the United States relies on many factors that contribute to the pace and scale of deployment, including regional demand for power, supply chain constraints for energy technologies and other energy infrastructure, market design and state policy, and technology costs.

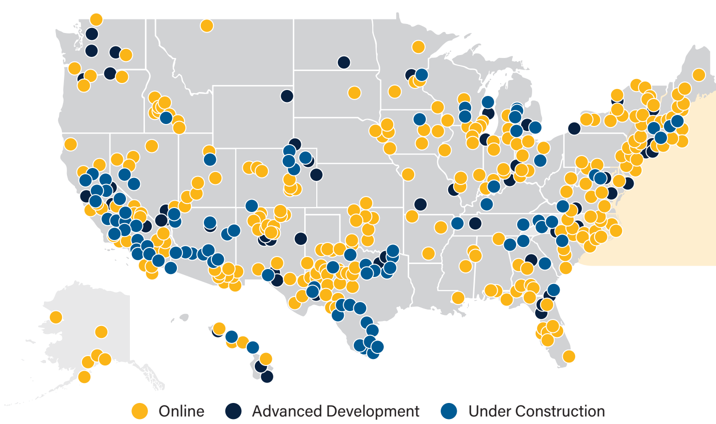
This market outlook is based on an assessment of numerous independent market reports that provide a range of anticipated energy storage deployment in the United States.

Aiming for 1 TWh and 225 GW of energy storage capacity by 2032 would represent a more than **300% increase in power capacity and a 500% increase in energy capacity** for energy storage resources over the next five years.

Energy storage capacity will reach more than 20% of current U.S. peak electricity demand.

Utility-scale battery storage capacity has increased from just 1.5 GW to nearly 52 GW by mid-2026. This represents a **35-fold increase** in roughly five and a half years, or **3,400% growth**.

Reaching 1 TWh by 2032 of installed energy storage capacity requires a more than **25% annual growth rate** from mid-2026 deployment levels.



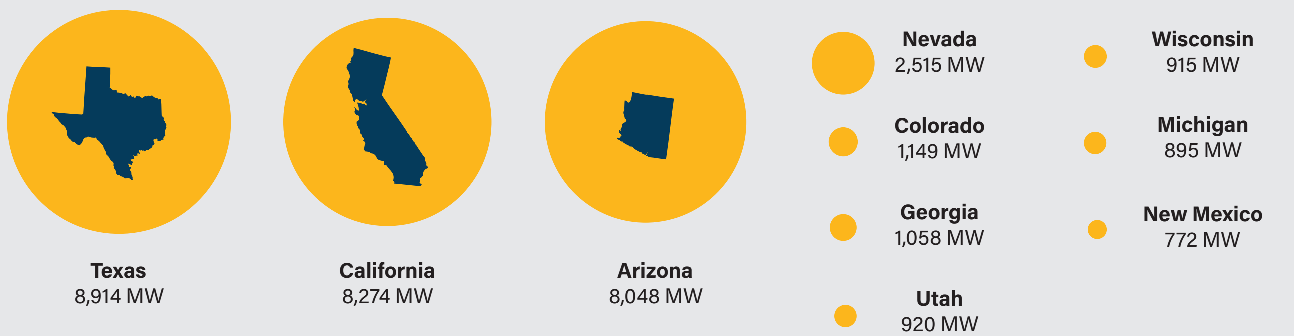
Energy storage resources are currently operating or planned in all 50 American states. Over the next decade the outlook anticipates significant geographic diversification.

225 GW of energy storage capacity could provide peak power supply to the entirety of **Texas, California, Florida, and Michigan combined**.

States are Rapidly Scaling Energy Storage Infrastructure

Energy storage represents the largest volume of near-term capacity additions to the power grid. Billions of dollars are being invested in projects that are under construction or the advanced development stage.

Storage Pipeline Capacity by State



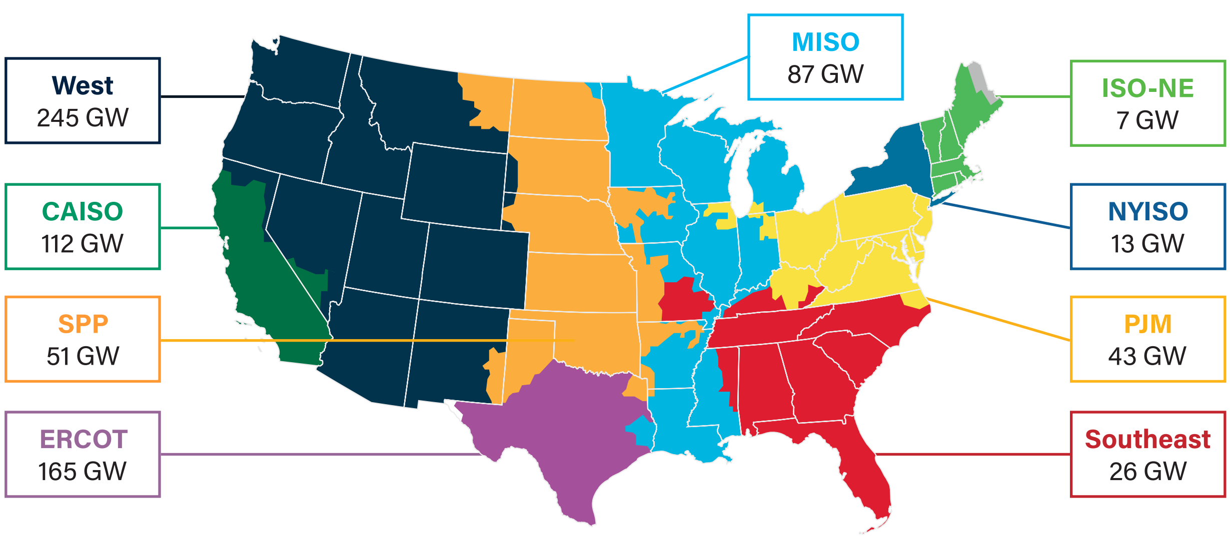
Source: American Clean Power Association 2025 Annual Market Report

Regional Electricity Market Queues

Currently, roughly two-thirds of operating energy storage capacity are located in the Electric Reliability Council of Texas (ERCOT) and California Independent System Operator (CAISO) territories, reflecting the early concentration of energy storage project development in U.S. regions with the most acute reliability challenges. As market designs evolve and other regions contend with historic load growth, the geographic diversity of energy storage deployment is expected to expand and even out.

