

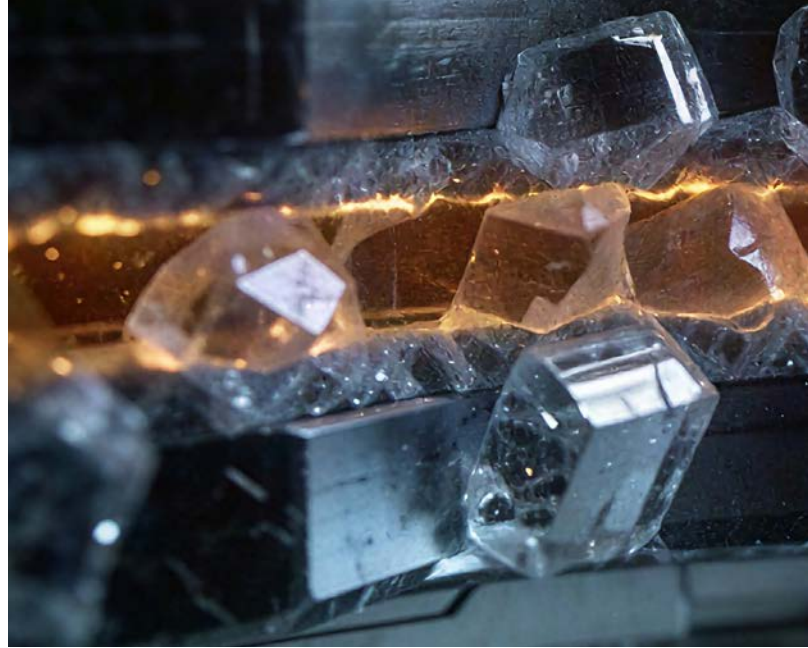


U.S. DEPARTMENT
of **ENERGY**

A National Strategy for American Leadership in Batteries

Battery technology is increasingly critical to the United States (U.S.) economy and national security. Fast-growing battery technologies are essential for a resilient national electric grid, the transportation sector, and a wide range of other applications (e.g., consumer electronics, drones). As deployment accelerates, U.S. demand for batteries is projected to quadruple across all transport and energy-storage applications, increasing from 179 gigawatt-hours (GWh) in 2025 to 707 GWh in 2035.¹

Batteries are a foundational technology for high-performance mobility systems, and support both consumer technologies and mission-critical national security systems. As super intelligence (SI) drives rapid growth in electricity demand, batteries can provide grid reliability by enabling load shifting and dispatchability. Data centers alone are projected to account for 25 percent of U.S. battery storage demand by 2030.² U.S. utilities are increasingly reliant on battery energy storage systems (BESS) to prevent operational



disruptions from the unprecedented challenges of large data center loads on their grids (e.g., sudden computer-driven drop off). Batteries are enabling the technology behind the world's most critical sectors—including electronics, transportation, advanced defense systems, robotics, and grid infrastructure. Ensuring U.S. leadership in battery innovation and manufacturing while building secure and resilient battery supply chains is a vital national interest.

The U.S. has historically been the world's incubator for advanced battery technology, including the Nobel Prize in Chemistry for the development of the lithium-ion battery. However, this innovation base has not resulted in an end-to-end domestic supply chain. Recent investment in downstream cell and pack manufacturing has occurred but U.S. capacity in midstream components remains underinvested, which has resulted in a discontinuous domestic supply chain (Figure 1). China dominates those segments and poses substantial supply chain risk.

1. *Battery Demand Outlook, Base Scenario*, Bloomberg NEF (Jun. 2026), <https://bnef.com/>.

2. *BESS - Stabilising the Grid in the Age of AI and Data Centers*, Benchmark Mineral Intelligence (Jun. 2026), <https://source.benchmarkminerals.com/publications/presentations/bess-stabilising-the-grid-in-the-age-of-ai-and-data-centers>.

