TROY TECHNICAL

ALL-SOLID-STATE BATTERIES

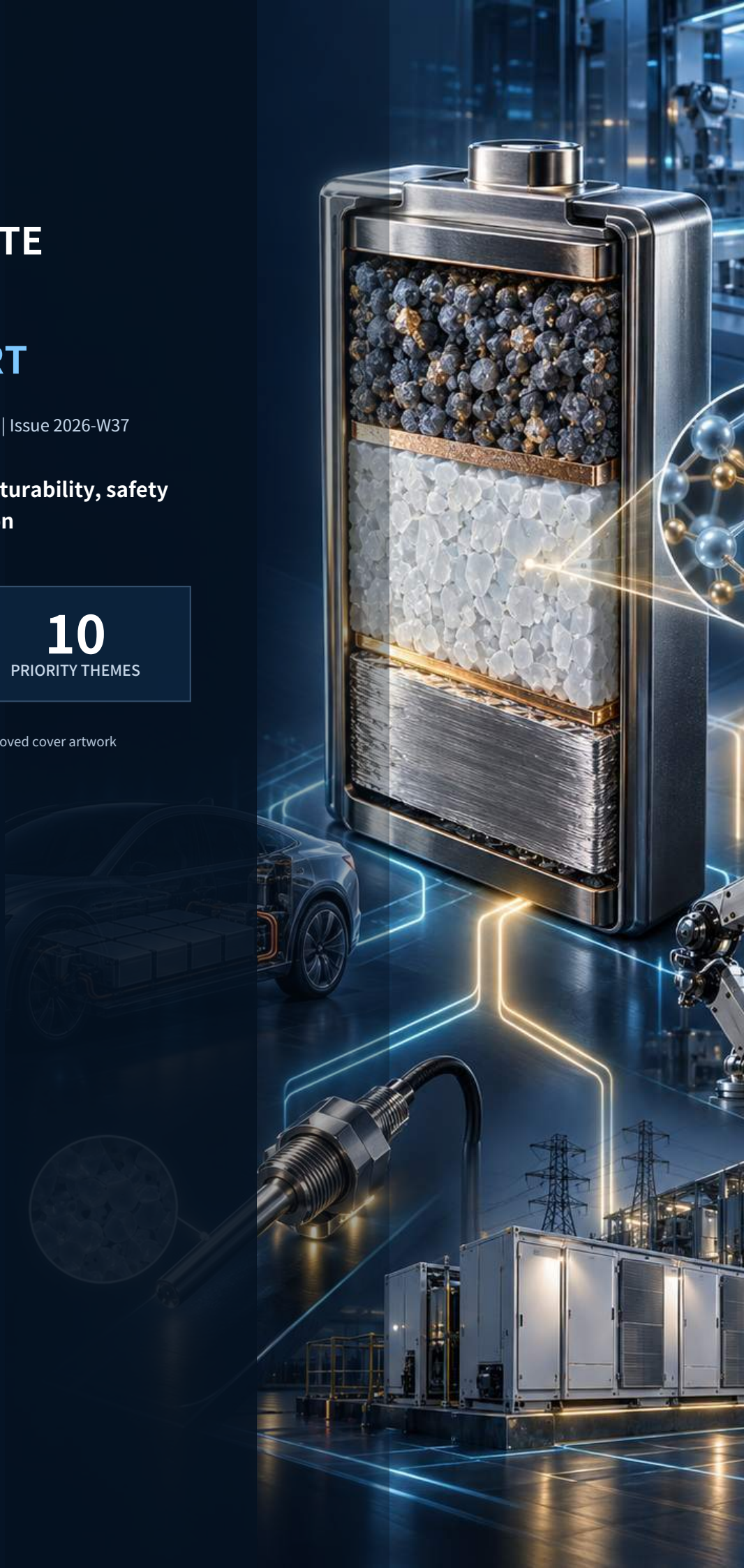
WEEKLY REPORT

September 12 - September 18, 2026 | Issue 2026-W37

Interface stability, manufacturability, safety and automotive qualification

17	10
ANALYZED ARTICLES	PRIORITY THEMES

Issued 2026-09-18 | English edition | fixed approved cover artwork



All-Solid-State Batteries: the boundary moved from isolated claims to qualification evidence

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

SIGNAL 01 | ELECTROLYTE

Chinese Manufacturers Accelerate Solid-State Battery Pilot Line Operations by 2026-2027, Raising Concerns of

Multiple leading Chinese battery manufacturers, including BYD, Gotion High-tech, and CATL, have rapidly activated or completed pilot and experimental solid-state battery production lines between 2025 and 2026.

SIGNAL 02 | ELECTRODE INTERFACE

ProLogium Commences Mass Production of High-Energy-Density All-Solid-State Batteries, Achieving 381 Wh/kg and 903

ProLogium Technology has begun mass production of its Gen 3.5 Lithium Ceramic Batteries (LCB) at its gigafactory in Taiwan.

SIGNAL 03 | CELL PROCESS

China's 15th Five-Year Plan Accelerates Solid-State Battery Industrialization; Chery Targets 2027 Vehicle Validation

China's Ministry of Industry and Information Technology (MIIT) and National Development and Reform Commission (NDRC) announced explicit support for solid-state battery industrialization within the 15th Five-Year Plan for Electronic Information Manufacturing.

SIGNAL 04 | VALIDATION

Factorial Energy Partners with Mitsui Kinzoku to Accelerate Industrialization of 450 Wh/kg SolsticeTM

Factorial Energy announced a strategic partnership with Mitsui Kinzoku to industrialize its SolsticeTM solid-state battery platform, which boasts an energy density up to 450 Wh/kg-80% higher than conventional lithium-ion batteries-and stable operation up to.

DECISION

Focus this week's management attention on interface stability, manufacturability, safety and automotive qualification. Move only when the linked evidence can be reproduced under your own operating conditions.

THREE MANAGEMENT MOVES

1. Buyers: compare cell evidence under practical loading, pressure, temperature and cycle conditions.
2. Suppliers: show powder, interface and process consistency together with scale and cost.
3. Executives: track loading, pressure, interface resistance, yield, safety, capacity and timing.

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

20 GW
A04

SOURCE-BOUND CONDITION
BYD initiated a 20 GWh mass production line in Chongqing in Q3 2026, targeting small-batch vehicle integration by Q1 2027, while CATL operationalized the first phase of its solid-state battery base exceeding 500 Wh/kg.

381 W
A03

SOURCE-BOUND CONDITION
Third-party TÜV testing reports confirm the company's 185.4 Ah large-format cells achieve an impressive gravimetric energy density of 381 Wh/kg and a volumetric energy density of 903 Wh/L.

450 W
A12

SOURCE-BOUND CONDITION
Factorial Energy announced a strategic partnership with Mitsui Kinzoku to industrialize its SolsticeTM solid-state battery platform, which boasts an energy density up to 450 Wh/kg-80% higher than conventional lithium-ion.

900 W
A14

SOURCE-BOUND CONDITION
This innovative approach achieves a volumetric energy density of approximately 900 Wh/L, a ~40% increase over conventional NMC cells, setting a new benchmark for battery technology.

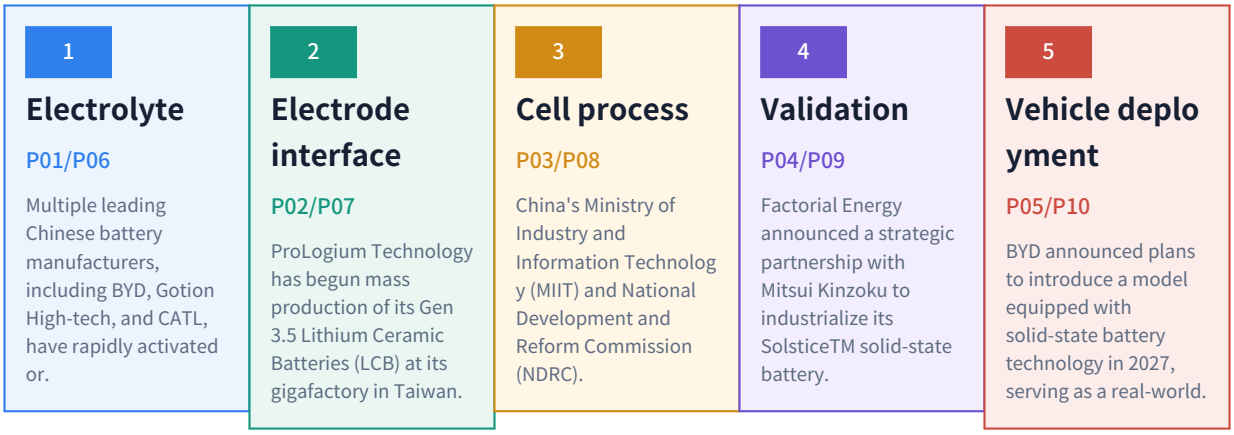
12.5 billi on
A17

SOURCE-BOUND CONDITION
is pushing forward with a large-scale project exceeding RMB 12.5 billion (approximately $1.75 billion USD) to produce and sell lithium-ion battery module assemblies and containerized energy storage systems.

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.



EVIDENCE REQUIRED AT EACH HANDOFF

Electrolyte to Electrode interface	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Electrode interface to Cell process	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Cell process to Validation	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Validation to Vehicle deployment	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.

COMMON CONTROL POINT

No theme moves to a commercial commitment until a named owner has reproduced the relevant evidence and documented loading, pressure, interface resistance, yield, safety, capacity and timing.