While California and Texas, the two most populous states with burgeoning industrial economies, continue to see significant energy storage resources in the longer-term pipeline, regional electricity market queues indicate that the markets operating in the Great Plains, Midwest, Central Southern States, and Mid-Atlantic are poised to see substantial energy storage development. How quickly, and at what scale, may depend on ongoing efforts to reform outdated market structures that limit energy storage participation. Meanwhile, utility procurement and offtake agreements with industrial power users will put pressure on market inertia to more quickly adopt changes to properly incorporate energy storage resources.

Capacity in Regional Queues: Cumulative Storage



Source: Lawrence Berkley National Laboratory, U.S. Department of Energy
Note: Storage capacity estimates presented here are subject to important data limitations, including precise breakdown of storage capacity within hybrid resources.

Speed to Power: U.S. Power Grid Needs Energy Storage to Meet Near-Term Demand

The United States stands at an energy inflection point. Historic demand growth driven by electrification, industrial reshoring, and the rapid proliferation of AI data centers is placing unprecedented strain on the power grid. Energy storage is a foundational technology that enables the United States to cost-effectively manage this challenge.

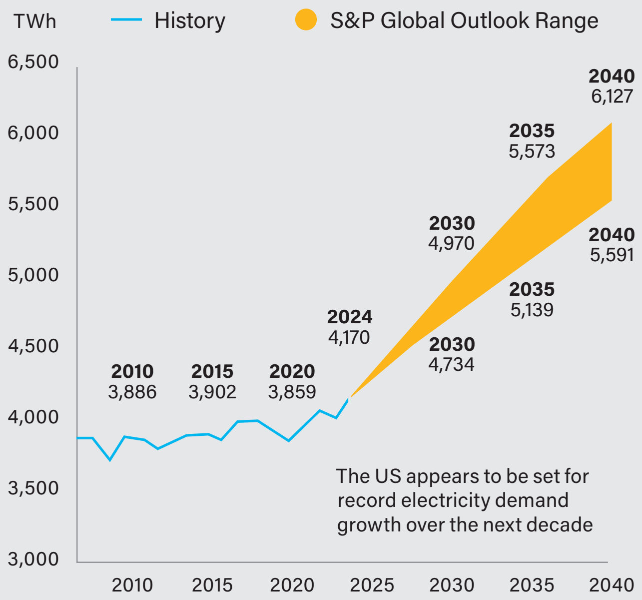
As a manufactured, modular technology, energy storage can be deployed in a fraction of the time of other energy infrastructure. This advantage in speed to power will be essential for quickly boosting grid capacity and avoiding power supply crunches that often lead to dangerous grid conditions and costly price spikes.

SNAPSHOT: THE U.S. ENERGY STORAGE DEVELOPMENT PIPELINE

56 GW	23 GW	33 GW
Energy Storage Capacity in the Pipeline Across the U.S.	Energy Storage Capacity Currently Under Construction	Energy Storage Capacity in Advanced Development

