

TROY TECHNICAL

NEXT-GENERATION ENERGY STORAGE WEEKLY REPORT

September 19 - September 25, 2026 | Issue 2026-W38

**Cell-level evidence, manufacturing yield,
safety and bankable supply**

10

ANALYZED ARTICLES

10

PRIORITY THEMES

Issued 2026-09-25 | English edition | fixed approved cover artwork



Next-Generation Energy Storage: the boundary moved from isolated claims to qualification evidence

10 English articles were reviewed independently from the Japanese edition. Ten themes are retained for management decisions.

SIGNAL 01 | ACTIVE MATERIALS

ORNL STAR Lab: Sulfide solid-state battery scalability specs

The Sulfide/Sulfur Translational Advanced Research Lab (STAR Lab) at Oak Ridge National Laboratory (ORNL) has launched research to validate the practical scale-up of next-generation battery technologies, specifically sulfide solid-state batteries and sulfur.

SIGNAL 02 | CELL DESIGN

Changan Automobile: First mass-produced CATL sodium-ion EV

Changan Automobile (China) is set to launch the world's first mass-produced sodium-ion electric vehicle this month, powered by CATL batteries.

SIGNAL 03 | MANUFACTURING

BYD: 10,000-cycle sodium battery and CATL 60 GWh supply deal

BYD announced on February 9, 2026, the development of high-performance sodium batteries achieving a cycle life of up to 10,000 cycles.

SIGNAL 04 | SYSTEM VALIDATION

Ampricus Technologies: 450 Wh/kg silicon anode cell EV timeline

Ampricus Technologies has begun commercial shipments of nearly pure silicon anode cells with an energy density of up to 450 Wh/kg for aerospace and light EV customers, marking a pivotal moment for EV battery technology.

DECISION

Focus this week's management attention on cell-level evidence, manufacturing yield, safety and bankable supply. Move only when the linked evidence can be reproduced under your own operating conditions.

THREE MANAGEMENT MOVES

1. Buyers: compare technologies under the same duty cycle, safety envelope and total system cost.
2. Suppliers: connect materials claims to electrode processing, yield, validation and secured capacity.
3. Executives: track cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EVIDENCE DISCIPLINE

FACT states what the collected English source reports. BUSINESS READ and ACTION are editorial interpretations. UNKNOWN lists information that the source file does not establish. A linked article is not treated as independent confirmation of every claim.

Five numbers or evidence anchors that require conditions

400 GW

A06

SOURCE-BOUND CONDITION

This move solidifies China's global leadership in sodium-ion battery production, with its planned capacity now exceeding 400 GWh, vastly surpassing the 11 GWh total of all other countries.

10,000 cycles

A08

SOURCE-BOUND CONDITION

BYD announced on February 9, 2026, the development of high-performance sodium batteries achieving a cycle life of up to 10,000 cycles.

450 W

A05

SOURCE-BOUND CONDITION

Ampricus Technologies has begun commercial shipments of nearly pure silicon anode cells with an energy density of up to 450 Wh/kg for aerospace and light EV customers, marking a pivotal moment for EV battery technology.

58%

A02

SOURCE-BOUND CONDITION

By introducing chlorine into the electrode, sulfur can participate in an additional third electron transfer reaction, boosting sulfur's charge capacity by approximately 58%.

30%

A10

SOURCE-BOUND CONDITION

Their refurbished systems are approximately 30% cheaper than new batteries and can extend service life by several decades.

HOW TO USE THESE NUMBERS

Each value is shown with the condition stated in the collected English article. Do not compare values across different test methods, device sizes, operating temperatures or commercial stages without normalizing those conditions.

Where the value chain moved

Each stage combines one leading theme and one supporting theme. The report treats handoffs as evidence transfers, not decorative arrows.

1

Active materials

P01/P06

The Sulfide/Sulfur Translational Advanced Research Lab (STAR Lab) at Oak Ridge National Laboratory (ORNL) has launched.

2

Cell design

P02/P07

Changan Automobile (China) is set to launch the world's first mass-produced sodium-ion electric vehicle this month, powered.

3

Manufacturing

P03/P08

BYD announced on February 9, 2026, the development of high-performance sodium batteries achieving a cycle life of up to.

4

System validation

P04/P09

Amprius Technologies has begun commercial shipments of nearly pure silicon anode cells with an energy density of up to 450.

5

Deployment & recycling

P05/P10

Researchers from Vanderbilt and Maryland Universities have unveiled a novel battery chemistry published in Nature Energy.

EVIDENCE REQUIRED AT EACH HANDOFF

Active materials to Cell design	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.
Cell design to Manufacturing	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.
Manufacturing to System validation	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.
System validation to Deployment & recycling	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

COMMON CONTROL POINT
No theme moves to a commercial commitment until a named owner has reproduced the relevant evidence and documented cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

Priority map: maturity and next decision locus



REPRODUCIBLE POSITIONING RULE

Horizontal position uses five discrete stages: Research, Prototype, Joint evaluation, Product adoption and Scale. The vertical bands classify the next decision locus: Tech / process, System / adoption, or Business / rules (including supply systems). Article-title cues take precedence; the overview is used only when the title is silent. These are categories, not impact ranks. Bubble diameter reflects the editorial score.

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P01

ORNL STAR Lab: Sulfide solid-state battery scalability specs

A01 | Active materials | Product adoption

Date not stated

FACT

The Sulfide/Sulfur Translational Advanced Research Lab (STAR Lab) at Oak Ridge National Laboratory (ORNL) has launched research to validate the practical scale-up of next-generation battery technologies, specifically sulfide solid-state batteries and sulfur electrodes with high energy density potential.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P01.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 21/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

P02

Changan Automobile: First mass-produced CATL sodium-ion EV

A06 | Cell design | Product adoption

Date not stated

FACT

Changan Automobile (China) is set to launch the world's first mass-produced sodium-ion electric vehicle this month, powered by CATL batteries. This move solidifies China's global leadership in sodium-ion battery production, with its planned capacity now exceeding 400 GWh, vastly surpassing the 11 GWh total of all other countries.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P02.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 21/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P03

BYD: 10,000-cycle sodium battery and CATL 60 GWh supply deal

A08 | Manufacturing | Product adoption

Date not stated

FACT

BYD announced on February 9, 2026, the development of high-performance sodium batteries achieving a cycle life of up to 10,000 cycles. Concurrently, CATL revealed on May 9, 2026, plans to invest \$735 million USD to expand its sodium battery production capacity by 40 GWh in Fujian province. Furthermore, on April 28, 2026, CATL and HyperStrong inked the world's largest sodium-ion energy storage cooperation agreement, underscoring both companies' aggressive push towards sodium-ion battery commercialization.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P03.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 21/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