Priority map: maturity and business impact

P01	Chinese Manufacturers Accelerate Solid-State Battery Pilot Line Operations by 2026-2027, Raising Concerns of
P02	ProLogium Commences Mass Production of High-Energy-Density All-Solid-State Batteries, Achieving 381 Wh/kg and 903
P03	China's 15th Five-Year Plan Accelerates Solid-State Battery Industrialization; Chery Targets 2027 Vehicle Validation
P04	Factorial Energy Partners with Mitsui Kinzoku to Accelerate Industrialization of 450 Wh/kg SolsticeTM
P05	BYD to Launch Solid-State Battery Model in 2027: High-Cost Absorption Strategy for Yangwang
P06	Samsung SDI to Invest ₩16 Trillion in Ulsan for 2027 Solid-State Battery Mass
P07	Yuedong New Energy Accelerates Over RMB 12.5 Billion Project for 5 GWh/Year Semi-Solid
P08	Mitsui Kinzoku Partners with Factorial Energy to Scale All-Solid-State Battery Manufacturing, Leveraging Sulfide
P09	EV Makers and Battery Firms Target Early Solid-State Battery Production by 2027, Mass
P10	BYD to Deploy 1,000 Solid-State Battery Test Vehicles by 2027, Targets Mass Production

REPRODUCIBLE POSITIONING RULE

Horizontal position uses five discrete stages: Research, Prototype, Joint evaluation, Product adoption and Scale. Vertical position uses three impact levels: single use, multiple customers and multiple supply tiers. Bubble diameter reflects the editorial score inherited from the weekly selection rubric.

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

P01 Chinese Manufacturers Accelerate Solid-State Battery Pilot Line Operations by 2026-2027, Raising Concerns of

A04 | Electrolyte | Scale-up

Date not stated

FACT

Multiple leading Chinese battery manufacturers, including BYD, Gotion High-tech, and CATL, have rapidly activated or completed pilot and experimental solid-state battery production lines between 2025 and 2026. BYD initiated a 20 GWh mass production line in Chongqing in Q3 2026, targeting small-batch vehicle integration by Q1 2027, while CATL operationalized the first phase of its solid-state battery base exceeding 500 Wh/kg single-cell energy density in July 2026.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P01.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 23/25 | MATURITY 5/5 | IMPACT 2/3

P02 ProLogium Commences Mass Production of High-Energy-Density All-Solid-State Batteries, Achieving 381 Wh/kg and 903

A03 | Electrode interface | Scale-up

Date not stated

FACT

ProLogium Technology has begun mass production of its Gen 3.5 Lithium Ceramic Batteries (LCB) at its gigafactory in Taiwan. Third-party TÜV testing reports confirm the company's 185.4 Ah large-format cells achieve an impressive gravimetric energy density of 381 Wh/kg and a volumetric energy density of 903 Wh/L. Furthermore, UL Solutions certified these cells as all-solid-state batteries under China's GB/T 43568-2026 standard, demonstrating less than 0.05% weight loss under 120°C for 6 hours in vacuum.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P02.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 22/25 | MATURITY 5/5 | IMPACT 1/3

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

P03 China's 15th Five-Year Plan Accelerates Solid-State Battery Industrialization; Chery Targets 2027 Vehicle Validation

A13 | Cell process | Scale-up

Date not stated

FACT

China's Ministry of Industry and Information Technology (MIIT) and National Development and Reform Commission (NDRC) announced explicit support for solid-state battery industrialization within the 15th Five-Year Plan for Electronic Information Manufacturing. Following this policy push, automaker Chery plans to integrate hybrid solid-liquid batteries into vehicles by Q4 2026 and initiate vehicle validation for full solid-state batteries in 2027.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P03.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 22/25 | MATURITY 5/5 | IMPACT 2/3

P04 Factorial Energy Partners with Mitsui Kinzoku to Accelerate Industrialization of 450 Wh/kg SolsticeTM

A12 | Validation | Scale-up

Date not stated

FACT

Factorial Energy announced a strategic partnership with Mitsui Kinzoku to industrialize its SolsticeTM solid-state battery platform, which boasts an energy density up to 450 Wh/kg-80% higher than conventional lithium-ion batteries-and stable operation up to 90°C. This collaboration complements Factorial's existing ties with major automakers like Mercedes-Benz, Stellantis, and Hyundai, aiming to expand solid-state battery applications beyond automotive to aerospace, defense, and robotics.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P04.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | IMPACT 3/3

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

P05 BYD to Launch Solid-State Battery Model in 2027: High-Cost Absorption Strategy for Yangwang

A11 | Vehicle deployment | Scale-up

Date not stated

FACT

BYD announced plans to introduce a model equipped with solid-state battery technology in 2027, serving as a real-world validation platform for the technology. Sun Huajun, CTO of BYD's battery division, outlined a concrete schedule, commencing batch demonstration deployments in vehicles around 2027 and transitioning to large-scale mass production post-2030.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P05.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | IMPACT 2/3

P06 Samsung SDI to Invest ₩16 Trillion in Ulsan for 2027 Solid-State Battery Mass

A14 | Electrolyte | Scale-up

Date not stated

FACT

Samsung SDI announced a ₩16 trillion investment in its Ulsan plant, targeting mass production of all-solid-state batteries (ASB) by 2027. The company's ASB utilizes a sulfide-based solid electrolyte and an anode-free design with a ~5-micrometer silver-carbon (Ag-C) composite layer. This innovative approach achieves a volumetric energy density of approximately 900 Wh/L, a ~40% increase over conventional NMC cells, setting a new benchmark for battery technology.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P06.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | IMPACT 2/3

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

P07 Yuedong New Energy Accelerates Over RMB 12.5 Billion Project for 5 GWh/Year Semi-Solid

A17 | Electrode interface | Product adoption

Date not stated

FACT

Yuedong New Energy Technology (Zhejiang) Co., Ltd. is pushing forward with a large-scale project exceeding RMB 12.5 billion (approximately $1.75 billion USD) to produce and sell lithium-ion battery module assemblies and containerized energy storage systems. Upon completion, the company will have the capacity to produce 5 GWh of semi-solid battery PACK energy storage containers annually.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P07.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 4/5 | IMPACT 2/3

P08 Mitsui Kinzoku Partners with Factorial Energy to Scale All-Solid-State Battery Manufacturing, Leveraging Sulfide

A07 | Cell process | Joint evaluation

Date not stated

FACT

Factorial Energy Inc. announced a strategic partnership with Mitsui Kinzoku, a leading Japanese materials manufacturer, to industrialize Factorial's SolsticeTM all-solid-state battery platform. Mitsui Kinzoku will contribute its expertise as a key producer of sulfide-based solid electrolytes and a global leader in ultra-thin copper foil.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P08.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 3/5 | IMPACT 3/3

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

P09 EV Makers and Battery Firms Target Early Solid-State Battery Production by 2027, Mass

A01 | Validation | Scale-up

Date not stated

FACT

While current commercial 'solid-state' batteries are largely semi-solid hybrid designs, numerous automakers and battery manufacturers are planning pilot production of true all-solid-state batteries (ASSBs) between 2027 and 2028. Full-scale mass production is anticipated after 2030, marking a significant inflection point for the market.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P09.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | IMPACT 2/3

P10 BYD to Deploy 1,000 Solid-State Battery Test Vehicles by 2027, Targets Mass Production

A02 | Vehicle deployment | Scale-up

Date not stated

FACT

BYD plans to deploy demonstration vehicles equipped with its all-solid-state battery technology next year, as announced by Executive Vice President Stella Li. This initial technical demonstration phase will utilize 20Ah and 60Ah solid-state cell prototypes developed by FinDreams, focusing on a sulfide-based solid electrolyte route. The company aims for a small-batch test of approximately 1,000 vehicles around 2027, with large-scale commercial production targeted for around 2030.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. 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, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P10.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | IMPACT 2/3

Playbook and 0-5 year roadmap

STAKEHOLDER	NOW | 0-30 DAYS	NEXT | 1-12 MONTHS	LATER | 1-5 YEARS
Operating companies	compare cell evidence under practical loading, pressure, temperature and cycle conditions	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	show powder, interface and process consistency together with scale and cost	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 loading, pressure, interface resistance, yield, safety, capacity and timing.	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 01-09

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	EV Makers and Battery Firms Target Early Solid-State Battery Production by 2027, Mass Production Post-2030	https://www.evinfrastructurenews.com/ev-battery/solid-state-vs-lithium-ion-batteries
A02	BYD to Deploy 1,000 Solid-State Battery Test Vehicles by 2027, Targets Mass Production Around 2030	https://carnewschina.com/2026/09/13/byd-to-put-solid-state-battery-technology-into-a-vehicle-next-year-executive-confirms/
A03	ProLogium Commences Mass Production of High-Energy-Density All-Solid-State Batteries, Achieving 381 Wh/kg and 903 Wh/L with UL Certification	https://batteriesnews.com/prologium-begins-mass-production-of-high-energy-density-all-solid-state-battery-reaching-381-wh-kg-and-903-wh-l/
A04	Chinese Manufacturers Accelerate Solid-State Battery Pilot Line Operations by 2026-2027, Raising Concerns of Demand Mismatch	https://news.metal.com/newscontent/104120524-solid-state-battery-capacity-part-2-pilot-lines-in-quick-succession-capacity-planning-mismatches-demand
A05	BYD Leads Solid-State Battery Race with First EV Deployment Slated for 2027, FinDreams to Begin Sulfide-Based Small-Batch Production	https://electrek.co/2026/09/14/byd-leading-solid-state-battery-race-first-ev-2027/
A06	Purdue University Research Unveils Interfacial Defect Formation Mechanism in Solid-State Batteries, Earns 2026 Chorafas Award	https://engineering.purdue.edu/Engr/AboutUs/News/Spotlights/2026/20260910-purdue-engineering-aditya-singla-chorafas-award-solid-state-battery
A07	Mitsui Kinzoku Partners with Factorial Energy to Scale All-Solid-State Battery Manufacturing, Leveraging Sulfide Solid Electrolytes	https://markets.businessinsider.com/news/stocks/mitsui-kinzoku-partners-with-factorial-to-scale-all-solid-state-battery-manufacturing-1036553058
A08	Graphene Oxide-Polymer Composite Electrolyte Enables Dendrite-Free All-Solid-State Lithium Batteries, Retaining 80.44% Capacity After 200 Cycles	https://bioengineer.org/graphene-oxide-and-polymer-pairing-paves-way-for-dendrite-free-solid-state-lithium-batteries/
A09	Purdue University Research on Solid-State Battery Interfacial Defects Wins Engineering Research Award, Providing New Guidelines for High-Energy Battery Development	https://news.metal.com/en/newscontent/104118053-solid-state-battery-purdue-university-research-reveals-formation-mechanism-of-interfacial-defects-in-solid-state-batteries-wins-engineering-research-award