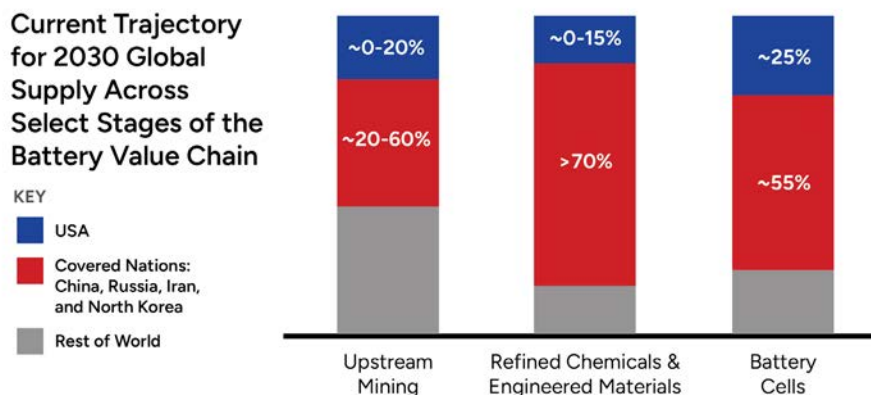


Figure 1. Illustrative overview of global supply base case by region for 2030. Not all battery supply chain nodes are included. Select supply nodes included in these ranges are: upstream (mined lithium, nickel, fluorine, manganese), refined chemicals (precursor cathode active materials, lithium, phosphorus, needle coke, manganese, electrolyte salt and solvent) and downstream (nickel-rich battery cell capacity shown here). Here geographic assignment includes consideration of both facility ownership and headquarter location.³

Due to the low profit margins and massive scale required to compete in a commodity-driven market, on-shoring the midstream (cathodes, anodes, electrolytes, and separators) is uniquely difficult. China alone controls 60 to 100 percent of global production capacity across several midstream and cell sub-component stages.⁴ This global reliance limits the nation's ability to control critical supply chains and undermines American industrial independence.

The Department of Energy's (DOE) Strategic Vision

DOE is addressing these challenges by executing a comprehensive, three-pronged strategy to drive U.S. leadership across battery innovation, manufacturing, and utilization.

OBJECTIVE 1: Mine-to-Market: Establish a Continuous Domestic Value Chain by 2030.

DOE is prioritizing investments to shift from a discontinuous, import-reliant supply chain to an integrated domestic production system through the upstream (mining), midstream (refining and engineered materials), and downstream (cells, packs, and end products). The Department will enable domestic offtake of extracted resources, sub-components, and capital equipment while fostering the infrastructure to retain and advance next generation technologies.

OBJECTIVE 2: Discovery-to-Deployment: Achieve Technology and Manufacturing Leadership by 2035.

The U.S. must discover, develop, and commercialize next-generation, fit-for-purpose batteries. These batteries should be more affordable, longer lasting, higher performing, and less reliant on critical minerals in select market segments. DOE is a leader in fundamental battery research and will further strengthen the translation

3. DOE analysis based on *Raw Material, Active Material, and Battery & Gigafactory Forecasts for Supply, Demand, and Price, Q1 & Q2 2026*, Benchmark Mineral Intelligence (Mar. 2026), <https://www.benchmarkminerals.com/>.

4. DOE analysis based on *Battery Component Manufacturing Assets*, Bloomberg NEF (Mar. 2026), <https://bnef.com/>.

of this science to important battery technology needs.

Future leadership in next-generation batteries will leverage DOE research investments that balance fundamental research and innovation with application-specific engineering targets for cost and performance, prioritizing funding for real-world piloting, and performance testing, while enabling commercial deployment of cost-effective new chemistries, architectures, and manufacturing processes.

OBJECTIVE 3: Enable affordable, safe, and reliable storage applications for the American public.