P04

Amprius Technologies: 450 Wh/kg silicon anode cell EV timeline

A05 | System validation | Research

Date not stated

FACT

Amprius Technologies has begun commercial shipments of nearly pure silicon anode cells with an energy density of up to 450 Wh/kg for aerospace and light EV customers, marking a pivotal moment for EV battery technology. This achievement, coupled with Group14 and Sionix Energy's December 2024 announcement of composite cells reaching 330 Wh/kg and enduring 1,200 cycles, confirms that high-performance silicon anodes are no longer a theoretical concept.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P04.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 20/25 | MATURITY 1/5 | DECISION LOCUS: SYSTEM / ADOPTION

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P05

Vanderbilt University: Li-S battery 1700 Wh/kg capacity specs

A02 | Deployment & recycling | Product adoption

Date not stated

FACT

Researchers from Vanderbilt and Maryland Universities have unveiled a novel battery chemistry published in Nature Energy, significantly enhancing lithium-sulfur (Li-S) battery energy storage capabilities. By introducing chlorine into the electrode, sulfur can participate in an additional third electron transfer reaction, boosting sulfur's charge capacity by approximately 58%.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P05.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 20/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

P06

Battwoo: Repurposing EV batteries for 30% solar storage cost

A10 | Active materials | Product adoption

Date not stated

FACT

French startup Battwoo is repurposing used electric vehicle (EV) batteries into stationary energy storage systems for solar self-consumption and commercial/industrial applications. Their refurbished systems are approximately 30% cheaper than new batteries and can extend service life by several decades. This initiative ensures that 70-80% of EV batteries, still retaining significant capacity after their initial lifespan, are reused rather than recycled, combining resource efficiency with cost savings.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P06.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 20/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P07

Hithium: Specs for 20,000-cycle sodium-ion cell and 4MWh BESS

A07 | Cell design | Research

Date not stated

FACT

Hithium has introduced a pioneering sodium-ion cell achieving an industry-leading 20,000-cycle lifespan, along with a 4MWh Battery Energy Storage System (BESS) integrating this technology. This breakthrough is attributed to novel hard carbon anode materials with high-speed sodium-ion transport channels and a specialized electrolyte leveraging micro-bonding and targeted repair mechanisms.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P07.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 20/25 | MATURITY 1/5 | DECISION LOCUS: SYSTEM / ADOPTION

P08

AM Batteries: \$50M US DOE dry electrode manufacturing roadmap

A03 | Manufacturing | Product adoption

Date not stated

FACT

AM Batteries has been selected as a key sub-awardee in a \$50 million US Department of Energy (DOE) project led by Coreshell Technologies, focusing on scaling domestic battery manufacturing using its dry electrode (DBE) technology. The initiative aims to establish approximately 2 GWh of electrode manufacturing and 1.5 GWh of cell assembly capacity in the US.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P08.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 20/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P09

Mitsubishi Motors: EV second-life battery project for Australia

A09 | System validation | Joint evaluation

Date not stated

FACT

Flinders University in South Australia, in partnership with Mitsubishi Motors Australia and ResourceCo, is developing a commercially viable pathway to repurpose used EV batteries for stationary energy storage in homes, farms, and remote communities. This project aims to establish scalable utilization of second-life EV batteries by developing automated manufacturing processes integrated with battery management systems, demonstrating real-world prototypes.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P09.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 20/25 | MATURITY 3/5 | DECISION LOCUS: SYSTEM / ADOPTION

P10

KRICT: g-C3N4 dry electrode mobility and wettability explained

A04 | Deployment & recycling | Product adoption

Date not stated

FACT

Researchers at the Korea Research Institute of Chemical Technology (KRICT) have developed a groundbreaking technique to simultaneously boost electrolyte wettability and lithium-ion mobility by merely adding 0.5% graphitic carbon nitride (g-C3N4) to electrodes. This innovation addresses critical challenges in dry electrode manufacturing, improving performance for high-energy density electric vehicle (EV) batteries.

WHY IT MATTERS

The decision relevance is cell-level evidence, manufacturing yield, safety and bankable supply. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, connect materials claims to electrode processing, yield, validation and secured capacity.

ACTION

Within 30 days, compare technologies under the same duty cycle, safety envelope and total system cost; record the evidence and owner against P10.

UNKNOWN

Still unproven or incompletely stated: cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.

EDITORIAL SCORE 19/25 | MATURITY 4/5 | DECISION LOCUS: SYSTEM / ADOPTION

Playbook and 0-5 year roadmap

STAKEHOLDER	NOW 0-30 DAYS	NEXT 1-12 MONTHS	LATER 1-5 YEARS
Operating companies	compare technologies under the same duty cycle, safety envelope and total system cost	Run production-like qualification with explicit acceptance and stop criteria.	Build a portfolio and architecture that can absorb technology and supplier changes.
Materials, equipment and technology suppliers	connect materials claims to electrode processing, yield, validation and secured capacity	Create shared reliability, process-window and failure-analysis data with customers.	Standardize interfaces, traceability, lifecycle support and recovery services.
Trading, investment and legal teams	Map cycle life, fast charge, safety abuse, yield, cost, sourcing and warranty.	Contract for capacity, quality, change notice, liability, alternatives and exit.	Diversify regional, technical and customer concentration risk.

ROADMAP

NOW 0-30 DAYS Evidence ledger Owner: Strategy + quality Deliverable: claim, source, condition, owner	NOW 0-30 DAYS Risk screen Owner: Procurement + legal Deliverable: unknowns, alternatives, stop	NEXT 1-12 MONTHS Joint qualification Owner: R&D + supplier Deliverable: process window and failure data
NEXT 1-12 MONTHS Commercial gate Owner: Business + finance Deliverable: unit economics and capacity	LATER 1-5 YEARS Platform strategy Owner: Executive team Deliverable: portfolio and interface roadmap	LATER 1-5 YEARS Service layer Owner: Operations + channel Deliverable: monitoring, maintenance and recovery

GO / NO-GO GATES

GATE	OWNER	REQUIRED EVIDENCE	NO-GO CONDITION
G1 Evidence	Quality	Source, test conditions and reproducibility	No traceable evidence
G2 Integration	R&D	Interface, process window and failure analysis	Cannot meet system conditions
G3 Commercial	Business	Capacity, total cost, contract and alternatives	Economics or supply cannot be supported
G4 Lifecycle	Operations	Monitoring, maintenance, change notice and exit	No accountable operating plan

ANALYZED ARTICLES | ITEMS 01-10

Every title and URL is displayed in full. URLs wrap without shortening and remain clickable. A verified-reference label means the translated HTML did not retain its original source URL.