Sources: American Clean Power Association Q2 2026 Market Report

US Lower 48 Net On-Grid Electricity Demand



Source: U.S. National Power Demand Study, S&P Global

Market Reality of Connecting to the Grid

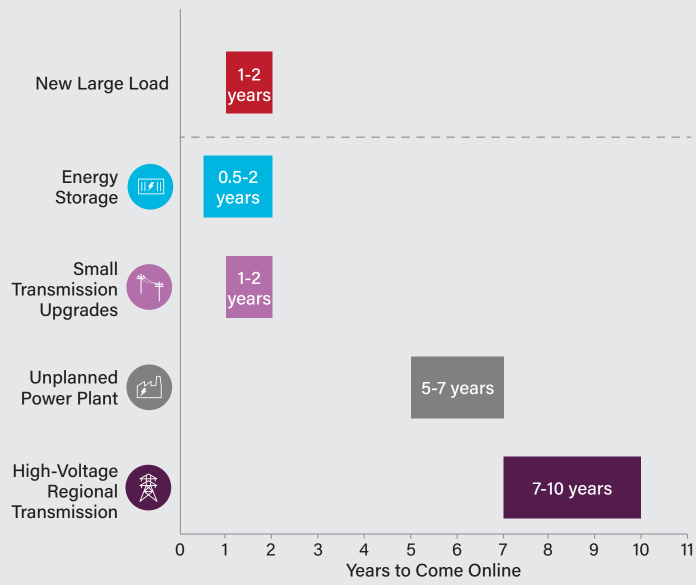


Photo credit: Eolian

Energy Storage Delivers $250 Billion in Energy Cost Savings by 2035

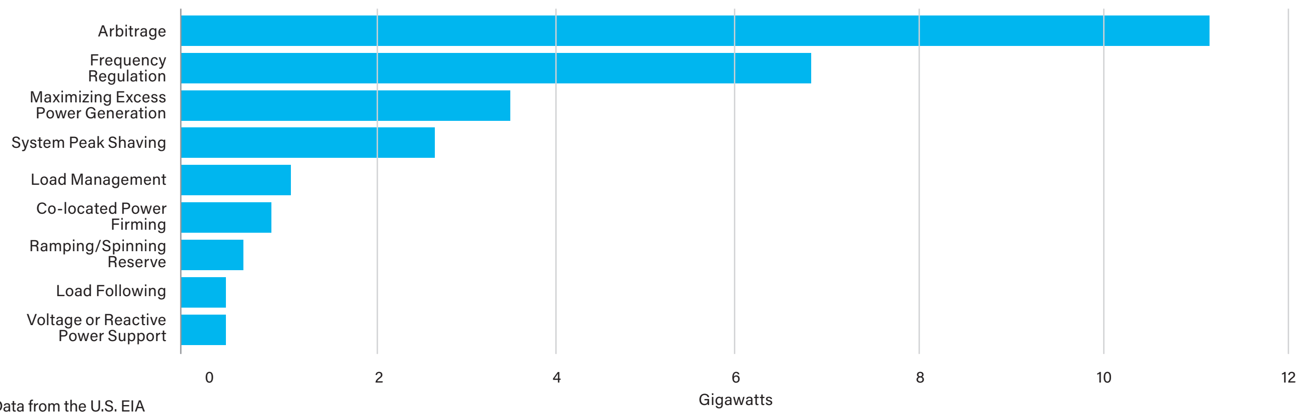
Energy storage is emerging as one of the most powerful tools for lowering the cost of America's power system. Modeling finds that broadly scaling energy storage deployment, beyond 850 GWh across the U.S., could generate significant capital cost savings and represents the least-cost scenario for building and operating a reliable U.S. grid. Scaling energy storage deployment to more than 850 GWh, or higher depending on load growth, could generate at least $250 billion in cost savings for the American energy system over the next decade. While these savings reflect upfront capital cost benefits, the affordability benefits of energy storage are likely far greater given storage's ability to replace expensive peak generation, defer costly infrastructure investment, reduce congestion and energy waste, and get more value from the power plants and transmission lines already serving consumers.

Energy Storage is the Swiss Army Knife of Our Modern Power Grid

Unlike most power resources designed primarily to perform a single function, storage can provide many different services from the same asset. Batteries can absorb electricity when it is abundant and would otherwise be curtailed or wasted, deliver it when demand and prices are highest, respond almost instantly to changes in supply and demand, provide reserves when other resources unexpectedly go offline, and support the frequency and voltage needed to keep the grid stable.

This unique flexibility allows storage to move power across time and rapidly respond to changing grid conditions, helping the power system avoid both wasted energy and inefficient investments in generation and infrastructure that may be needed only during a small number of hours each year. The result is a more flexible and efficient power system that gets more value from both the electricity it produces and the infrastructure already in place.

Applications for U.S. Energy Capacity (2024)



Data from the U.S. EIA

Texas: A Blueprint for Leveraging Energy Storage to Lower Prices and Strengthen Reliability

A reliable grid is often a more affordable grid. But how you make your power grid more reliable matters when it comes to electricity affordability for American households and businesses.

Energy storage has proven that, when deployed at scale, it can achieve remarkable results. In Texas, energy storage has demonstrated the breadth of its benefits and provides a blueprint for how the technology can improve the flexibility and efficiency of power grids across the United States.

15 GWs
Energy Storage Deployed between 2020 and 2025

$1.5 Billion
Energy Cost Savings During Winter Storms and Summer Heat Waves in 2024

Zero Grid Emergencies
in 2025 after peaking at 13 emergencies in 2023

Sources:
Aurora Research — Batteries in ERCOT Saved $750 Million during Winter Peak Demand
American Clean Power Association — Significant Energy Storage Capacity Additions Keep Costs Low and Power Reliable in Texas

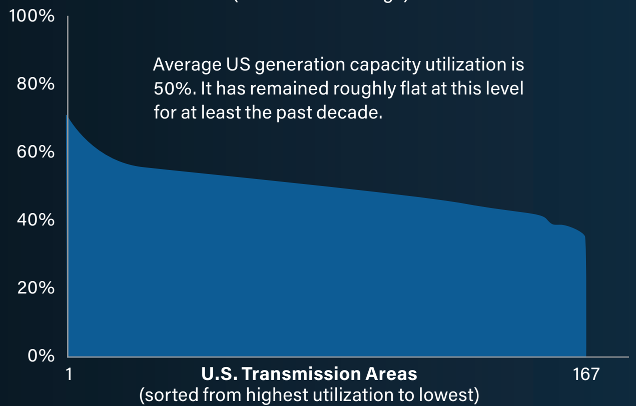
Energy Storage and Grid Utilization

The economic value of improving grid utilization is substantial. A 2026 analysis from The Brattle Group finds that much of the U.S. power system is underutilized because generation, transmission, and distribution infrastructure must be built to accommodate relatively short periods of peak demand. Brattle estimates that increasing system utilization by just 10% could reduce electricity rates by approximately 3.4%, while improved utilization nationally could reduce consumer electricity bills by $110 billion to $170 billion over the next decade. The report identifies energy storage among the key technologies capable of unlocking this unused capacity.