ANALYZED ARTICLES | ITEMS 10-17

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
A10	Microscopic Analysis of Dendrites: eScience Review Highlights Persistent Challenges for Solid-State Batteries	https://www.eurekalert.org/news-releases/1144183
A11	BYD to Launch Solid-State Battery Model in 2027: High-Cost Absorption Strategy for Yangwang and Denza	https://finance.biggo.com/news/a0e9dd04-2c2a-4ec7-bcac-17bc24326f62
A12	Factorial Energy Partners with Mitsui Kinzoku to Accelerate Industrialization of 450 Wh/kg SolsticeTM Solid-State Battery Platform	https://electrek.co/2026/09/17/solid-state-battery-maker-factorial-secures-another-big-partnership/
A13	China's 15th Five-Year Plan Accelerates Solid-State Battery Industrialization; Chery Targets 2027 Vehicle Validation, Tinci Materials Operates 100-Ton Pilot Line	https://news.metal.com/newscontent/104122948-solid-state-battery-weekly--%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8Bindustry-deepens-technologyiteration-amid-ebb-and-flow-policy-push-intensifies
A14	Samsung SDI to Invest ₩16 Trillion in Ulsan for 2027 Solid-State Battery Mass Production, Achieving 900 Wh/L with Silver-Carbon Anode-Free Design	https://news.metal.com/en/newscontent/104120442-samsung-plans-battery-breakthrough-in-2027-is-a-silver-shock-on-the-horizon
A15	German-US Collaboration Unlocks Microscopic Origins of Dendrite Formation in Solid-State Batteries via Comprehensive Review	https://www.azom.com/news.aspx?newsID=65787
A16	QuantumScape to Double Pilot Line Production by Year-End, Scaling Anode-Free Solid-State Battery Output for Expanding Market	https://www.marketbeat.com/instant-alerts/event-quantumscape-ramps-pilot-line-as-solid-state-battery-markets-expand-2026-09-16/
A17	Yuedong New Energy Accelerates Over RMB 12.5 Billion Project for 5 GWh/Year Semi-Solid Battery PACK Energy Storage Container Production	https://www.energytrend.com/news/20260917-52155.html

SolidStateBattery — Selected Articles

Date: 2026-09-20

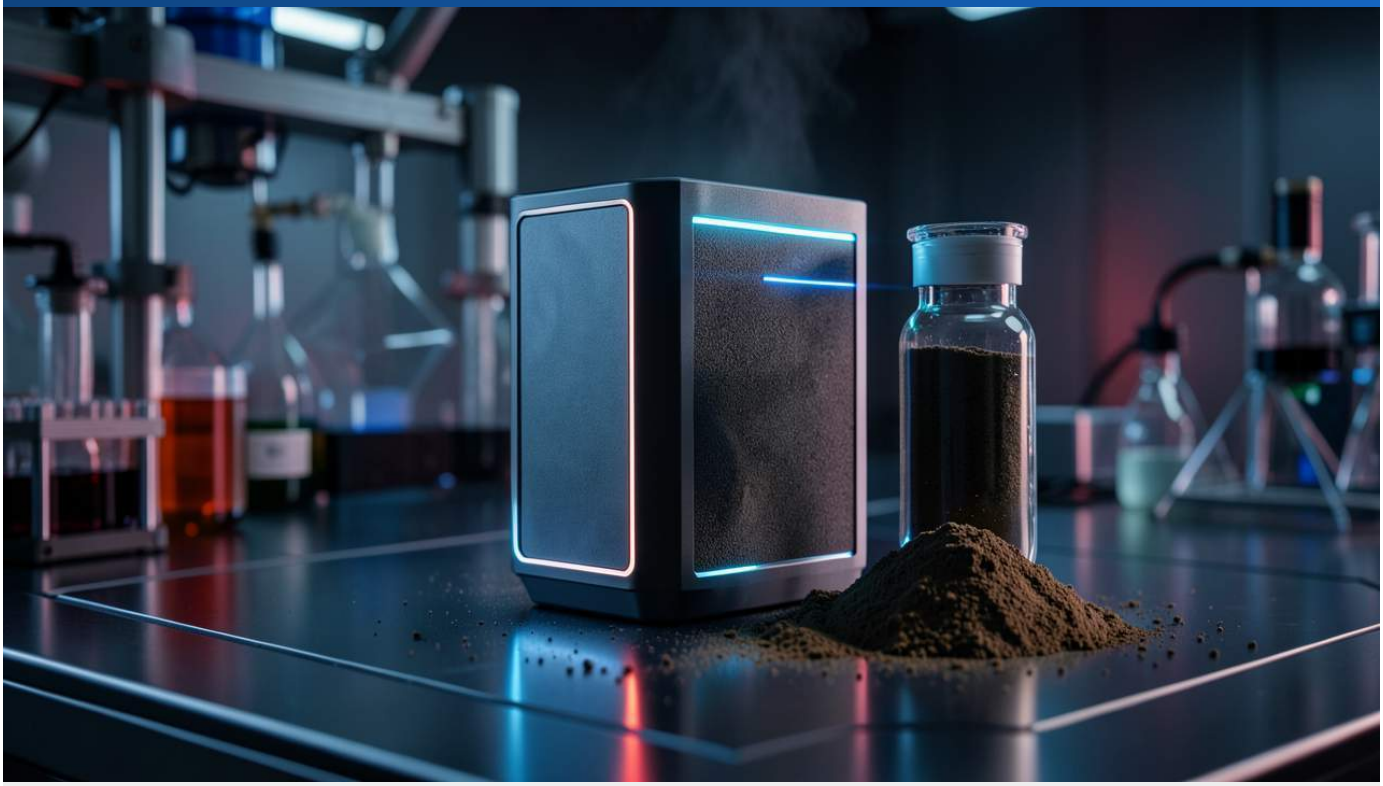
Articles: 17

Table of Contents

#17 Yuedong New Energy Accelerates Over RMB 12.5 Billion Project for 5 GWh/Year Semi-Solid Battery PACK Energy Storage Container Production

#01 EV Makers and Battery Firms Target Early Solid-State Battery Production by 2027, Mass Production Post-2030

Published September 10, 2026　(複数の情報源を引用)　International



OVERVIEW

While current commercial 'solid-state' batteries are largely semi-solid hybrid designs, numerous automakers and battery manufacturers are planning pilot production of true all-solid-state batteries (ASSBs) between 2027 and 2028. Full-scale mass production is anticipated after 2030, marking a significant inflection point for the market. QuantumScape projects an anode-free ASSB with 844Wh/L and 301Wh/kg energy density, achieving a 12-minute charge, while Geely aims for a 400Wh/kg battery pack by 2026, and Dongfeng targets 350Wh/kg and 1,000km range for mass production in 2027.

IN DEPTH

Key Findings

As of 2026, most commercially available 'solid-state batteries' are, in fact, semi-solid hybrid designs, not true all-solid-state batteries (ASSBs). However, a significant number of leading automotive manufacturers and battery developers are actively planning to commence pilot-scale production of genuine all-solid-state batteries between 2027 and 2028. Full-scale mass production is not expected until after 2030, reflecting the ongoing challenges in technological maturation and cost-efficiency required for widespread adoption.

Technical / Clinical Details

Companies are setting ambitious targets. US-based QuantumScape aims for pilot production in 2026, with mass production starting in 2027-2028. Their anode-free solid-state battery claims a volumetric energy density of 844 Wh/L, a gravimetric energy density of 301 Wh/kg, and a 10-80% charge time of approximately 12 minutes. In China, Geely plans to complete its 400 Wh/kg energy density solid-state battery pack by 2026. Dongfeng has already operationalized a 0.2 GWh pilot production line and aims for mass production of a 350 Wh/kg energy density battery pack with a 1,000 km range in 2027. These figures represent significant improvements over current high-performance lithium-ion batteries and promise to revolutionize EV capabilities.

Background & Context

All-solid-state batteries are heralded as the ultimate battery technology, poised to resolve critical issues faced by existing liquid-electrolyte lithium-ion batteries, including safety, energy density, and lifespan. Extending driving range and significantly reducing charging times are essential for accelerating EV adoption. Governments and corporations globally are investing heavily in this technology, engaging in intense competition to lead the next-generation battery market. The transition from semi-solid to true all-solid-state batteries is considered the next major breakthrough following lithium-ion technology.

Strategic Significance & Outlook

The commencement of pilot production from 2027 marks a crucial step towards the practical implementation of all-solid-state battery technology. However, significant challenges remain for subsequent mass production, including technological maturity, cost reduction, and the establishment of robust supply chains. Particularly, compatibility with existing lithium-ion battery manufacturing processes and improving production efficiency will be key to market penetration. With full market introduction anticipated after 2030, EV performance is expected to further improve, enhancing their competitiveness against gasoline-powered vehicles. This technological innovation has the potential to impact not only the automotive industry but also broader sectors such as energy storage and aerospace.

Source: https://www.evinfrastructurenews.com/ev-battery/solid-state-vs-lithium-ion-batteries

Collected: September 18, 2026 | Automated Research System (Gemini API)

#02 BYD to Deploy 1,000 Solid-State Battery Test Vehicles by 2027, Targets Mass Production Around 2030

Published September 13, 2026 CarNewsChina China

OVERVIEW

BYD plans to deploy demonstration vehicles equipped with its all-solid-state battery technology next year, as announced by Executive Vice President Stella Li. This initial technical demonstration phase will utilize 20Ah and 60Ah solid-state cell prototypes developed by FinDreams, focusing on a sulfide-based solid electrolyte route. The company aims for a small-batch test of approximately 1,000 vehicles around 2027, with large-scale commercial production targeted for around 2030.