ID	FULL ARTICLE TITLE	FULL SOURCE / VERIFIED REFERENCE URL - CLICKABLE
A01	ORNL STAR Lab: Sulfide solid-state battery scalability specs	https://www.ornl.gov/news/star-lab-tests-whether-battery-advances-can-scale
A02	Vanderbilt University: Li-S battery 1700 Wh/kg capacity specs	https://engineering.vanderbilt.edu/2026/09/22/new-battery-chemistry-could-help-lithium-sulfur-batteries-store-more-energy/
A03	AM Batteries: \$50M US DOE dry electrode manufacturing roadmap	https://batteriesnews.com/am-batteries-partnered-on-50-million-us-department-of-energy-award-to-scale-domestic-battery-manufacturing-with-dry-coating-technology/
A04	KRICT: g-C3N4 dry electrode mobility and wettability explained	https://en.news1.kr/economy/6287316
A05	Amprius Technologies: 450 Wh/kg silicon anode cell EV timeline	https://discoveryalert.com/education/silicon-anode-battery-ev-technology/
A06	Changan Automobile: First mass-produced CATL sodium-ion EV	https://africa.businessinsider.com/local/markets/china-emerges-as-the-worlds-sodium-battery-powerhouse-ahead-of-us-france-as-africa/ce13t07
A07	Hithium: Specs for 20,000-cycle sodium-ion cell and 4MWh BESS	https://www.energy-storage.news/hithium-unveils-20000-cycle-sodium-ion-cell-and-4mwh-bess/
A08	BYD: 10,000-cycle sodium battery and CATL 60 GWh supply deal	https://globenergia.pl/mialy-byc-tanie-trwale-i-odporne-na-mroz-sprawdzamy-co-zostalo-z-obietnic-baterii-sodowych/
A09	Mitsubishi Motors: EV second-life battery project for Australia	https://thedriven.io/2026/09/24/australian-researchers-seek-pathway-to-ensure-ev-batteries-get-a-second-life-supporting-the-grid/
A10	Battwoo: Repurposing EV batteries for 30% solar storage cost	https://www.pv-magazine.com/2026/09/21/french-startup-repurposes-ev-batteries-for-solar-energy-storage/

NextGenEnergyStorage — Selected Articles

Date: 2026-09-27

Articles: 10

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#01 ORNL STAR Lab: Sulfide solid-state battery scalability specs

Published September 18, 2026 Oak Ridge National Laboratory (ORNL) USA



OVERVIEW

The Sulfide/Sulfur Translational Advanced Research Lab (STAR Lab) at Oak Ridge National Laboratory (ORNL) has launched research to validate the practical scale-up of next-generation battery technologies, specifically sulfide solid-state batteries and sulfur electrodes with high energy density potential. STAR Lab researchers are meticulously investigating how electrode formulations, binders, interfaces, cell designs, pressures, and testing conditions impact battery performance when these promising materials are integrated into real-world manufacturing processes. This initiative aims to bridge fundamental research with commercial production, accelerating market entry by overcoming existing challenges.

Key Findings

The Sulfide/Sulfur Translational Advanced Research Lab (STAR Lab) at Oak Ridge National Laboratory (ORNL) has embarked on a crucial initiative to validate the practical scalability of next-generation battery technologies. This research focuses on assessing whether promising battery materials, identified at the fundamental research stage, can maintain their performance when integrated into actual manufacturing processes and operational environments—a critical hurdle for commercialization.

Technical / Clinical Details

The primary focus of STAR Lab's research is on sulfide solid-state batteries and sulfur electrodes, both of which offer the potential for significantly higher energy densities compared to conventional lithium-ion batteries. Researchers are meticulously examining how various parameters—such as electrode composition (formulation), types and quantities of binders, characteristics of electrode-electrolyte interfaces, overall cell design, manufacturing pressures, and diverse testing conditions—influence battery performance when these advanced materials are incorporated into real manufacturing lines. This approach aims to glean vital insights into how laboratory-scale successes can be replicated and optimized in larger-scale production processes. Particular emphasis is placed on overcoming challenges related to interface stability, cycle life, and safety.

Background & Context

While current lithium-ion battery technology is maturing, there remains an urgent demand for even higher energy density and improved safety for applications such as extended-range electric vehicles (EVs), large-scale stationary energy storage, and high-power drones. Sulfide solid-state batteries, which eliminate flammable liquid electrolytes, offer inherent safety advantages, while sulfur electrodes boast exceptionally high theoretical energy densities, positioning them as leading candidates for next-generation batteries. However, these technologies still face challenges in terms of material stability, manufacturing complexity, and cost. Translational research, like that conducted at STAR Lab, is therefore essential to bridge the gap between lab breakthroughs and practical, market-ready products.

Strategic Significance & Outlook

The research at STAR Lab serves as a vital bridge for accelerating the commercialization of next-generation battery technologies. By identifying and resolving practical issues in the manufacturing process, the initiative aims to prove the adaptability of sulfide solid-state batteries and sulfur electrodes for large-scale production.

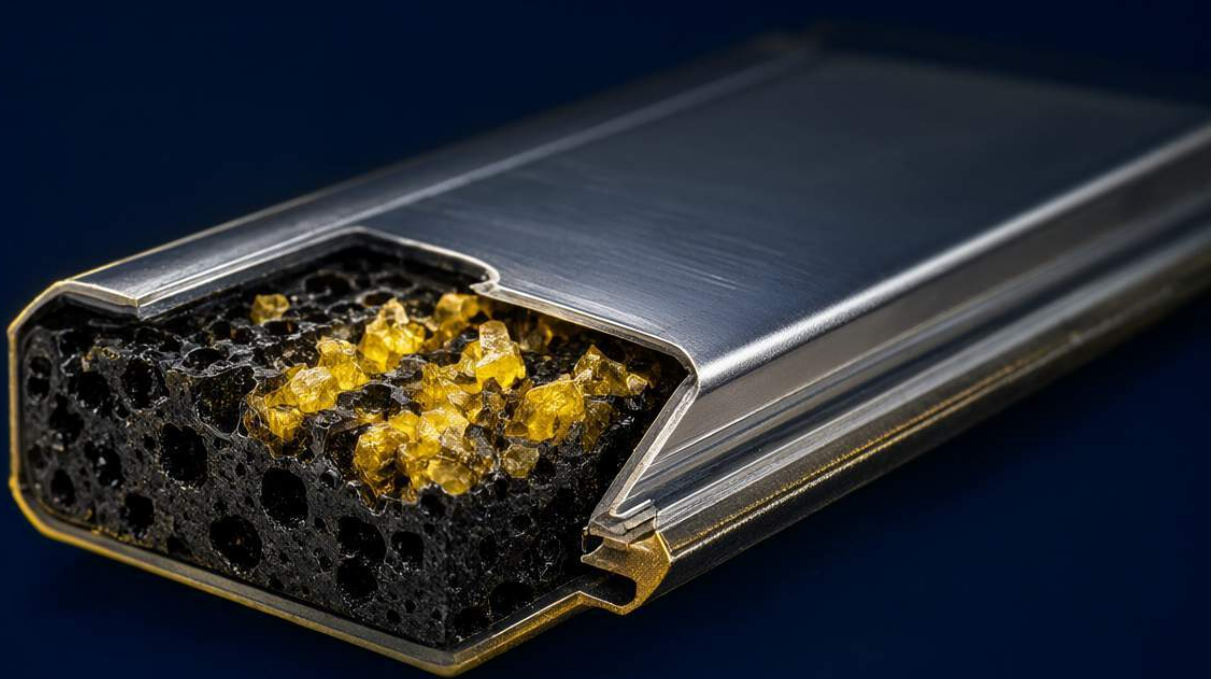
Successful outcomes from this endeavor could lead to the market introduction of safer, higher energy density batteries, revolutionizing electric vehicles, renewable energy storage, and various other power applications. This effort also contributes to strengthening domestic battery manufacturing capabilities in the US, thereby enhancing supply chain resilience.