Average U.S. Power Generation Utilization is Approximately 50%

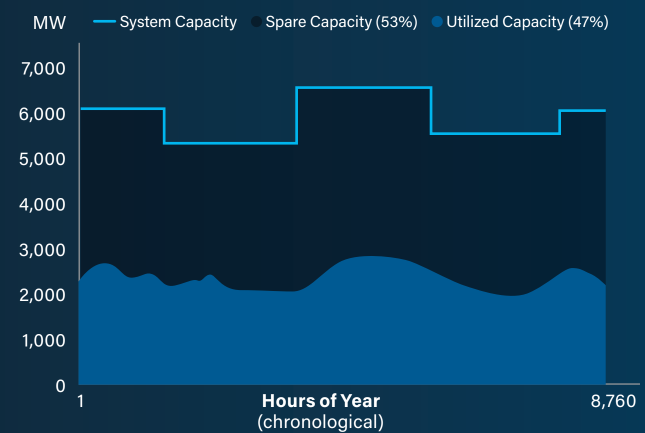
US Generation Capacity Utilization, by Transmission Area

(2022–2024 Average)



Note: System utilization is represented here as a region's average annual electricity demand divided by its peak demand plus an illustrative planning reserve margin of 15%. The figure shows average annual utilization factors from 2022-2024 for 167 US transmission areas, which are roughly consistent with utility/ISO load boundaries. Transmission area data sourced from ERCOT Form 714, as compiled by Hitachi Vantara's Velocity Suite.

Illustrative Hourly Output from Generation Fleet Over a Year



Note: System capacity offers by season based on variation in resource availability such as renewable generation and thermal planned and maintenance outages. We show illustrative seasonal derates driven by thermal planned outages in a system primarily reliant on thermal rated capacity.

Source: *The Brattle Group — The Untapped Grid: How a Better Utilized Power System Can Improve Energy Affordability*

Four Ways Energy Storage Improves Utilization

- **Maximizing Generation Utilization.** Energy storage captures electricity during periods when generation is abundant or underutilized and shifts it to periods of higher demand, allowing existing generating assets to boost their contribution to the power grid and serve more load more efficiently. This includes both energy storage co-located and built alongside generation and standalone energy storage resources.
- **Increasing Transmission Utilization.** Storage increases the productive use of existing transmission infrastructure. Strategically located energy storage can function as a "virtual transmission" resource, charging when transmission capacity is available and discharging on the constrained side of the grid when it is needed most. By relieving congestion and shifting power across time, storage can increase the effective capacity of existing transmission infrastructure and, in some circumstances, defer or reduce the need for traditional transmission upgrades.
- **Unlocking Interconnection Capacity.** Storage can utilize existing, surplus, or otherwise stranded interconnection capacity through co-location or hybridization, allowing additional resources to connect without requiring entirely new interconnection infrastructure. Because energy storage can be built much more quickly than many other types of infrastructure, ratepayers benefit from regulatory frameworks that take advantage of and encourage its speed to power through existing points of interconnection.
- **Expanding Load-Serving Capability.** Storage can enable existing grid connections to accommodate greater electricity demand by managing short-duration peaks, reducing the need to size generation and grid infrastructure around a customer's maximum instantaneous demand. Energy storage sited alongside large industrial power users can also enable load management through load reduction or load following, leveraging energy storage to reduce the impact of existing load connected to the grid.

EMERGING MARKET TRENDS

Energy Storage and Industrial Power Demand

Electricity demand growth is being driven in significant part by advanced manufacturing, data centers, AI infrastructure and other large industrial users that require enormous amounts of dependable power — and often need it faster than traditional grid infrastructure can be built.

Energy storage provides a critical bridge between those new loads and the power system: it can be deployed rapidly, shift electricity to the hours when it is most needed, and help utilities serve substantially more demand from existing generation and grid infrastructure. Rather than forcing communities to absorb the full cost and grid impact of new industrial demand, storage provides a flexible buffer that can help bring economic development online faster while protecting reliability and affordability for existing customers.

Energy Storage Protects Communities and the Power Grid from Strain

Large industrial facilities can add hundreds or even thousands of megawatts of concentrated demand to a local power system, creating new peaks and potentially requiring significant investment in generation, transmission, and distribution. Storage helps insulate the broader grid from that impact by charging when capacity is available and discharging when the system is most constrained, effectively reshaping when a large customer draws power from the grid. This can reduce peak-driven stress, mitigate congestion, and lessen the need to build infrastructure around the maximum instantaneous demand of a new facility — helping ensure that industrial growth does not come at the expense of reliability or affordability for surrounding communities.

Energy Storage Provides 99.999% Reliability Required by Large Industrial Energy Users

For many of the largest new electricity users, reliable power is not simply preferred — it is a fundamental operating requirement. Data centers, semiconductor facilities, advanced manufacturing, and other mission-critical operations can face significant economic consequences from even momentary disruptions. Storage is uniquely suited to these requirements because batteries can respond nearly instantaneously to changes or interruptions in grid power, provide seamless ride-through capability, and complement other onsite and grid resources to create multiple layers of redundancy. That combination of speed, control, and flexibility makes storage an increasingly important component of power architectures designed around the conceptual "five-nines," or the aspirational effort of industrial power users to have available and reliable power for 99.999% of any given year.

Maximizing Grid Utilization and Containing Infrastructure Costs

Power plants and transmission infrastructure are not utilized at their maximum capacity every hour of the year, yet traditional grid planning can require billions of dollars of new infrastructure to accommodate relatively short periods of peak demand. Storage can capture available capacity during less-constrained hours and deliver it during periods of greatest need, increasing the usable capacity of existing infrastructure and potentially deferring or reducing new investment. The result is a more efficient approach to growth: serve more electricity demand, use existing assets more productively, and build expensive new infrastructure where — and when — it is actually needed.

Photo credit: DTE Energy

DTE ENERGY: USING STORAGE TO TURN LOAD GROWTH INTO AN AFFORDABILITY OPPORTUNITY

DTE's agreement to serve a new 1.4 GW data center in Michigan demonstrates how energy storage can help accommodate enormous new electricity demand while delivering benefits to existing customers. The data center will fully fund approximately 1.4 GW of new energy storage, helping DTE serve the new load without shifting those incremental costs onto existing ratepayers. At the same time, the new customer will contribute substantially toward the fixed costs of DTE's broader power system — an arrangement DTE estimates will generate approximately $300 million in annual affordability benefits for existing customers once the facility is fully ramped.