IN DEPTH

Key Findings

Chinese automotive giant BYD plans to introduce demonstration vehicles equipped with its all-solid-state battery technology next year (2027), as confirmed by Executive Vice President Stella Li. This initiative represents a significant milestone in the company's solid-state battery development, forming part of a long-term roadmap that includes small-batch vehicle testing of around 1,000 units commencing in approximately 2027, with large-scale commercial production targeted for around 2030.

Technical / Clinical Details

FinDreams, BYD's battery division, is concentrating its development efforts on all-solid-state battery technology based on sulfide-based solid electrolytes. Currently, the company is developing 20Ah and 60Ah all-solid-state cell prototypes, aiming for an energy density approaching 400 Wh/kg. Sulfide-based solid electrolytes are known for their high ionic conductivity and excellent low-temperature characteristics, offering the potential for both high power output and enhanced safety. The deployment in demonstration vehicles next year will be the first step in validating the performance and reliability of this technology in real-world automotive environments.

Background & Context

All-solid-state batteries are considered the next-generation battery technology, offering superior safety, energy density, and charging speed compared to conventional liquid-electrolyte lithium-ion batteries. The global development race for this technology is intensifying. The Chinese government has prioritized solid-state battery technology as a national strategic initiative, prompting major players like BYD to accelerate their development. As a vertically integrated company producing everything from batteries to EVs, BYD's in-house solid-state battery development is crucial for establishing a competitive advantage in the future EV market.

Strategic Significance & Outlook

BYD's introduction of demonstration vehicles with solid-state batteries will be closely watched as it concretely showcases the feasibility of the technology. The small-batch testing of approximately 1,000 units, scheduled for around 2027, is essential for evaluating performance and gathering durability data under real-world conditions. Successful outcomes from this phase would pave the way for full-scale commercial production around 2030. However, key challenges remain, including cost reduction for retail sales and mass production, establishing manufacturing processes, and building robust supply chains. BYD's endeavors are expected to have a significant impact on the global EV and battery industries.

Source: https://carnewschina.com/2026/09/13/byd-to-put-solid-state-battery-technology-into-a-vehicle-next-year-executive-confirms/

#03 ProLogium Commences Mass Production of High-Energy-Density All-Solid-State Batteries, Achieving 381 Wh/kg and 903 Wh/L with UL Certification

Published September 17, 2026 GLOBE NEWSWIRE (ProLogium Technology経由) Taiwan

OVERVIEW

ProLogium Technology has begun mass production of its Gen 3.5 Lithium Ceramic Batteries (LCB) at its gigafactory in Taiwan. Third-party TÜV testing reports confirm the company's 185.4 Ah large-format cells achieve an impressive gravimetric energy density of 381 Wh/kg and a volumetric energy density of 903 Wh/L. Furthermore, UL Solutions certified these cells as all-solid-state batteries under China's GB/T 43568-2026 standard, demonstrating less than 0.05% weight loss under 120°C for 6 hours in vacuum. This marks a critical milestone for the commercialization of high-performance and safe solid-state batteries.

IN DEPTH

Key Findings

ProLogium Technology has announced the commencement of mass production for its Gen 3.5 Lithium Ceramic Batteries (LCB) at its gigafactory manufacturing facility in Taiwan. Independent TÜV test reports validate that the company's 185.4 Ah large-format cells achieve an extraordinary gravimetric energy density of 381 Wh/kg and a volumetric energy density of 903 Wh/L. Crucially, UL Solutions confirmed these cells meet China's GB/T 43568-2026 standard for all-solid-state batteries, demonstrating less than 0.05% weight loss after 6 hours in a vacuum at 120°C.

Technical / Clinical Details

ProLogium's Gen 3.5 LCB employs advanced lithium-ceramic technology to deliver a combination of high energy density and superior safety. Notably, these high-performance characteristics are achieved in a large 185.4 Ah cell format, which is significant for automotive applications. The high energy density directly translates to extended driving ranges for electric vehicles (EVs) and offers substantial advantages for applications where weight and space are critical constraints, such as aerospace and drones. The successful completion of stringent thermal tests by UL Solutions (120°C for 6 hours in vacuum) underscores the battery's high thermal stability and inherent safety, suggesting a significantly lower risk of thermal runaway compared to conventional liquid-electrolyte batteries. This validation directly supports the core safety promise of all-solid-state battery technology.

Background & Context

All-solid-state battery technology is widely regarded as the next-generation power source, poised to overcome the limitations of traditional liquid-electrolyte lithium-ion batteries across numerous sectors, particularly the automotive industry. While offering advantages in safety, higher energy density, longer lifespan, and faster charging, the complexity and cost of manufacturing have historically been major barriers to commercialization. ProLogium's initiation of mass production at a gigafactory scale represents a significant breakthrough in overcoming these hurdles, paving the way for the substantial market introduction of solid-state batteries. The Taiwanese government's strong support for ProLogium's technological advancements highlights its strategic importance in international competition.

Strategic Significance & Outlook

The commencement of mass production for ProLogium's high-energy-density all-solid-state batteries is expected to profoundly impact the EV industry. Specifically, the high gravimetric energy density could accelerate adoption in sectors such as aerospace, drones, and high-performance EVs. UL Solutions certification enhances international market credibility and positions the company favorably for customer acquisition. Future focus will include further scaling production, optimizing costs, and expanding into a wider range of applications. ProLogium's success is anticipated to drive the global development of the solid-state battery market and contribute to the widespread adoption of safer, higher-performing energy storage solutions.

Source: https://batteriesnews.com/prologium-begins-mass-production-of-high-energy-density-all-solid-state-battery-reaching-381-wh-kg-and-903-wh-l/

Collected: September 18, 2026 | Automated Research System (Gemini API)

#04 Chinese Manufacturers Accelerate Solid-State Battery Pilot Line Operations by 2026-2027, Raising Concerns of Demand Mismatch

Published September 17, 2026 Shanghai Metals Market (SMM) China

OVERVIEW

Multiple leading Chinese battery manufacturers, including BYD, Gotion High-tech, and CATL, have rapidly activated or completed pilot and experimental solid-state battery production lines between 2025 and 2026. BYD initiated a 20 GWh mass production line in Chongqing in Q3 2026, targeting small-batch vehicle integration by Q1 2027, while CATL operationalized the first phase of its solid-state battery base exceeding 500 Wh/kg single-cell energy density in July 2026. However, projected utilization rates for solid-state batteries are estimated at a low 1-15% between 2026 and 2030, indicating a potential significant mismatch between initial supply capacity and demand.

IN DEPTH

Key Findings

Leading Chinese battery manufacturers are accelerating their efforts towards the commercialization of all-solid-state battery technology, with numerous companies including BYD, Gotion High-tech, Qingtao, WeLion, CALB, EVE Energy, Farasis Energy, and Tailan New Energy, having either initiated or completed pilot and experimental production lines between 2025 and 2026. Notably, BYD launched a 20 GWh mass production line in Chongqing in Q3 2026, aiming for integration into a small batch of vehicles by Q1 2027. CATL, meanwhile, operationalized the first phase of its solid-state battery production base in July 2026, which boasts single-cell energy densities exceeding 500 Wh/kg. Despite this rapid expansion of manufacturing capabilities, projections indicate that the utilization rate for solid-state batteries will remain low, at 1-15%, between 2026 and 2030, suggesting a potential significant mismatch between initial supply capacity and market demand.

Technical / Clinical Details

Various solid-state electrolyte materials and manufacturing processes are being tested in these newly operational pilot lines. The efforts by BYD and CATL are particularly noteworthy. BYD is building a massive 20 GWh line with a focus on large-scale production for automotive applications. CATL's achievement of over 500 Wh/kg in single-cell energy density represents a substantial leap beyond current top-tier lithium-ion batteries (around 300 Wh/kg), potentially revolutionizing EV driving ranges. These technologies are expected to contribute to enhanced battery safety, faster charging, and extended lifespan. However, the stable and cost-effective mass production of these advanced technologies is still evolving, a reality reflected in the low projected utilization rates.

Background & Context

All-solid-state batteries are anticipated as the 'holy grail' of battery technology, designed to overcome the challenges (such as thermal runaway risks and energy density limits) inherent in conventional liquid-electrolyte lithium-ion batteries. A global race is underway among major countries and corporations to develop this technology. The Chinese government has designated the development of the new energy vehicle industry as a national strategic priority, driving rapid advancements in R&D and production capacity among domestic battery manufacturers through substantial investment and support. While the successive activation of pilot lines signals progress towards practical implementation, the uncertainty of demand in the initial market phases has emerged as a new challenge.

Strategic Significance & Outlook

The rapid commissioning of solid-state battery pilot lines indicates that the technology is entering a practical implementation phase. However, the forecasted low utilization rates reflect the current stage of technological maturity, manufacturing costs, and uncertainty in initial market demand. This suggests that widespread market penetration for all-solid-state batteries will still take several years. Key factors moving forward will include standardization of technology, cost reduction through optimized manufacturing processes, and gaining consumer trust. Crucially, successful vehicle integration in close collaboration with automakers will be essential for stimulating genuine demand and market expansion. The industry will need to strategically optimize the balance between production capacity and demand as it heads towards full-scale mass production post-2030.

Source: https://news.metal.com/newscontent/104120524-solid-state-battery-capacity-part-2-pilot-lines-in-quick-succession-capacity-planning-mismatches-demand

#05 BYD Leads Solid-State Battery Race with First EV Deployment Slated for 2027, FinDreams to Begin Sulfide-Based Small-Batch Production

Published September 14, 2026 Electrek China

OVERVIEW

BYD's Executive Vice President Stella Li announced the company is leading the solid-state battery race, with plans to launch its first EV featuring the new technology in 2027. FinDreams, BYD's battery division, aims to commence small-batch production of sulfide-based solid-state batteries in 2027, transitioning to mass production by 2030. This strategy will see the technology initially deployed in BYD's high-end brands like Yangwang and Denza to absorb the higher initial costs.