Source: <https://www.ornl.gov/news/star-lab-tests-whether-battery-advances-can-scale>

Collected: September 25, 2026 | Automated Research System (Gemini API)

#02 Vanderbilt University: Li-S battery 1700 Wh/kg capacity specs

Published September 23, 2026 Vanderbilt University (via Nature Energy) USA



OVERVIEW

Researchers from Vanderbilt and Maryland Universities have unveiled a novel battery chemistry published in Nature Energy, significantly enhancing lithium-sulfur (Li-S) battery energy storage capabilities. By introducing chlorine into the electrode, sulfur can participate in an additional third electron transfer reaction, boosting sulfur's charge capacity by approximately 58%. This breakthrough elevates the battery's average operating voltage from 2.05V to 2.54V and enables experimental cells to store over 1,700 Wh per kilogram of sulfur, paving the way for vastly improved EV range and grid-scale storage.

Key Findings

A collaborative research team from Vanderbilt University and the University of Maryland has developed a groundbreaking electrode chemistry that dramatically improves the energy density of lithium-sulfur batteries. Published in *Nature Energy*, their work surpasses current Li-S battery performance limits by enabling sulfur to participate in more electron transfer reactions than previously thought. Specifically, by incorporating chlorine into the electrode system, the team successfully induced an additional third electron exchange reaction in sulfur, increasing its charge capacity by approximately 58%. This innovation raised the battery's average operating voltage from about 2.05 volts to 2.54 volts, achieving a remarkable energy storage capacity exceeding 1,700 watt-hours (Wh) per kilogram of sulfur in experimental cells.

Technical Details

Lithium-sulfur batteries theoretically offer much higher energy densities than conventional lithium-ion batteries but face challenges such as sulfur's low conductivity, significant volume changes during cycling, and polysulfide dissolution. This research overturns the conventional understanding that sulfur typically exchanges only up to two electrons. The team discovered that in the presence of chlorine, sulfur reversibly engages in a three-electron transfer mechanism. This 'triple electron exchange reaction' effectively increases sulfur's theoretical capacity, enabling more efficient energy storage. The researchers state that this new chemistry unlocks the full potential of sulfur, propelling battery performance to the next level.

Background and Industry Context

Li-S batteries are considered a promising next-generation technology due to the abundance and low cost of sulfur as a cathode material, offering a potential alternative to lithium-ion batteries that rely on expensive cobalt and nickel. However, realizing their full potential has historically required significant technological breakthroughs. The Vanderbilt study provides a deeper understanding of fundamental electrode chemistry, offering a materials science solution to long-standing challenges. This advancement is expected to accelerate the commercialization pathway for Li-S batteries.

Strategic Significance and Outlook

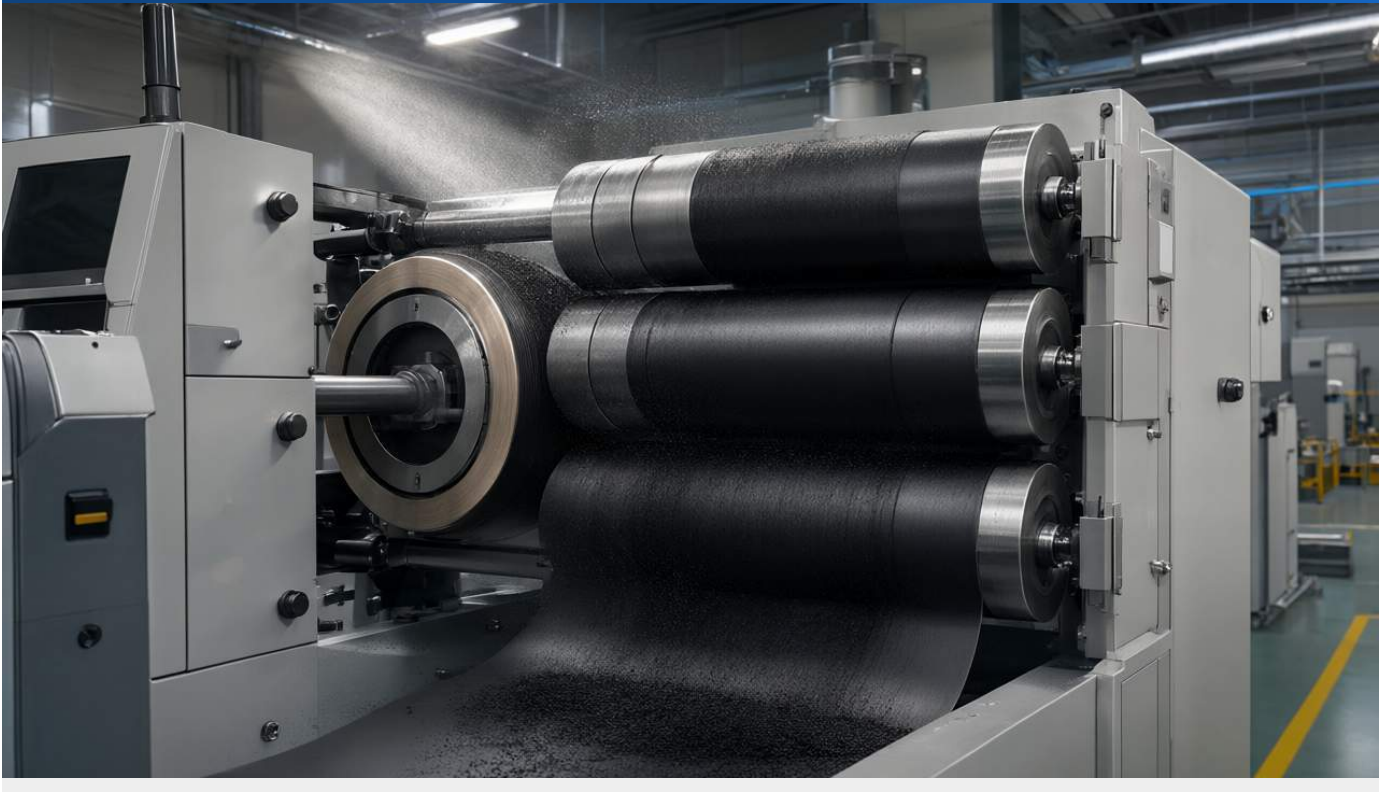
This pivotal discovery has the potential to significantly extend the driving range of electric vehicles (EVs), alleviating current limitations related to charging frequency and travel distance. Furthermore, for grid-scale energy storage systems designed to store large amounts of renewable energy, this technology promises substantial benefits in both cost-efficiency and energy density. The research team is committed to scaling up this technology, focusing on improving material stability and cycle life for practical applications. This achievement positions the US at the forefront of the competitive landscape for next-generation battery technologies.