Source: Michigan Public Service Commission

EMERGING MARKET TRENDS

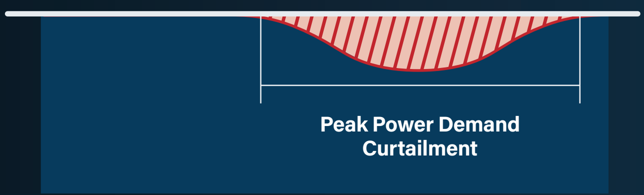
Energy Storage Powers Data Centers and Enables Maximum AI Compute Capacity

Energy storage can help America quickly deploy and power new data centers and win the AI race. By supporting baseload resources and directly adding grid capacity and flexibility, data centers can be added more quickly, at a lower cost, and without compromising compute capacity.

Energy Storage Can Maximize Data Center Compute While Minimizing Grid Impact and Peak Power Pricing

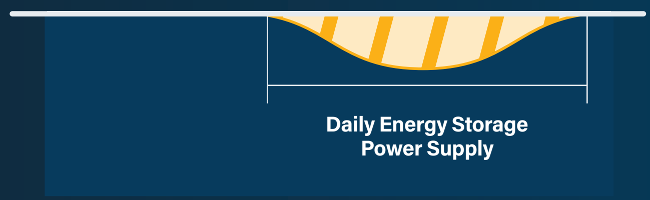
Data Centers

800 MW
Nameplate Capacity



Data center is curtailed for several hours each day or during peak demand events throughout the year, choosing between limiting operational capacity and adding strain on the power grid.

Data Centers + Energy Storage

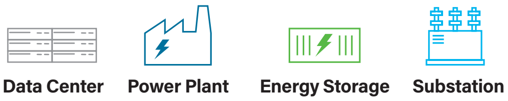


Energy storage delivers power at peak times for several hours each day or during peak demand events, allowing data centers to continue normal operations and power consumption with mitigated grid impacts.

How Energy Storage Can Support Data Centers and Accelerate America's Leadership in the Artificial Intelligence Race

1. Making data centers flexible without compromising compute capacity and operations, preventing curtailment and reducing a data center's power use during peak demand.
2. Rapidly ramping grid capacity to accommodate new data centers and industrial facilities because energy storage resources can be deployed quickly — sometimes in a matter of months.
3. Lowering energy costs for data centers and consumers by stretching the megawatts produced by baseload resources during times of peak demand and reducing largescale grid or transmission upgrades in the near-term.
4. Providing backup power, uninterruptible power supply (UPS) services, and power stability for large loads that ensures consistent power to data centers and minimal impact on the broader grid.

Energy Storage Can Be Co-Located or Sited to Address Weak Points in the Grid



XAI COLOSSUS DATA CENTER

At the xAI supercomputing facility in Memphis, large-scale battery storage is paired with on-site fuel generation to ensure around-the-clock reliability. The site combines mobile gas turbines with Tesla Megapack batteries that store excess energy and discharge instantly when power demand spikes. Pairing energy storage with traditional power assets can enhance reliability, cut operational costs, and extend the useful life of existing generation — all while enabling maximum data center compute.

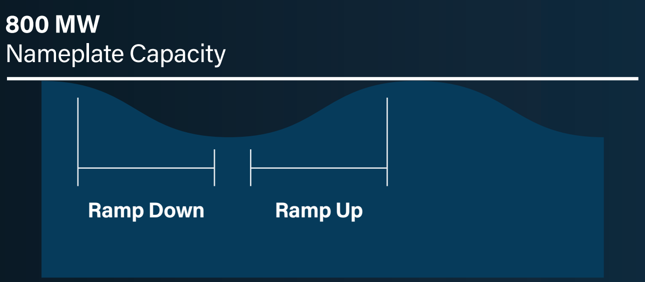
Energy Storage and Power Plants

Energy Storage Supports and Enhances America's Power Plants

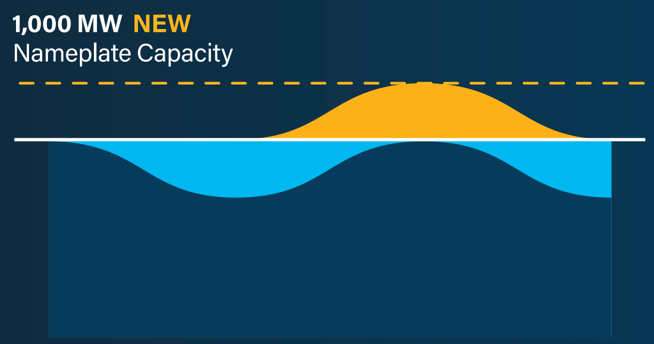
Energy storage helps America's power plants run stronger and steadier by storing power when demand is low and delivering it instantly when demand spikes. That means plants operate more efficiently, avoid costly ramp-ups, and stay ready to meet the nation's power needs 24/7. Pairing storage with traditional thermal generation strengthens the grid, protects consumers from blackouts, and keeps reliable, American-made energy on the system.

Energy Storage Can Maximize Power Plant Production

Power Plants



Power Plants + Energy Storage



- **Power plants generate electricity** and ramp production up and down depending on fluctuations in demand for power. Power plants are often not operating at full capacity 24 hours each day, and the ramping can lead to wasted energy, wear and tear that leads to more maintenance, and a shorter lifespan for large power plants.
- **Energy storage charges** when there is excess power and power plants are signaled to ramp.
- **Energy storage provides power** during peak demand to boost capacity and maximize use of otherwise wasted energy.