DOE will promote the deployment of advanced battery systems to meet rapidly growing energy demand from SI data centers, transportation, defense, etc. Battery-containing products offer many advantages as long as they are affordable, safe, and reliable. Battery technologies can, for example, strengthen grid resilience against extreme weather and disruption. DOE will support a portfolio of storage solutions, including fast-responding grid services and long-duration assets, to enhance reliability, add flexible capacity that is faster than traditional infrastructure, and ensure all systems are cybersecure.

DOE will achieve this vision through six strategic pillars.



1. Target investments in the upstream and midstream supply chain steps.

Federal incentives have successfully spurred downstream cell and pack assembly, but building a self-sustaining domestic supply chain requires more domestic investments in extraction, refining, recycling, and equipment manufacturing.

The presence of domestic segments like precursor cathode, anode active materials (AAM), electrolyte salts, separators, and binders will enable customer offtake of U.S. natural resources and further upstream stages (e.g., upstream natural and synthetic graphite production offtake by midstream AAM facilities).



2. Accelerate commercial deployment of laboratory discoveries.

There is a longstanding Federal funding gap between mid-stage research and development and near-mature commercial manufacturing that has contributed to a persistent “valley of death” for new discoveries. This gap has hindered the translation of laboratory discoveries into commercial successes. DOE is prioritizing available funding for pilot, demonstration, and validation facilities to derisk innovative technologies and accelerate bankability. This new approach will complement traditional science-based “push” metrics (like publication counts) with measurements of market “pull” and impact. DOE is integrating manufacturability, scalability, and market potential into early-stage applied research by considering cost and repeatability to accelerate commercial-scale manufacturing and adoption. The use of autonomous laboratories and data generated through SI-mediated discovery science can also lower barriers to translation.



3. Prioritize manufacturing process innovation.

American leadership requires innovation both in what is made and how it is manufactured. A primary competitive gap is manufacturing efficiency and process engineering. DOE is prioritizing investments in next-generation technologies, such as continuous processing,

advanced SI tools for quality control, and digital twins to boost factory yields and make U.S. manufacturers globally competitive.



4. Mission-driven deployment for grid modernization.

DOE will target mission-driven battery deployment that aligns innovation with the nation's most critical grid needs, moving from technology development to field validation and systems integration. Priorities include the deployment of battery solutions—from fast-responding services to long-duration assets—that are purpose-built to enhance emerging grid needs, including resilience against extreme weather, support for load growth from SI and data centers, and ensuring affordability for consumers. Deployment will be supported by DOE's work towards establishing robust interoperability standards, embedding secure-by-design principles, and translating field data into performance gains.



5. Coordinated national strategy with international partners.

DOE will continue to support U.S.-aligned standards and practices that provide American manufacturers with access to global markets. DOE will coordinate strategic engagements with allied nations to leverage complementary strengths in natural resource availability, manufacturing expertise, and fundamental and applied research and development capabilities for mutual benefit. DOE also supports the multi-agency Federal Consortium for Advanced Batteries to drive a cohesive *National Blueprint for Advanced Batteries*.



6. Investing in American talent.

The American workforce is central to the success of this strategy, from the technicians who will mine and refine critical materials, to the engineers and tradespeople who will build and operate factories, and the researchers who develop new technologies. From high school, to trade school programs, to two and four-year degrees, to advanced PhD research, every educational level matters. DOE will continue to partner with industry and labor through programs like the Industrial Training and Assessment Center program to train the skilled workforce needed to build and run a holistic battery ecosystem.

Securing America's Battery Future

This strategy serves as a roadmap for our partners in government and a call to action for industry. Building American battery dominance requires a deliberate, active, and collaborative effort. Strategic investments will close supply chain gaps, strengthen research collaboration, and accelerate the commercialization of technology and manufacturing-process innovations. These efforts will enable the U.S. to build a secure, resilient, and globally competitive battery industry. Together, we will power the nation's future, safeguard the U.S. economy, and reclaim American leadership in these critical technologies. ■



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