Source: <https://engineering.vanderbilt.edu/2026/09/22/new-battery-chemistry-could-help-lithium-sulfur-batteries-store-more-energy/>

Collected: September 25, 2026 | Automated Research System (Gemini API)

#03 AM Batteries: \$50M US DOE dry electrode manufacturing roadmap

Published September 19, 2026 PRNewswire (for AM Batteries) USA



OVERVIEW

AM Batteries has been selected as a key sub-awardee in a \$50 million US Department of Energy (DOE) project led by Coreshell Technologies, focusing on scaling domestic battery manufacturing using its dry electrode (DBE) technology. The initiative aims to establish approximately 2 GWh of electrode manufacturing and 1.5 GWh of cell assembly capacity in the US. AM Batteries' dry manufacturing process can reduce capital expenditures for electrode manufacturing by up to 40% and operational costs by over 50%, significantly decreasing the carbon footprint of battery factories.

Key Findings

AM Batteries has been awarded as a key sub-recipient in a \$50 million US Department of Energy (DOE) project, led by Coreshell Technologies, dedicated to expanding domestic battery manufacturing capacity. This initiative leverages AM Batteries' proprietary powder-to-electrode dry battery manufacturing technology to significantly scale up US-based battery production. The project specifically targets establishing approximately 2 GWh of electrode manufacturing capacity and 1.5 GWh of cell assembly capacity within the United States, aiming to support the production of low-cost, high-performance cells for electric vehicle (EV) and defense applications.

Technical Details

AM Batteries' Dry Battery Electrode (DBE) manufacturing technology represents a significant departure from conventional solvent-based electrode coating processes widely used in lithium-ion battery production. Traditional wet processes require dispersing electrode materials in a solvent-based slurry, which is then coated and dried at high temperatures, contributing substantially to manufacturing costs and energy consumption. The DBE technology eliminates this solvent drying and recovery process, potentially reducing capital expenditures by up to 40% and operational costs by over 50%. Furthermore, this process dramatically lowers the carbon footprint of battery manufacturing plants, fostering more sustainable production practices.

Background and Industry Context

The US government is actively promoting policies to strengthen its domestic clean energy manufacturing base and reduce reliance on foreign supply chains. Establishing a robust domestic supply chain for batteries—critical components for EVs and renewable energy storage—is a pressing concern for both economic security and climate change mitigation. This DOE grant is designed to foster the development and scale-up of innovative domestic battery manufacturing technologies, thereby enhancing US competitiveness. Dry electrode technology, garnering attention from major battery manufacturers like Tesla, is a promising area for widespread adoption.

Strategic Significance and Outlook

The large-scale deployment of AM Batteries' dry electrode manufacturing technology through this DOE project could substantially lower US battery production costs, bolstering the competitiveness of domestic manufacturing. This is expected to accelerate EV adoption and stabilize power grids, thereby contributing to the achievement of US energy transition goals. The company aims to establish mass production capabilities for high-performance, environmentally friendly battery cells based on this technology, solidifying its position as a leader in next-generation energy storage solutions. Continued optimization and overcoming scale-up challenges will be key focal points moving forward.

Source: <https://batteriesnews.com/am-batteries-partnered-on-50-million-us-department-of-energy-award-to-scale-domestic-battery-manufacturing-with-dry-coating-technology/>

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#04 KRICT: g-C₃N₄ dry electrode mobility and wettability explained

Published September 22, 2026 English News1 South Korea



OVERVIEW

Researchers at the Korea Research Institute of Chemical Technology (KRICT) have developed a groundbreaking technique to simultaneously boost electrolyte wettability and lithium-ion mobility by merely adding 0.5% graphitic carbon nitride (g-C₃N₄) to electrodes. This innovation addresses critical challenges in dry electrode manufacturing, improving performance for high-energy density electric vehicle (EV) batteries. Dry electrode technology, which eliminates solvent drying, promises substantial reductions in battery manufacturing costs, energy consumption, and production footprint.

Key Findings

A research team at the Korea Research Institute of Chemical Technology (KRICT) has achieved a significant breakthrough in the development of high-energy density batteries for electric vehicles (EVs). They successfully and simultaneously improved both electrolyte wettability and lithium-ion mobility—two major challenges in dry electrode technology—by incorporating a mere 0.5% of graphitic carbon nitride ($\text{g-C}_3\text{N}_4$) into electrode materials. This achievement significantly contributes to the realization of a more efficient and cost-effective battery manufacturing process that does not rely on conventional wet methods.

Technical Details

Dry electrode manufacturing technology is gaining attention as a next-generation approach for lithium-ion battery electrode fabrication, as it eliminates the need for expensive and environmentally harmful organic solvents. This process has the potential to drastically reduce manufacturing costs, energy consumption, and production space. However, dry-processed electrodes typically suffer from poor electrolyte wettability and slow ion conduction within the electrode. The KRICT team leveraged the unique surface properties and structure of $\text{g-C}_3\text{N}_4$ to adjust the surface energy of the electrode materials, thereby enhancing the 'wettability' for efficient electrolyte penetration. Simultaneously, $\text{g-C}_3\text{N}_4$ was found to optimize the lithium-ion transport pathways, improving ion conductivity. These dual enhancements directly impact battery charge/discharge efficiency and lifespan, representing a critical advancement for EV batteries requiring high power and energy density.