Storage can help power plants run consistently at maximum production

How Energy Storage Complements America's Power Plants

1. Amplifying power production from baseload resources during peak demand, extending the capacity of power plants.
2. Instantly dispatching and responding to grid needs in milliseconds to manage demand fluctuations, while baseload resources provide more and more consistent power.
3. Smoothing operations by reducing cycling and wear and tear, covering for baseload resources during shoulder season maintenance, and extending the lifespans of baseload power resources.
4. Addressing critical grid bottlenecks and accelerating new baseload resource additions by quickly enhancing transmission networks.

Energy Storage Increasingly Co-Located to Boost Efficiency and Reliability of Thermal Power Plants

Energy storage has proven its value as a fuel-agnostic force multiplier for different types of power generation resources. An emerging trend in the industry includes a diversification of generation resources with which energy storage is paired or co-built to maximize capacity, reliability, and affordability values.

Photo Credit: U.S. Department of Energy

GEORGIA POWER'S PLANT BOWEN

Georgia Power's Plant Bowen, outside Euharlee, Georgia, demonstrates how energy storage can be integrated with existing power plants to maximize the value of established grid infrastructure while meeting rapidly growing electricity demand. Georgia Power is adding a 500 MW/2,000 MWh battery storage system alongside nearly 1,500 MW of new combined-cycle natural gas generation at the existing coal-fired Plant Bowen site. The battery will use existing transmission infrastructure to provide fast, flexible capacity that complements the plant's thermal generation — storing electricity when it is abundant and dispatching it during periods of highest system need. The project illustrates an emerging model for pairing storage with existing and new baseload generation to make power plants more flexible, increase utilization of existing grid connections, and add dependable capacity faster and more efficiently.

Photo Credit: U.S. Department of Energy

PADUCAH AMERICAN ENERGY HUB

The Paducah American Energy Hub in Kentucky demonstrates how battery storage can help bring enormous new industrial loads online while protecting the broader grid and existing ratepayers. The $100 billion development will pair a 1.8 GW AI and high-performance computing campus with 2 GW of new natural-gas generation, transmission upgrades, and up to 2.6 GW of battery energy storage — making batteries one of the largest components of the project's dedicated power infrastructure. Storage will provide flexible capacity to help balance the campus's intensive power demand, strengthen regional grid reliability, and enable the overall energy complex to produce more capacity than the campus requires. That excess power can flow back to the regional grid, which the U.S. Department of Energy says will help lower electricity costs for surrounding families and businesses, illustrating how storage can help transform massive new electricity demand from a potential grid burden into an asset for the broader power system.


Photo Credit: Eolian

EOLIAN'S PADUA ENERGY STORAGE COMPLEX

The three-phase energy storage complex in San Antonio, Texas, will provide 400 MW/1.8 GWh of instant support to a natural gas facility and extend the life of a decades-old coal facility. The first phase, already in operation, will be joined by the next phases in 2026, ahead of thermal outage season and at a critical grid location for Texas' south-to-north transmission flow. Developed by Eolian using equipment supplied by Tesla and working with local utility CPS Energy, the complex's battery storage projects range from two to five hours in duration and will provide new capacity and complement baseload generation.

Long-Duration and Multi-Day Energy Storage

The recent acceleration in long-duration and multi-day energy storage (LDES and MDS) commercial offtake agreements and project development reflects a convergence of changing grid needs, improving project economics, advancements in technology commercialization, and broader understanding of the different applications and use cases for longer-duration energy storage resources.

Layered Flexibility by Pairing Short- and Long-Duration Technologies

Rapid load growth is increasing the value of dependable capacity that can be brought online quickly. While the continued buildout of shorter-duration energy storage, primarily lithium-iron-phosphate batteries, remains critical to maintaining grid reliability and increasing intraday flexibility and efficiency, LDES and MDS technologies are emerging as a new option for extended capacity and reliability.

These technologies represent an entirely different class of energy resources, providing output across longer peaks, overnight periods, and multi-day grid stress events. At the same time, large energy users and utilities are increasingly signing long-term contracts for the services of these resources to provide the necessary revenue certainty to finance technologies that are new to the power grid.

As these technologies scale, manufacturing ramps, and more utilities gain operating experience, longer-duration storage is moving from demonstration projects toward a resource procured and deployed at scale for its economic and reliability value — filling the increasingly valuable hours that short-duration energy storage resources were not designed to serve.

FORM ENERGY'S LINCOLN TECHNOLOGY PARK

The project is part of Power Up New England — a partnership across the six New England states, major utilities, Form Energy, and the U.S. Department of Energy (DOE). The goal: a more resilient, reliable grid — and lower electricity costs for New England families and businesses.

Using iron-air batteries made in America at Form Factory 1 in West Virginia, the system is expected to store enough energy to reliably power around 65,000 Maine households, reducing the need for transmission upgrades and easing strain during the highest-cost hours on the grid.

GOOGLE-XCEL ENERGY CAMPUS

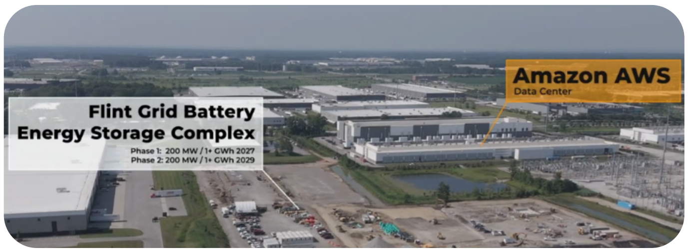
The Xcel Energy–Google energy campus in Minnesota demonstrates how different storage durations can work together to serve major new electricity demand. The project pairs a 300 MW/30 GWh, 100-hour Form Energy iron-air battery, which represents the largest announced project by energy capacity globally, with short-duration distributed battery systems.