IN DEPTH

Key Findings

BYD, the Chinese electric vehicle (EV) giant, has positioned itself at the forefront of solid-state battery development, announcing plans to introduce its first EV equipped with this advanced technology in 2027. This move represents a critical step towards the commercialization of next-generation battery solutions, with FinDreams, BYD's battery division, set to initiate small-batch production of sulfide-based solid-state batteries in the same year.

Technical / Clinical Details

FinDreams is focusing on sulfide-based solid-state electrolytes, known for their high ionic conductivity and mechanical stability, which offer significant potential for both increased energy density and improved safety. The company's roadmap includes commencing small-batch production in 2027 for initial validation and market testing, with an ambitious goal of achieving full mass production by 2030. This transition is expected to deliver substantially extended EV ranges, reduced charging times, and enhanced safety profiles. Initially, the technology will be integrated into BYD's premium brands, such as Yangwang and Denza, enabling the company to absorb the higher initial manufacturing costs while progressively demonstrating and integrating the technology into the market.

Background & Context

Solid-state batteries are considered a transformative technology for electric vehicles, with global automotive manufacturers and battery suppliers engaged in intense competition to bring them to market. Unlike conventional lithium-ion batteries that use liquid electrolytes, solid-state batteries employ solid electrolytes, significantly reducing the risk of thermal runaway and allowing for higher energy densities. This advancement promises to revolutionize EV performance, offering dramatically longer driving ranges and a safer, more convenient user experience. BYD's vertically integrated business model and in-house battery development capabilities provide a distinct advantage in this highly competitive arena.

Strategic Significance & Outlook

BYD's announcement of a 2027 launch for its solid-state battery EV will profoundly impact the global EV market. It signals that solid-state batteries are not a distant future technology but a tangible reality within a few years. This initiative is expected to accelerate development efforts among other automakers and battery developers worldwide, potentially catalyzing broader adoption of solid-state technology. As production costs decrease and the technology matures, solid-state batteries are poised to become a mainstream solution, redefining the performance benchmarks for electric vehicles and driving further innovation across the energy storage sector.

Source: https://electrek.co/2026/09/14/byd-leading-solid-state-battery-race-first-ev-2027/

#06 Purdue University Research Unveils Interfacial Defect Formation Mechanism in Solid-State Batteries, Earns 2026 Chorafas Award

Published September 14, 2026 Purdue University USA

OVERVIEW

Aditya Singla of Purdue University's School of Mechanical Engineering received the 2026 Dimitris N. Chorafas Foundation Award for his doctoral research on defect formation in solid-state battery electrodes. His work precisely models the formation of dendrites and voids at alkali metal anode/solid electrolyte interfaces, identifying mechanical stress in the thin interface as a primary driver. This elucidation offers critical guidelines for developing safer, high-energy-density next-generation batteries.

IN DEPTH

Key Findings

Aditya Singla from Purdue University's School of Mechanical Engineering has been honored with the 2026 Dimitris N. Chorafas Foundation Award for his pioneering doctoral research, which meticulously uncovered the mechanisms behind interfacial defect formation in solid-state batteries. His work, leveraging advanced computational modeling, specifically identified the critical role of mechanical stress at the thin interface between alkali metal anodes (such as lithium and sodium) and solid electrolytes in the genesis of performance-degrading dendrites and voids. This breakthrough provides fundamental insights essential for accelerating the development of high-energy-density and inherently safer next-generation battery technologies.

Technical / Clinical Details

Singla's research employed sophisticated computational modeling and simulation techniques to analyze atomic-level behavior at the ultrathin interface between solid-state battery electrodes and solid electrolytes. He demonstrated that the movement of lithium or sodium ions during charge-discharge cycles induces non-uniform mechanical stresses at this interface, which in turn promotes the formation of dendrites (tree-like crystalline structures) and voids (empty spaces). Dendrites are a notorious cause of internal short circuits and thermal runaway, while voids lead to increased contact resistance and capacity fade. By elucidating the role of interfacial stress, this research provides concrete design principles for mitigating these defects, thereby enhancing battery safety and cycle life.

Background & Context

All-solid-state batteries are heralded as a transformative technology, poised to surpass current lithium-ion batteries in several key metrics, including significantly higher energy density, superior safety due to non-flammable solid electrolytes, broader operating temperature ranges, and extended lifespan. However, their commercialization has been hindered by critical challenges, notably dendrite formation when using lithium metal anodes and poor contact (void formation) at the electrode/solid electrolyte interface. These defects directly lead to premature battery degradation, failure, and safety hazards. Consequently, understanding and controlling their formation mechanisms are paramount for the successful commercialization of solid-state batteries. Singla's research provides a scientific and engineering pathway toward resolving this deep-seated issue.

Strategic Significance & Outlook

The findings of this research are profoundly important for establishing design principles to develop safer and higher-energy-density lithium-ion and sodium-ion batteries. With the role of mechanical stress at the interface now clearly understood, researchers and engineers can focus on developing novel solid electrolyte materials, electrode architectures, and manufacturing processes specifically aimed at suppressing dendrite and void formation. Ultimately, these insights are expected to enhance the reliability and durability of all-solid-state batteries, accelerating their practical adoption across a wide range of applications, including electric vehicles, renewable energy storage, and portable electronic devices.

Source: https://engineering.purdue.edu/Engr/AboutUs/News/Spotlights/2026/2026-0910-purdue-engineering-aditya-singla-chorafas-award-solid-state-battery

Collected: September 18, 2026 | Automated Research System (Gemini API)

#07 Mitsui Kinzoku Partners with Factorial Energy to Scale All-Solid-State Battery Manufacturing, Leveraging Sulfide Solid Electrolytes

Published September 17, 2026 GLOBE NEWSWIRE (via Factorial Energy Inc.) USA

OVERVIEW

Factorial Energy Inc. announced a strategic partnership with Mitsui Kinzoku, a leading Japanese materials manufacturer, to industrialize Factorial's Solstice™ all-solid-state battery platform. Mitsui Kinzoku will contribute its expertise as a key producer of sulfide-based solid electrolytes and a global leader in ultra-thin copper foil. Factorial's Solstice™ platform, known for its high energy density and thermal stability, is poised for cost-effective manufacturing through its proprietary dry cathode process, aiming to accelerate market entry and adoption of solid-state batteries.

IN DEPTH

Key Findings

Factorial Energy Inc. has forged a strategic partnership with Mitsui Kinzoku Corporation, a prominent Japanese materials company, to accelerate the industrialization of Factorial's Solstice™ all-solid-state battery platform. This collaboration aims to overcome mass production challenges and establish cost-effective manufacturing processes by integrating Mitsui Kinzoku's expertise in sulfide-based solid electrolyte production and ultra-thin copper foil with Factorial's innovative solid-state battery technology. This alliance is expected to expedite the market introduction and broader adoption of all-solid-state batteries.

Technical / Clinical Details

Factorial's Solstice™ platform features all-solid-state battery technology designed for high energy density and superior thermal stability. A key differentiator is its proprietary dry cathode process, which holds the potential to significantly reduce manufacturing costs and complexity compared to traditional wet processes. Mitsui Kinzoku, a leading producer of sulfide-based solid electrolytes—a critical material influencing solid-state battery performance—will supply high-quality materials and provide its advanced manufacturing technology for ultra-thin copper foils, essential for lighter and higher-performance batteries. This collaboration promises to optimize the entire process from material supply to manufacturing, thereby accelerating the development of high-performance and scalable solid-state batteries.

Background & Context

All-solid-state batteries are heralded as a 'game-changer' for electric vehicles (EVs) and energy storage systems, promising substantial improvements in performance and safety. However, their widespread commercialization has been hindered by manufacturing complexity, high costs, and material availability issues. Partnerships between established materials manufacturers like Mitsui Kinzoku and innovative startups like Factorial are crucial for industrializing solid-state battery technology. Sulfide-based solid electrolytes, in particular, are strong candidates for next-generation solid-state batteries due to their high ionic conductivity and flexibility, making their stable supply and manufacturing expertise vital for market competitiveness.

Strategic Significance & Outlook

This strategic partnership marks a significant step for Factorial Energy in accelerating the commercialization of its Solstice™ platform and expanding its supply to various sectors, including the automotive industry. With Mitsui Kinzoku's robust manufacturing capabilities and supply chain support, Factorial will be better positioned to introduce high-quality, cost-effective solid-state batteries to the market. This collaboration is expected to further stimulate the growth of the solid-state battery market, accelerate EV adoption, and contribute to the overall evolution of energy storage technologies. It underscores that collaboration between material suppliers and battery manufacturers is key to transforming technological innovations into industrial-scale realities.

Source: https://markets.businessinsider.com/news/stocks/mitsui-kinzoku-partners-with-factorial-to-scale-all-solid-state-battery-manufacturing-1036553058

Collected: September 18, 2026 | Automated Research System (Gemini API)

#08 Graphene Oxide-Polymer Composite Electrolyte Enables Dendrite-Free All-Solid-State Lithium Batteries, Retaining 80.44% Capacity After 200 Cycles

Published September 12, 2026 Bioengineer.org (citing Ionics journal) Unknown

OVERVIEW

A new solid polymer electrolyte, combining graphene oxide (GO) and polymer (PVP-modified PEO-LiTFSI), has been introduced to enable dendrite-free all-solid-state lithium batteries. This electrolyte exhibits high lithium-ion transference numbers and good ionic conductivity, effectively suppressing lithium dendrite formation. Full-cell tests with a lithium iron phosphate cathode and lithium metal anode achieved an initial discharge capacity of 151.1 mAh/g at 0.5C and maintained 80.44% of this capacity after 200 cycles, showcasing superior stability and performance for next-generation solid-state technology.