Background and Industry Context

The demand for lithium-ion batteries is soaring due to the proliferation of EVs and energy storage systems (ESS). However, the electrode manufacturing step, which constitutes a large portion of the battery production process, incurs substantial costs and energy due to solvent use and drying, with environmental regulations becoming increasingly stringent. Against this backdrop, dry electrode technology is being actively researched and developed globally as a crucial solution for reducing manufacturing costs, lessening environmental impact, and improving productivity. KRICT's latest achievement significantly accelerates the commercialization of this technology.

Strategic Significance and Outlook

KRICT's research dramatically increases the commercial viability of dry electrode technology, poised to directly impact the performance enhancement and cost reduction of next-generation EV batteries. This could further accelerate the adoption of electric vehicles and promote the transition to more sustainable transportation systems. Furthermore, applying this technology to large-scale ESS could contribute to the expansion of renewable energy integration and grid stabilization. The next steps toward commercialization will involve process optimization for mass production and rigorous verification of long-term stability.

Source: <https://en.news1.kr/economy/6287316>

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#05 Amprius Technologies: 450 Wh/kg silicon anode cell EV timeline

Published September 24, 2026 Discovery Alert USA



OVERVIEW

Amprius Technologies has begun commercial shipments of nearly pure silicon anode cells with an energy density of up to 450 Wh/kg for aerospace and light EV customers, marking a pivotal moment for EV battery technology. This achievement, coupled with Group14 and Sionic Energy's December 2024 announcement of composite cells reaching 330 Wh/kg and enduring 1,200 cycles, confirms that high-performance silicon anodes are no longer a theoretical concept. The critical issue of 300% volume expansion during charging, which causes silicon particle fracture and degradation, is now being commercially addressed through advanced engineering approaches, including silicon-graphite blends, silicon-carbon composites, and nanowire encapsulation.

Key Findings

Amprius Technologies has initiated commercial shipments of its near-pure silicon anode cells, boasting an impressive energy density of up to 450 Wh/kg, to clients in the aerospace and lightweight electric vehicle (EV) sectors. This represents a significant breakthrough poised to redefine EV battery performance and range capabilities.

Technical and Clinical Details

Silicon anodes have long been recognized for their theoretical potential to offer significantly higher energy density (approximately 10 times) and specific capacity (around 3,579 mAh/g compared to graphite's 372 mAh/g) than conventional graphite anodes. However, their practical application has been hindered by a substantial volume expansion of up to 300% during charging. This expansion leads to particle fracturing and electrode degradation, severely impacting battery life and safety.

This article highlights several advanced engineering solutions that are now commercially viable to mitigate this critical volume expansion issue:

- **Silicon-Graphite Blends:** These materials combine the stability of graphite with the high capacity of silicon, effectively moderating volume expansion while boosting energy density.
- **Silicon-Carbon Composites:** Encapsulating silicon particles within a carbon matrix helps absorb the stress from expansion, maintaining structural integrity. Notably, Apple is reportedly integrating silicon-carbon technology into the iPhone 18 battery.
- **Nanowire Encapsulation:** By structuring silicon into nanowires, micro-architectures are created that can withstand significant volume changes, enhancing electrode durability.

Beyond Amprius's achievements, Group14 and Sionic Energy further validated the commercial readiness of high-performance silicon anodes by announcing in December 2024 the development of composite cells achieving 330 Wh/kg with an impressive cycle life of 1,200 cycles. These developments unequivocally shift silicon anode technology from laboratory curiosity to a practical, deployable solution.

Background and Industry Context

The burgeoning EV market and the broader push towards electrification demand next-generation battery technologies that offer extended range, faster charging, and enhanced safety. Innovations in anode materials, alongside cathode advancements, are critical for elevating lithium-ion battery performance. Silicon anodes are particularly promising for transforming EV capabilities and are increasingly supported by government initiatives worldwide. The benefits also extend to weight-sensitive applications such as the aerospace industry.

Strategic Significance and Outlook

The commercialization of silicon anode technology is expected to profoundly impact the EV market by enabling longer driving ranges and alleviating pressure on charging infrastructure. As further research and development drive down costs and improve scalability, silicon anodes are highly likely to become the standard for future EV batteries. This will undoubtedly trigger substantial shifts across the battery materials supply chain and related industries, fostering a new era of high-performance, compact, and durable energy storage solutions.

Source: <https://discoveryalert.com/education/silicon-anode-battery-ev-technology/>

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#06 Changan Automobile: First mass-produced CATL sodium-ion EV

Published September 21, 2026 Africa Business Insider China



OVERVIEW

Changan Automobile (China) is set to launch the world's first mass-produced sodium-ion electric vehicle this month, powered by CATL batteries. This move solidifies China's global leadership in sodium-ion battery production, with its planned capacity now exceeding 400 GWh, vastly surpassing the 11 GWh total of all other countries. Sodium-ion batteries, utilizing abundant materials, offer enhanced safety, faster charging, and superior performance in extreme temperatures, despite lower energy density, providing a critical new option for the EV market.

Key Findings

Chinese automaker Changan Automobile is poised to launch the world's first mass-produced electric vehicle (EV) powered by sodium-ion batteries supplied by CATL, scheduled for release this month. This development underscores China's commanding lead in sodium-ion battery production capacity, with current planned capacities exceeding 400 GWh, significantly dwarfing the collective 11 GWh capacity of the rest of the world.

Technical / Clinical Details

The upcoming Changan EV will feature CATL's cutting-edge sodium-ion battery technology, marking a substantial step towards reducing reliance on lithium resources in EV manufacturing. While sodium-ion batteries generally have a lower energy density compared to their lithium-ion counterparts, they offer significant advantages, including reduced raw material costs due to the abundance of sodium, and enhanced supply chain security. Critically, these batteries demonstrate superior safety profiles, excellent fast-charging capabilities, and robust performance across an extreme temperature range, from -40°C to $+70^{\circ}\text{C}$. These characteristics make them highly attractive for cost-sensitive markets and vehicles operating in diverse environmental conditions.

Background & Context

The global automotive and energy storage industries are increasingly facing challenges related to lithium resource scarcity and price volatility. In this context, sodium-ion batteries have rapidly emerged as a promising next-generation alternative. The Chinese government has strategically supported the development and large-scale production of this technology, recognizing its critical importance. Changan Automobile's deployment of a sodium-ion EV is not merely a technological achievement but a powerful statement reinforcing China's position as a global leader in both EV and battery technologies. While nations like the U.S. and France are also advancing sodium-ion research, China's current production dominance significantly impacts the international competitive landscape.