The approach illustrates the complementary value of different storage durations: shorter-duration batteries can respond rapidly to daily peaks and local grid constraints, while the 100-hour system can shift very large quantities of energy across days and provide firm capacity through prolonged periods of high demand or low generation.

Expanding Use Cases for Five to 10 Hour Energy Storage Facilities

The battery market is beginning to move beyond the four-hour standard as the problems storage is being asked to solve become longer and more complex. In California, longer-duration batteries can extend abundant daytime power through a longer evening peak. In Texas, they can manage extended price volatility, congestion, and periods of system tightness.

In the emerging Midwest markets such as Ohio and Illinois, long-duration batteries can help serve rapidly growing demand while transmission and generation infrastructure catches up. The common economic proposition is straightforward: As grid constraints persist across more hours, the value of a battery that can move larger quantities of electricity across time increases — creating a growing market for five-, six-, eight- and 10-hour storage.



EOLIAN'S FLINT GRID BESS

Eolian's Flint Grid complex is the largest battery storage resource to be constructed to date in Ohio and the PJM electricity market. Flint Grid's first phase is a 200 MW/5.3-hour BESS project that will provide more than 1 GWh of electricity storage capacity and can respond to grid fluctuations in less than a second. Now under construction, Now under construction, Flint Grid is strategically located at a major substation in the heart of a data center and industrial cluster. The project is designed to make better use of the existing electric grid while providing a local reliabilty resource. By serving critical data center load without requiring new transmission lines, Flint Grid can help meet growing electricity demand while lowering costs for consumers.

REV RENEWABLES TUMBLEWEED FACILITY

The Tumbleweed Energy Storage project in Kern County, California, illustrates the state's transition toward longer-duration batteries as the grid needs extend beyond the traditional four-hour window. The project expanded from 125 MW/500 MWh to 125 MW/1,000 MWh, doubling its discharge duration from four to eight hours without adding power capacity.

That additional duration allows Tumbleweed to capture abundant daytime electricity and carry it through the evening peak and further into nighttime hours, reducing energy waste and providing dependable capacity across a longer period of system need. As California's first eight-hour battery developed through the state's Integrated Resource Planning process, Tumbleweed demonstrates how extending battery duration can increase the value of the same grid connection — providing more energy, for more hours, from existing infrastructure.

Powering Industrial and Defense Infrastructure with Energy Storage

There have been recent innovative applications of energy storage to support critical infrastructure, including behind-the-meter structures to support direct power supply for industrial and defense infrastructure. For large industrial facilities, energy storage can turn abundant, low-cost electricity into dependable, around-the-clock energy, reducing operating costs, and enabling facilities to expand without relying solely on new generation or grid infrastructure.

ANTORA ENERGY SERVING INDUSTRIAL BIOFUELS

Project Big Stone is a 5 GWh, multi-day thermal energy storage system based in a biofuels facility in Big Stone City, South Dakota. It uses over 200 thermal batteries to convert surplus energy into heat and steam, providing round-the-clock industrial power.

EOS ENERGY POWERING U.S. GOLDEN DOME

Energy storage is increasingly being deployed to support U.S. defense and national security infrastructure, providing resilient, rapidly dispatchable power for critical facilities. Eos Energy's selection to provide long-duration storage for the U.S. federal government's Golden Dome initiative illustrates the expanding role of energy storage in strengthening energy security and mission readiness.

Energy Storage Manufacturing: A New American Industrial Juggernaut

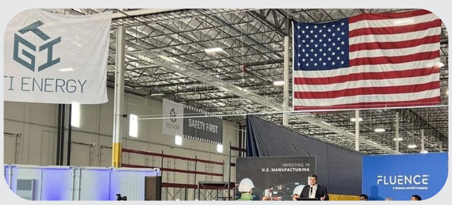
In 2025, energy storage emerged as the leading driver and industrial anchor of battery supply chain investments for the first time. This momentum follows the industry's 2025 commitment to invest $100 billion in American manufacturing and minerals production, generating over 350,000 new jobs.

Energy storage now represents one of the fastest-growing advanced manufacturing sectors in the U.S. economy — serving as an engine of economic growth and prosperity. This rapidly growing domestic manufacturing capacity will fuel broader deployment of energy storage resources proven to generate significant energy cost savings, helping keep electricity affordable for American families and businesses.

AMERICAN ENERGY STORAGE MANUFACTURING IN 2030

150 GWh	$100B+	350,000+
Energy Storage Supply Chain Capacity in the United States	Invested in American Factories' Grid Battery Production	American Jobs Created

Systems Manufacturing: Engineered Enclosures, Power Electronics, and Smart Equipment



FLUENCE

Fluence is scaling American-made energy storage with domestically produced battery cells, modules, enclosures, thermal management systems, and other equipment from a growing network of manufacturing partners across Utah, Arizona, Texas, Michigan, Georgia, South Carolina, and Tennessee.

TESLA

In addition to Tesla's operating 40 GWh Megapack factory in Lathrop, California, the company also recently began ramping commercial operations at a new 50 GWh manufacturing facility outside of Houston, Texas.

LG ENERGY SOLUTION

LG Energy Solution assembles U.S.-made cells into full energy storage systems at a final assembly facility in Phoenix, Arizona. Production is set to expand in 2026 to support LG Energy Solution's estimated 50 GWh of North American ESS manufacturing.

Battery Cell Manufacturing: The Engine of BESS

LG ENERGY SOLUTION

LG Energy Solution will produce ESS cells at four different U.S. plants, including its facility in Holland, Michigan, which has already started producing ESS LFP cells. The company's production capacity for ESS cells in North America will be further expanded and reach around 50 GWh in 2026.