IN DEPTH

Key Findings

New research has successfully developed a dendrite-free all-solid-state lithium battery through an innovative solid polymer electrolyte (GO/PVP-modified PEO-LiTFSI) that combines graphene oxide (GO) and a polymer. This groundbreaking electrolyte demonstrates a high lithium-ion transference number and excellent ionic conductivity, effectively suppressing lithium dendrite formation. In full-cell tests pairing it with a lithium iron phosphate cathode and a lithium metal anode, the battery achieved an impressive initial discharge capacity of 151.1 mAh/g at 0.5C and retained 80.44% of its capacity after 200 cycles, marking a significant breakthrough towards practical, safe, and high-performance next-generation solid-state batteries.

Technical / Clinical Details

The developed solid polymer electrolyte integrates graphene oxide (GO) and polyvinylpyrrolidone (PVP) into a polyethylene oxide (PEO)-based electrolyte. This GO/PVP-modified PEO-LiTFSI composite electrolyte exhibits a higher lithium-ion transference number (greater than 0.5) and superior ionic conductivity (5.6×10^{-4} S/cm at 25°C) compared to conventional liquid electrolytes. The two-dimensional structure of GO and the intermolecular interactions of PVP create uniform diffusion pathways for lithium ions, which physically and chemically inhibit the growth of dendrites. When assembled into a full solid-state cell with a lithium iron phosphate (LFP) cathode and a lithium metal anode, the battery demonstrated excellent cycle stability and high coulombic efficiency (averaging over 99%), proving its capability for practical applications.

Background & Context

All-solid-state batteries are considered prime candidates for next-generation energy storage due to their potential for significantly improved safety (eliminating flammable liquid electrolytes), higher energy density, broader operating temperature range, and extended lifespan. The lithium metal anode, with its theoretical capacity approximately ten times higher than that of conventional graphite anodes, is key to maximizing the energy density of solid-state batteries. However, a major challenge has been the growth of lithium dendrites during repeated charge-discharge cycles, which can lead to internal short circuits and battery degradation. The dendrite-free solid polymer electrolyte presented in this study offers a promising solution to this long-standing issue, significantly advancing the commercial viability of all-solid-state batteries.

Strategic Significance & Outlook

The development of this graphene oxide-polymer composite solid polymer electrolyte represents a substantial leap forward for the commercialization of high-performance and safe all-solid-state lithium metal batteries. By overcoming limitations of conventional polymer electrolytes, such as low ionic conductivity and insufficient dendrite suppression, this technology holds immense promise for a wide range of applications, including electric vehicles, portable electronic devices, and grid-scale energy storage systems. With further optimization of materials and development of scale-up manufacturing techniques, this technology has the potential to become a leading force in the next-generation battery market, redefining energy storage capabilities.

Source: https://bioengineer.org/graphene-oxide-and-polymer-pairing-paves-way-for-dendrite-free-solid-state-lithium-batteries/

#09 Purdue University Research on Solid-State Battery Interfacial Defects Wins Engineering Research Award, Providing New Guidelines for High-Energy Battery Development

Published September 16, 2026 Shanghai Metals Market (SMM) China

OVERVIEW

A research team from Purdue University's College of Engineering received an Engineering Research Award on September 14, 2026, for elucidating the formation mechanism of interfacial defects in solid-state batteries through computer modeling. This work provides crucial design guidelines for developing safer, higher-energy-density lithium-ion and sodium-ion batteries. A deeper understanding of interfacial defect mechanisms like dendrites and voids is expected to enhance the reliability and performance of next-generation battery technologies.

IN DEPTH

Key Findings

A research team from Purdue University's College of Engineering has been honored with an Engineering Research Award on September 14, 2026, for their groundbreaking work using computer modeling to elucidate the formation mechanism of interfacial defects in all-solid-state batteries. This pivotal research provides essential design guidelines for developing safer and higher-energy-density lithium-ion and sodium-ion batteries. The insights gained into how interfacial defects, particularly dendrites and voids, form are expected to significantly enhance the reliability and performance of next-generation battery technologies.

Technical / Clinical Details

The Purdue research team employed advanced computational modeling techniques to simulate the complex behavior of lithium and sodium ions at the interface between electrodes and solid electrolytes within all-solid-state batteries. Their simulations revealed how non-uniform mechanical stresses at the interface, along with specific crystallographic defects, promote the growth of dendrites (tree-like structures) and the formation of voids. Dendrites increase the risk of thermal runaway due to internal short circuits, while voids lead to increased internal resistance and degraded battery performance. By pinpointing the root causes of these interfacial defects, this study lays the foundation for devising specific strategies to mitigate these issues in future battery designs.

Background & Context

All-solid-state batteries are highly anticipated as a next-generation technology poised to surpass current lithium-ion batteries in terms of safety (due to non-flammable solid electrolytes), high energy density, wider operating temperature ranges, and extended lifespan. However, the practical application of solid-state batteries has long been hampered by the persistent problems of dendrite formation in lithium metal anodes and interfacial defects arising from poor contact between electrodes and solid electrolytes. Since these defects directly impact battery reliability, durability, and safety, understanding and controlling their formation mechanisms is paramount for the commercialization of solid-state batteries. This research represents a significant step towards finding both theoretical and practical solutions to this critical challenge.

Strategic Significance & Outlook

The findings from Purdue University's research offer clear pathways for suppressing the formation of dendrites and voids in the design and manufacturing processes of all-solid-state batteries. This will enable researchers and companies to focus on developing more stable solid electrolyte materials, improving interfacial engineering techniques, and optimizing electrode manufacturing processes. In the long term, these insights are expected to contribute to extending the range of electric vehicles, enhancing the battery life of portable electronic devices, and improving the safety and efficiency of large-scale renewable energy storage systems, thereby accelerating the transition to a clean energy society.

Source: https://news.metal.com/en/newscontent/104118053-solid-state-battery-purdue-university-research-reveals-formation-mechanism-of-interfacial-defects-in-solid-state-batteries-wins-engineering-research-award

Collected: September 18, 2026 | Automated Research System (Gemini API)

#10 Microscopic Analysis of Dendrites: eScience Review Highlights Persistent Challenges for Solid-State Batteries

Published September 16, 2026 EurekAlert! (citing eScience journal) Germany

OVERVIEW

A comprehensive review in eScience by researchers from Forschungszentrum Jülich, RWTH Aachen University (Germany), and Stanford University (USA) emphasizes that dendrite formation remains the primary obstacle preventing all-solid-state lithium metal batteries from meeting commercial expectations. The study integrates the latest microscopic evidence on how and why dendrites form at the solid electrolyte/lithium metal anode interface. Low lithium self-diffusion and interfacial defects are identified as key drivers for dendrite growth, underscoring their resolution as critical for commercial viability.

IN DEPTH

Key Findings

A comprehensive review article published in eScience by a collaborative team of researchers from Forschungszentrum Jülich, RWTH Aachen University in Germany, and Stanford University in the United States highlights that dendrite formation is the primary impediment preventing all-solid-state lithium metal batteries (ASSLMBs) from fulfilling their commercial promise, despite their high energy density, fast charging capabilities, and inherent safety. The study meticulously integrates the latest microscopic evidence to explain how and why dendrites form at the critical solid electrolyte/lithium metal anode interface, identifying low lithium self-diffusion rates and interfacial defects as key drivers of dendrite growth.

Technical / Clinical Details

The review delves into detailed analyses, utilizing data from advanced microscopy techniques and computational modeling, to examine the processes involved when lithium ions traverse the solid electrolyte and deposit onto the lithium metal anode. Dendrites are characterized as needle-like crystalline structures that form due to non-uniform lithium ion deposition, capable of penetrating the solid electrolyte, ultimately leading to internal short circuits and thermal runaway within the battery. The researchers pinpoint that solid electrolytes with low lithium self-diffusion coefficients, as well as microscopic defects and heterogeneities present at the electrode/electrolyte interface, are significant factors accelerating the nucleation and growth of these dendrites. This underscores the paramount importance of interface quality and uniform lithium ion transport for the performance and safety of all-solid-state batteries.

Background & Context

All-solid-state batteries are widely considered the most promising next-generation battery technology, offering intrinsically higher safety due to the absence of flammable liquid electrolytes and the potential for energy densities far surpassing current lithium-ion batteries. They are garnering significant interest from global automotive manufacturers and electronics companies. ASSLMBs, in particular, are seen as key to drastically extending the range of electric vehicles, owing to the high theoretical capacity of lithium metal anodes. However, dendrite formation has remained the most formidable technical barrier to the practical implementation of this technology, preventing it from realizing its full potential. This review serves to deepen the fundamental understanding of this dendrite problem, guiding future research and development efforts.