Strategic Significance & Outlook

The introduction of Changan's sodium-ion EV is expected to usher in a new wave of competition in the global EV market, offering consumers a broader array of choices. The lower upfront costs and wide temperature operability of sodium-ion batteries could particularly accelerate EV adoption in emerging markets and regions with challenging climates. China's proactive stance in scaling sodium-ion technology and production capacity positions it to further expand its influence in the global battery market in the coming years. This will likely spur other nations to intensify their investments and efforts in building their own sodium-ion battery ecosystems to counter China's burgeoning dominance.

Source: <https://africa.businessinsider.com/local/markets/china-emerges-as-the-worlds-sodium-battery-powerhouse-ahead-of-us-france-as-africa/ce13t07>

Collected: September 25, 2026 | Automated Research System (Gemini API)

#07 Hithium: Specs for 20,000-cycle sodium-ion cell and 4MWh BESS

Published September 17, 2026 Energy-Storage.News China



OVERVIEW

Hithium has introduced a pioneering sodium-ion cell achieving an industry-leading 20,000-cycle lifespan, along with a 4MWh Battery Energy Storage System (BESS) integrating this technology. This breakthrough is attributed to novel hard carbon anode materials with high-speed sodium-ion transport channels and a specialized electrolyte leveraging micro-bonding and targeted repair mechanisms. These innovations concurrently ensure ultra-low expansion and high-rate performance while dramatically improving ion diffusion, elevating the practical viability of sodium-ion batteries.

Key Findings

Hithium has announced a significant breakthrough in sodium-ion battery technology, unveiling a new sodium-ion cell capable of an astounding 20,000 cycles, an industry-leading lifespan. Concurrently, the company introduced a 4MWh Battery Energy Storage System (BESS) integrating this advanced cell, marking a pivotal step towards the widespread commercial deployment of sodium-ion solutions.

Technical / Clinical Details

The exceptional long life of Hithium's new sodium-ion cell is primarily driven by two key technological advancements. First, the development of a unique hard carbon anode material features high-speed sodium-ion transport channels and abundant sodium storage sites. This material exhibits both ultra-low expansion and excellent high-rate performance, critically enhancing the battery's structural integrity and charge/discharge efficiency over extended use. Second, an innovative sodium-ion-specific electrolyte has been engineered, employing micro-bonding and a targeted repair mechanism. This specialized electrolyte dramatically improves ion diffusion kinetics within the cell. The synergy of these innovations results in minimal degradation over numerous charge-discharge cycles, enabling the unprecedented 20,000-cycle lifespan. This level of durability makes the technology exceptionally well-suited for grid-scale energy storage systems, where long operational life and reliability are paramount for stabilizing variable renewable energy sources like solar and wind power, offering significant economic and performance advantages.

Background & Context

While lithium-ion batteries are prevalent, concerns regarding finite lithium resources, supply chain vulnerabilities, and cost challenges in certain applications persist. Sodium-ion batteries, leveraging abundant sodium as their primary raw material, offer a compelling alternative with the potential for reduced material costs and enhanced sustainability. Historically, sodium-ion batteries have faced challenges in matching the cycle life and energy density of lithium-ion counterparts. Hithium's achievement of a 20,000-cycle lifespan represents a major leap in overcoming these limitations, positioning sodium-ion batteries as a highly competitive solution for the large-scale stationary energy storage market.

Strategic Significance & Outlook

The introduction of Hithium's ultra-long-life sodium-ion cell and 4MWh BESS provides a powerful new option for the stationary energy storage market. The extended lifespan and high reliability directly translate into reduced operational costs and shorter payback periods for investors in grid stabilization, peak shifting, and renewable energy integration projects. This innovation is expected to accelerate the adoption of sodium-ion batteries across various BESS applications, ranging from large-scale utility installations to commercial and industrial deployments. Hithium's technology is poised to expedite the industrialization of sodium-ion batteries, contributing significantly to the establishment of more sustainable and resilient energy infrastructures worldwide, aligning with global decarbonization efforts and the pursuit of energy independence.

Source: <https://www.energy-storage.news/hithium-unveils-20000-cycle-sodium-ion-cell-and-4mwh-bess/>

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#08 BYD: 10,000-cycle sodium battery and CATL 60 GWh supply deal

Published September 24, 2026 GLOBENERGIA ポーランド



OVERVIEW

BYD announced on February 9, 2026, the development of high-performance sodium batteries achieving a cycle life of up to 10,000 cycles. Concurrently, CATL revealed on May 9, 2026, plans to invest \$735 million USD to expand its sodium battery production capacity by 40 GWh in Fujian province. Furthermore, on April 28, 2026, CATL and HyperStrong inked the world's largest sodium-ion energy storage cooperation agreement, underscoring both companies' aggressive push towards sodium-ion battery commercialization.

Key Findings

BYD announced on February 9, 2026, the successful development of high-performance sodium batteries boasting an exceptionally long cycle life of up to 10,000 cycles.

Mirroring this advancement, CATL has made successive announcements regarding its sodium-ion battery production capacity expansion and significant supply agreements, thereby strengthening Chinese companies' leadership in the next-generation battery market.

Technical / Clinical Details

The 10,000-cycle lifespan achieved by BYD's sodium batteries is a crucial performance metric, particularly for stationary energy storage systems (ESS). This longevity has the potential to drastically reduce battery replacement frequency during operation, leading to a lower total cost of ownership (TCO). Meanwhile, CATL's initiatives are equally aggressive. On May 9, 2026, CATL disclosed plans to invest \$735 million USD (approximately ¥5 billion RMB) to expand its sodium battery production capacity by 40 GWh in Fujian province. This substantial increase will significantly boost CATL's overall sodium-ion battery output, enhancing its market supply capabilities. Additionally, the world's largest sodium-ion energy storage cooperation agreement, signed between CATL and HyperStrong on April 28, 2026, suggests the technology is maturing for utility-scale deployment. These combined technical and business developments clearly indicate that sodium-ion batteries are increasingly being positioned as a leading alternative to lithium-ion technology.

Background & Context

Supply chain instabilities and price fluctuations for lithium resources remain significant challenges for the global battery industry. In this context, sodium-ion batteries, by utilizing abundant and inexpensive sodium as their primary raw material, are gaining traction as a sustainable and cost-effective alternative solution. The Chinese government has actively supported the research, development, and industrialization of sodium-ion batteries, aiming to diversify battery supply chains and foster domestic technological advancements. These announcements from two of China's battery giants, BYD and CATL, further validate China's established global technological and commercial superiority in this domain.