SAMSUNG SDI

Samsung SDI is ramping up LFP ESS battery production at its Kokomo, Indiana joint venture facility and is further expanding production of ESS cells through its solely-owned 2.5 million square foot facility currently under construction in New Carlisle, Indiana.

FORD ENERGY

The company is leveraging a 4-million-square-foot facility in Glendale, Kentucky, and investing $2 billion to advance production capacity of 20 GWh a year in battery energy storage, including American-made grid battery cells.

The Pathway Forward: Policy Influencing the Outlook

Certainty and Stability are Essential to Achieve 1 Terawatt-hour of Energy Storage

Energy storage has entered a period of rapid commercial scale-up, but the industry's long-term trajectory — and the economic benefits captured by ratepayers — will depend significantly on the policy environment surrounding deployment, domestic manufacturing, and market access. The central policy question for the next decade is whether policy and regulatory frameworks allow the industry to build, connect, manufacture, and operate at the speed and scale demanded by the U.S. power system.

Policies that could accelerate energy storage deployment:

1. **Tax and Regulatory Certainty:** The durability and workability of federal tax incentives will remain important to both deployment and manufacturing. Additional guidance and regulatory clarification could provide additional confidence for pending investments.
2. **Access to Electricity Markets:** Storage's ability to scale will increasingly depend on whether grid rules recognize its unique flexibility and broad applications. Improved capacity accreditation, appropriate participation models, and reforms that eliminate penalties and barriers to storage participation in emerging markets could unlock substantial additional deployment.
3. **Streamlined Permitting and Interconnection:** As deployment expands into more communities, state and local permitting could become one of the industry's most consequential bottlenecks. Broad adoption of nationally recognized standards and evidence-based state permitting rules and local ordinances, along with expedited interconnection processes that harness the speed to power advantage of energy storage, will be important factors in the long-term deployment outlook.
4. **Expanded U.S. Manufacturing & Upstream Production:** Expanding domestic production of upstream battery materials and components may become an increasingly important constraint, making the future of 45X — and potentially its expansion deeper into the supply chain — a major determinant of U.S. manufacturing competitiveness.

Pace of Electricity Demand Growth is a Significant Factor

The pace and magnitude of U.S. electricity demand growth remains one of the largest uncertainties affecting the long-term energy storage outlook. Forecasts vary considerably based on assumptions around data center development, industrial expansion, electrification, and broader economic growth. Higher-than-expected demand growth could materially accelerate the timing and scale of storage additions, while slower growth could moderate deployment relative to current projections. As a result, different load-growth assumptions produce meaningfully different energy storage deployment trajectories through 2035.

Photo credit: Recurrent Energy

Power Modeling Methodology

Assessing a Base Case of Energy Storage Deployment vs. Alternative Scenarios

The power-system model identifies the lowest-cost portfolio of generation, energy storage, and other grid resources capable of reliably meeting electricity demand. It compares the costs of building and operating different resource combinations while imposing reliability and operational requirements, including the need to serve load and maintain adequate capacity and reserves. The result is a least-cost system in which reliability is a constraint, not a tradeoff.

The analysis compares two scenarios for the U.S. power system over the next decade: a Base Case, in which energy storage is allowed to deploy at the level the model determines is economically optimal to meet a high load growth scenario, and a constrained-storage scenario, in which new energy storage deployment is severely limited.

In both scenarios, the model solves for the lowest-cost mix of resources capable of meeting projected electricity demand while maintaining the same reliability requirements. This type of capacity-expansion modeling evaluates investment and operating decisions together, allowing the system to select among generation, storage, transmission, and other resources based on their costs and system value.

By holding reliability requirements constant and changing the amount of energy storage available to the system, the analysis isolates the economic value that storage provides. The difference in total system cost between the two scenarios represents the savings enabled by energy storage. The analysis finds that the system with the economically optimal buildout of storage is substantially less expensive than the system in which storage deployment is constrained.

Capacity expansion models largely simulate a full year of using a limited set of representative days or time-slices rather than modeling all 8,760 hours. Modeling a full chronological time series is computationally expensive and time-consuming, especially over large areas (e.g., the entire Eastern Interconnection). As a result, most capacity expansion models either keep to smaller utility-level areas to model all 8,760 hours, or model entire regions but slice them into 20-100 buckets of hours. The former may properly value long-duration storage but is impractical to stitch together into a full representation of a large, interconnected grid. The latter works reasonably well for short-duration storage, whose value stems from predictable daily price patterns, but it tends to miss the value of long-duration storage. Because it models time in buckets, it tends to smooth over or omit multi-day weather events and seasonal supply gaps. As a result, these models can significantly underestimate the reliability and economic value that long-duration storage provides during infrequent but high-impact periods of system stress.

It is also worth noting that energy storage provides value beyond its role in integrating intermittent resources. It can supply capacity during peak demand periods, provide fast-responding grid services such as frequency regulation, defer costly transmission and distribution upgrades, and enhance system resilience during outages. Current capacity expansion models, however, are not able to fully capture all of these benefits at once, largely a result of computational constraints. So while this model estimates the scale of potential economic benefits of energy storage, existing models may be conservatively estimating the full value proposition of energy storage.

The U.S. Energy Storage Coalition unites America's leading grid battery manufacturers, energy storage developers, owners, and operators. The Coalition advances policies and solutions to ensure grid reliability amidst historic demand for power, lower energy costs for all Americans, strengthen grid capacity to support new industrial and AI infrastructure, and rapidly scale American manufacturing and minerals production.

Learn more at EnergyStorage.org.

ENERGY STORAGE COALITION