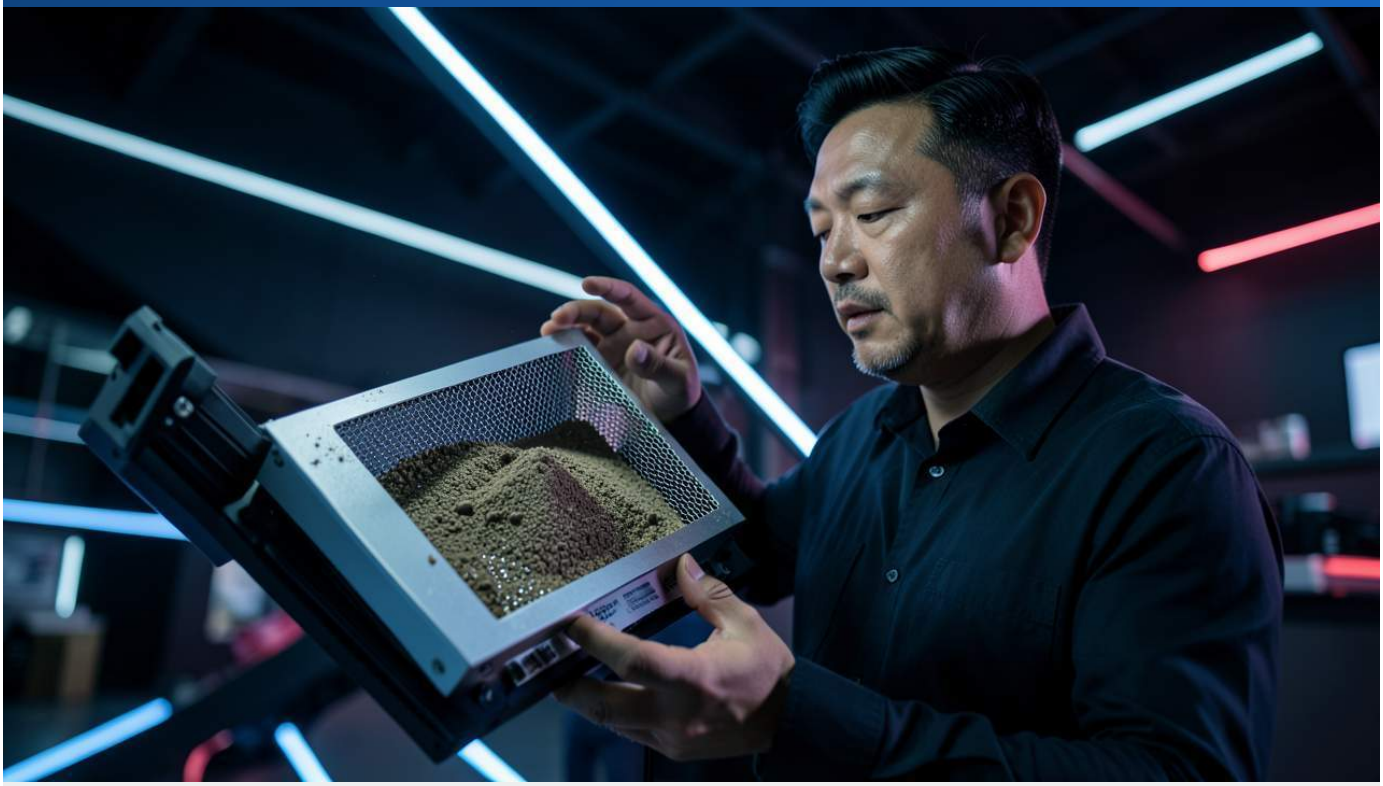
Strategic Significance & Outlook

The microscopic factors of dendrite formation identified in this review article will serve as crucial guidelines for future all-solid-state battery research. Researchers will need to focus on developing new solid electrolyte materials that enable uniform lithium ion transport, engineering approaches to optimize electrode/electrolyte interface properties, and improving manufacturing processes to mitigate dendrite growth. This deeper understanding is expected to accelerate the development of safer and higher-performance all-solid-state batteries, ultimately making their commercialization a reality across diverse applications such as electric vehicles, portable electronic devices, and large-scale energy storage systems.

Source: https://www.eurekalert.org/news-releases/1144183

#11 BYD to Launch Solid-State Battery Model in 2027: High-Cost Absorption Strategy for Yangwang and Denza

Published September 14, 2026 BigGo Finance China



OVERVIEW

BYD announced plans to introduce a model equipped with solid-state battery technology in 2027, serving as a real-world validation platform for the technology. Sun Huajun, CTO of BYD's battery division, outlined a concrete schedule, commencing batch demonstration deployments in vehicles around 2027 and transitioning to large-scale mass production post-2030. Initially, these batteries will be preferentially deployed in BYD's high-end brands like Yangwang and Denza to absorb the higher early costs associated with solid-state technology.

IN DEPTH

Key Findings

BYD, the prominent Chinese electric vehicle (EV) manufacturer, has announced its intention to introduce a model featuring solid-state battery technology to the market in 2027. This inaugural vehicle will serve as a crucial real-world validation platform for BYD's proprietary solid-state battery technology. Sun Huajun, the Chief Technology Officer of BYD's battery division, has provided a specific roadmap, indicating that batch demonstration deployments in vehicles will commence around 2027, followed by a transition to large-scale mass production post-2030.

Technical / Clinical Details

BYD's solid-state battery technology is anticipated to utilize sulfide-based solid electrolytes, which are expected to offer significant advantages in both safety and energy density compared to existing lithium-ion batteries. The initial deployment in 2027 is termed a "batch demonstration deployment" and will be prioritized for high-end models within BYD's premium brands, specifically Yangwang and Denza. This strategic approach aims to absorb the higher initial manufacturing costs associated with solid-state batteries while simultaneously gathering critical real-world driving data to mature and optimize the technology. Following this demonstration phase, and as manufacturing processes improve and costs decrease, large-scale mass production for a broader range of models is planned for after 2030.

Background & Context

Solid-state batteries are recognized globally as a potentially game-changing technology for electric vehicles, capable of dramatically extending range, shortening charging times, and reducing the risk of thermal runaway, thereby fundamentally transforming EV performance and safety. BYD, with its vertically integrated business model spanning battery development to EV manufacturing, possesses a unique advantage in managing the entire solid-state battery supply chain, enabling rapid deployment and optimization. This announcement signals that solid-state batteries are not a distant future technology but are poised to enter the market in the relatively near future, setting a significant benchmark for the industry.

Strategic Significance & Outlook

BYD's plan to launch solid-state battery-equipped EVs in 2027 is expected to intensify competition within the global EV market. The introduction of high-performance and safe solid-state batteries, particularly in premium brands, will likely raise consumer expectations and exert pressure on other automotive manufacturers to accelerate their own technological adoption. In the long term, as production costs decrease and the technology matures, solid-state batteries are anticipated to be integrated into mainstream EV models, significantly contributing to the widespread adoption of electric vehicles and further advancements in their performance. This strategy positions BYD to potentially lead the next major transformation phase in the EV market.

Source: https://finance.biggo.com/news/a0e9dd04-2c2a-4ec7-bcac-17bc24326f62

Collected: September 18, 2026 | Automated Research System (Gemini API)

#12 Factorial Energy Partners with Mitsui Kinzoku to Accelerate Industrialization of 450 Wh/kg Solstice™ Solid-State Battery Platform

Published September 17, 2026 Electrek USA

OVERVIEW

Factorial Energy announced a strategic partnership with Mitsui Kinzoku to industrialize its Solstice™ solid-state battery platform, which boasts an energy density up to 450 Wh/kg—80% higher than conventional lithium-ion batteries—and stable operation up to 90°C. This collaboration complements Factorial's existing ties with major automakers like Mercedes-Benz, Stellantis, and Hyundai, aiming to expand solid-state battery applications beyond automotive to aerospace, defense, and robotics. The partnership is expected to accelerate mass production and market penetration by integrating Mitsui Kinzoku's materials expertise with Factorial's advanced battery technology.

IN DEPTH

Key Findings

Factorial Energy, a developer of solid-state battery technology, has announced a strategic partnership with Mitsui Kinzoku, a Japanese materials company, to accelerate the industrialization of its groundbreaking Solstice™ platform. This collaboration is a pivotal step towards the mass production of solid-state batteries, leveraging Factorial's innovative battery designs and Mitsui Kinzoku's extensive expertise in advanced materials science.

Technical / Clinical Details

The Factorial Solstice™ platform is notable for its impressive performance metrics, achieving a weight energy density of up to 450 Wh/kg, which represents an approximate 80% improvement over conventional lithium-ion batteries. Furthermore, the battery demonstrates remarkable stability at temperatures up to 194°F (90°C), promising enhanced safety and reliability under demanding operating conditions. Factorial is already engaged in development partnerships with leading automotive manufacturers such as Mercedes-Benz, Stellantis, and Hyundai, and is now also planning to supply solid-state batteries for applications in aerospace, defense, and robotics, highlighting the versatility and potential of its technology.

Background & Context

Solid-state batteries are considered the next-generation power source due to their superior energy density, inherent safety, fast charging capabilities, and extended lifespan compared to traditional lithium-ion counterparts. However, challenges related to manufacturing costs and scalability have historically impeded their widespread adoption. Factorial has been making steady progress in integrating solid-state batteries into the automotive industry through its strategic alliances with major carmakers. The partnership with Mitsui Kinzoku is crucial for strengthening the supply chain, from raw materials to manufacturing processes, thereby reducing barriers to mass production and commercialization.

Strategic Significance & Outlook

This strategic alliance is expected to significantly accelerate the commercialization of Factorial Energy's Solstice™ platform and drive the adoption of solid-state batteries in the automotive market. The synergy between Mitsui Kinzoku's material expertise and Factorial's battery technology promises further enhancements in battery performance and cost reductions, which are critical for broader market penetration. Looking ahead, Factorial's technology is poised to drive innovation not only in the automotive sector but also in areas requiring stringent performance criteria such as aerospace and robotics, contributing to the electrification across diverse industries globally.