Strategic Significance & Outlook

The progress in sodium battery technology and the large-scale commercialization strategies by BYD and CATL are poised to have a profound impact on both the energy storage and electric mobility markets. Sodium batteries with a 10,000-cycle lifespan will particularly demonstrate their maximum value in grid-scale energy storage and renewable energy integration, where long durability is essential. CATL's production capacity expansion and its agreement with HyperStrong are expected to accelerate the market penetration of sodium-ion batteries and enhance their price competitiveness. This could lead to a shift away from lithium-ion batteries in certain applications, contributing to the resilience and diversification of the overall battery industry's supply chain and supporting a more sustainable energy transition.

Source: <https://globenergia.pl/mialy-byc-tanie-trwale-i-odporne-na-mroz-sprawdzamy-co-zostalo-z-obietnic-baterii-sodowych/>

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#09 Mitsubishi Motors: EV second-life battery project for Australia

Published September 23, 2026 The Driven IO / Flinders University / Mitsubishi Motors Australia / ResourceCo Australia



OVERVIEW

Flinders University in South Australia, in partnership with Mitsubishi Motors Australia and ResourceCo, is developing a commercially viable pathway to repurpose used EV batteries for stationary energy storage in homes, farms, and remote communities. This project aims to establish scalable utilization of second-life EV batteries by developing automated manufacturing processes integrated with battery management systems, demonstrating real-world prototypes. This initiative significantly extends battery lifespan, promoting resource efficiency and grid stabilization.

Key Findings

Flinders University in South Australia has announced a groundbreaking partnership with Mitsubishi Motors Australia and ResourceCo to develop a commercially viable pathway for repurposing used electric vehicle (EV) batteries as energy storage units for homes, farms, and remote communities. The core of this project is to establish an automated manufacturing process, integrated with battery management systems (BMS), to enable the large-scale and efficient reuse of second-life EV batteries. This initiative is a pioneering achievement, dramatically extending battery lifecycles and contributing to resource sustainability and regional grid stabilization.

Technical / Clinical Details

- **Establishing Scalable Reuse Pathways:** The research team is focused on developing an automated process for assessing battery health and reconfiguring them for stationary energy storage. This will streamline everything from individual battery pack diagnostics to repackaging, ensuring the scalability needed to repurpose a large volume of EV batteries.
- **Integration with Battery Management Systems:** The proposed solution will closely integrate with existing battery management systems to optimize the performance and maintain the safety of second-life batteries. This makes it possible to identify and isolate degraded battery cells, maximizing the utilization of the remaining healthy components.
- **Real-World Prototype Demonstration:** Beyond laboratory validation, the project aims to deploy prototype systems in actual homes and communities to demonstrate their performance and reliability in real-world conditions. This will validate the commercial viability of second-life battery solutions.

Background & Context

The proliferation of EVs has made the disposal of used batteries a global challenge. Even when these batteries reach the end of their life for EV applications, they often retain 70-80% of their original capacity, leaving substantial remaining life for stationary energy storage. Consequently, repurposing is gaining attention as an opportunity for efficient resource utilization, environmental burden reduction, and new value creation. Advanced initiatives are already underway, such as in Japan, where second-life batteries are repurposed for self-powered streetlights in Osaka City.

Strategic Significance & Outlook

This Flinders University project represents a significant step towards establishing a second-life battery industry in Australia. If commercially viable reuse pathways are established, it can dramatically reduce the environmental impact across the entire EV battery lifecycle and bring stability and resilience to electricity grids. Through international collaboration, this technology and business model are expected to expand to other countries, significantly contributing to a global sustainable energy transition. In the future, the introduction of traceability systems like battery passports will further enhance the transparency and efficiency of the reuse market.

Source: <https://thedriven.io/2026/09/24/australian-researchers-seek-pathway-to-ensure-ev-batteries-get-a-second-life-supporting-the-grid/>

Collected: September 25, 2026 | Automated Research System (Gemini API)

#10 Battwoo: Repurposing EV batteries for 30% solar storage cost

Published September 21, 2026 pv magazine Global / Battwoo France



OVERVIEW

French startup Battwoo is repurposing used electric vehicle (EV) batteries into stationary energy storage systems for solar self-consumption and commercial/industrial applications. Their refurbished systems are approximately 30% cheaper than new batteries and can extend service life by several decades. This initiative ensures that 70-80% of EV batteries, still retaining significant capacity after their initial lifespan, are reused rather than recycled, combining resource efficiency with cost savings.

Key Findings

French startup Battwoo offers an innovative solution by repurposing used electric vehicle (EV) batteries into stationary energy storage systems for solar self-consumption and various commercial and industrial applications. This refurbished system achieves a remarkable 30% cost reduction compared to new batteries while extending the battery's service life by several more decades. This ensures that EV batteries, which still retain 70% to 80% of their capacity after their initial lifespan, are efficiently utilized without immediate recycling, thereby maximizing valuable resources.

Technical / Clinical Details

- **Cost-Effective Repurposing:** Battwoo's solution involves rigorously inspecting, evaluating, and reconfiguring existing EV battery modules to create high-performance and safe stationary energy storage systems. This process circumvents the high costs and resource consumption associated with manufacturing new batteries, significantly improving the overall cost-effectiveness of the system.
- **Extended Lifespan and Reduced Environmental Impact:** By diverting EV batteries to stationary applications, the overall lifecycle of the batteries is extended, and waste generation is reduced. This is a crucial contribution to promoting a circular economy model, especially considering the high environmental footprint of battery manufacturing.
- **Versatility Across Applications:** The repurposed battery systems not only enhance the self-consumption rate of residential solar power but also function as peak shaving, load leveling, and backup power solutions for commercial facilities and industrial plants. This promotes the integration of renewable energy and contributes to grid stabilization.

Background & Context

As EV adoption accelerates globally, the proper management and processing of used EV batteries have become significant challenges. Efficiently repurposing these batteries is essential for conserving scarce mineral resources, reducing CO2 emissions, and improving supply chain resilience. Regulations and initiatives to enhance battery sustainability and circularity are strengthening across France and the wider EU, and Battwoo's activities align with these policy objectives.

Strategic Significance & Outlook

Battwoo's solution has the potential to maximize the value of used EV batteries and establish new business models in the stationary energy storage market. As the supply of EV batteries increases, the demand for such repurposing technologies will also grow. The widespread adoption of standardized testing methods and traceability systems like battery passports is expected to enhance market transparency and reliability, supporting large-scale deployment. This initiative will improve the sustainability of the entire battery value chain and accelerate the transition to a cleaner energy future.

Source: <https://www.pv-magazine.com/2026/09/21/french-startup-repurposes-ev-batteries-for-solar-energy-storage/>