Source: https://electrek.co/2026/09/17/solid-state-battery-maker-factorial-secures-another-big-partnership/

#13 China's 15th Five-Year Plan Accelerates Solid-State Battery Industrialization; Chery Targets 2027 Vehicle Validation, Tinci Materials Operates 100-Ton Pilot Line

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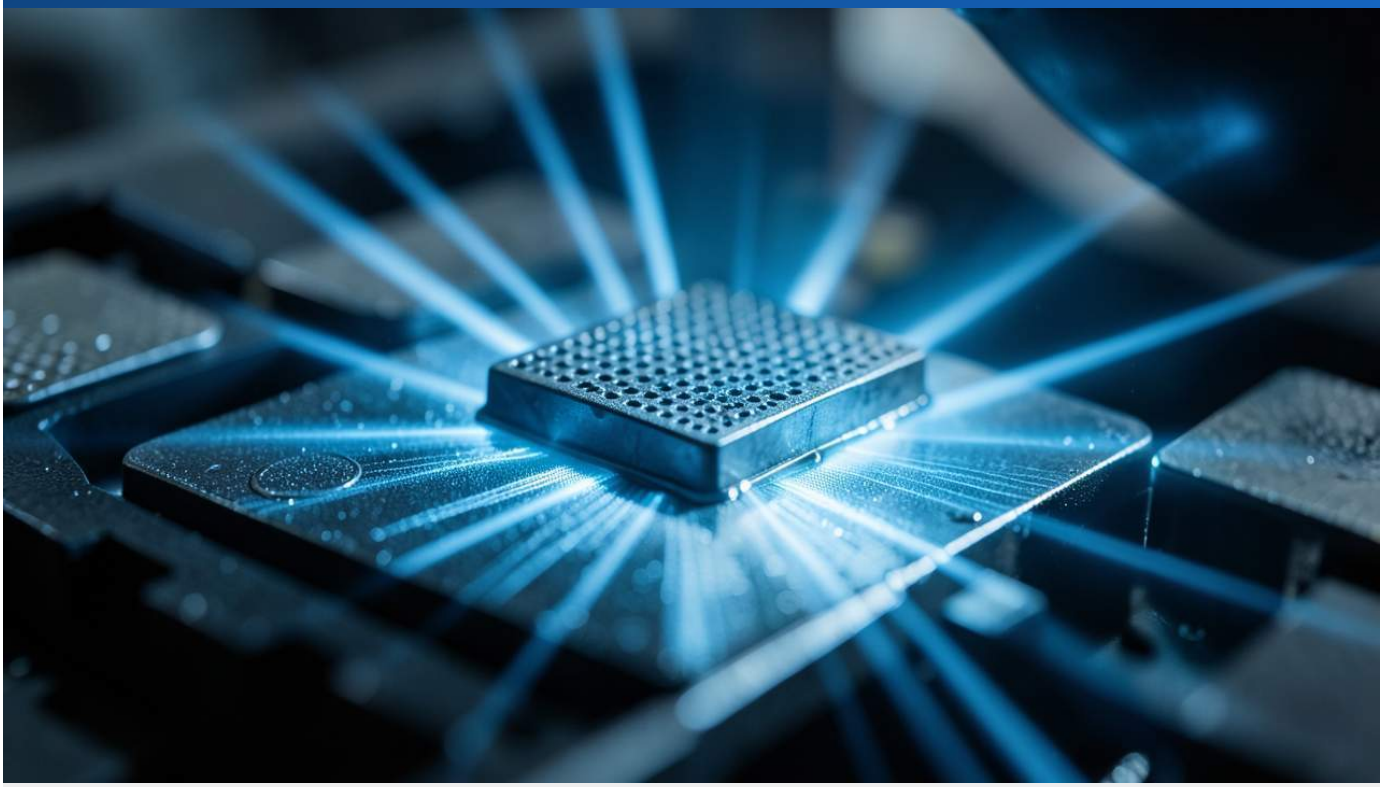

OVERVIEW

China's Ministry of Industry and Information Technology (MIIT) and National Development and Reform Commission (NDRC) announced explicit support for solid-state battery industrialization within the 15th Five-Year Plan for Electronic Information Manufacturing. Following this policy push, automaker Chery plans to integrate hybrid solid-liquid batteries into vehicles by Q4 2026 and initiate vehicle validation for full solid-state batteries in 2027. Concurrently, Tinci Materials has completed and activated a 100-ton pilot line for lithium sulfide and solid electrolytes, signaling a national-level acceleration in the practical application and mass production of solid-state battery technology in China.

IN DEPTH

Key Findings

The Chinese government has formally committed to advancing the industrialization of solid-state batteries, as outlined in the '15th Five-Year Plan for Electronic Information Manufacturing Industry' released by the Ministry of Industry and Information Technology (MIIT) and the National Development and Reform Commission (NDRC). This strong policy backing is already translating into tangible progress from domestic companies: automaker Chery expects to deploy hybrid solid-liquid batteries in vehicles by Q4 2026 and commence vehicle validation for full solid-state batteries in 2027. Furthermore, Tinci Materials, a key component supplier, has completed and commissioned a 100-ton pilot line for lithium sulfide and solid electrolytes, indicating a robust strengthening of the solid-state battery supply chain within China.

Technical / Clinical Details

Chery's introduction of hybrid solid-liquid batteries represents an interim step, aiming to bridge current lithium-ion technology with full solid-state solutions while pursuing higher energy density and improved safety. The planned 2027 vehicle validation for pure solid-state batteries will be a crucial milestone, evaluating performance, safety, and durability under real-world conditions to inform commercialization strategies. Tinci Materials' new pilot line for lithium sulfide and solid electrolytes significantly boosts the production capacity for critical solid-state battery components. Sulfide-based solid electrolytes are particularly valued for their high ionic conductivity, which is essential for achieving high power output and improving low-temperature performance in solid-state batteries.

Background & Context

Solid-state batteries are widely recognized as the leading candidate for next-generation energy storage due to their advantages over conventional liquid-electrolyte lithium-ion batteries, including reduced fire risk, higher energy density, and extended cycle life. China's inclusion of solid-state battery industrialization in its '15th Five-Year Plan' underscores the strategic importance the nation places on this technology, promising significant governmental support across research, development, mass production, and supply chain integration. In the escalating global race for vehicle electrification, China aims to establish leadership in solid-state battery technology and secure a competitive edge in both the global EV and energy storage markets.

Strategic Significance & Outlook

The combination of robust government support and concrete corporate advancements in China is set to significantly accelerate the commercialization of solid-state batteries. Chery's vehicle integration and validation, alongside Tinci Materials' increased material production capacity, will contribute to technological maturity and clearer pathways to mass production. Moving forward, China is poised to exert considerable influence on the global EV and energy storage sectors through its leadership in solid-state battery technology. This progress is expected to enable automakers to develop safer and higher-performing EVs, ultimately benefiting consumers. International battery manufacturers and automotive companies will likely need to closely monitor China's developments and adapt their own solid-state battery strategies accordingly to remain competitive.

Source: https://news.metal.com/newscontent/104122948-solid-state-battery-weekly--%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8B%E2%80%8Bindustry-deepens-technologyiteration-amid-ebb-and-flow-policy-push-intensifies

Collected: September 18, 2026 | Automated Research System (Gemini API)

#14 Samsung SDI to Invest ₩16 Trillion in Ulsan for 2027 Solid-State Battery Mass Production, Achieving 900 Wh/L with Silver-Carbon Anode-Free Design

Published September 17, 2026 Multiple sources cited in snippet South Korea

OVERVIEW

Samsung SDI announced a ₩16 trillion investment in its Ulsan plant, targeting mass production of all-solid-state batteries (ASB) by 2027. The company's ASB utilizes a sulfide-based solid electrolyte and an anode-free design with a ~5-micrometer silver-carbon (Ag-C) composite layer. This innovative approach achieves a volumetric energy density of approximately 900 Wh/L, a ~40% increase over conventional NMC cells, setting a new benchmark for battery technology. This significant investment and design innovation represent a strategic move to establish Samsung SDI's leadership in the next-generation EV battery market.

IN DEPTH

Key Findings

Samsung SDI is making a substantial commitment to the future of battery technology, announcing a ₩16 trillion (approximately $11.7 billion USD) investment in its Ulsan plant in South Korea. This investment is earmarked for the mass production of its all-solid-state batteries (ASB) by 2027. The core innovation lies in Samsung SDI's ASB design, which incorporates a sulfide-based solid electrolyte and a groundbreaking anode-free structure utilizing a thin, ~5-micrometer silver-carbon (Ag-C) composite layer. This configuration is reported to achieve a volumetric energy density of approximately 900 Wh/L, representing a significant ~40% increase compared to conventional NMC (nickel-manganese-cobalt) cells, poised to set a new performance standard in the battery industry.

Technical / Clinical Details

The sulfide-based solid electrolyte is a critical component, chosen for its high ionic conductivity and inherent stability, which are vital for solid-state battery performance. The most striking design feature is the "anode-free" architecture, where a thin, roughly 5-micrometer silver-carbon composite layer serves as the negative electrode. This eliminates the need for a traditional anode material, drastically reducing the battery's volume and weight, thereby boosting its volumetric energy density to an unprecedented 900 Wh/L. This density far surpasses current lithium-ion batteries and promises to extend EV ranges significantly while allowing for more compact battery packs and greater vehicle design flexibility. Furthermore, the solid electrolyte inherently enhances safety by mitigating risks associated with liquid electrolyte leakage and thermal runaway.

Background & Context

Solid-state batteries are at the forefront of the global race to develop next-generation energy storage solutions for electric vehicles (EVs), prized for their superior energy density, enhanced safety, and potential for faster charging and longer lifespan. Samsung SDI's monumental ₩16 trillion investment signals the company's serious intent to dominate the solid-state battery market and seize a leadership position. This strategic move intensifies competition with other major players like Toyota and BYD, who are also actively pursuing solid-state battery commercialization. With strong governmental backing for battery industrialization in South Korea, Samsung SDI's initiative is strategically aligned with national technological ambitions.

Strategic Significance & Outlook

The successful mass production of Samsung SDI's solid-state batteries by 2027 could catalyze a transformative shift in the EV market. The dramatic increase in volumetric energy density will enable smaller, lighter, and longer-range EVs, potentially accelerating consumer adoption of electric vehicles. The anode-free design with a silver-carbon composite layer could also lead to optimized material costs. Should this technology prove successful at scale, Samsung SDI would secure a commanding position in the next-generation battery market and further solidify its influence within the global EV supply chain. Other battery manufacturers and automakers will be closely observing Samsung SDI's technological advancements and production scale-up, likely prompting adjustments to their own solid-state battery development strategies to remain competitive.

Source: https://news.metal.com/en/newscontent/104120442-samsung-plans-battery-breakthrough-in-2027-is-a-silver-shock-on-the-horizon

Collected: September 18, 2026 | Automated Research System (Gemini API)

#15 German-US Collaboration Unlocks Microscopic Origins of Dendrite Formation in Solid-State Batteries via Comprehensive Review

Published September 12, 2026 AZoM Germany

OVERVIEW

A collaborative research team from Forschungszentrum Jülich, RWTH Aachen University (Germany), and Stanford University (USA) published a comprehensive review in eScience journal on the microscopic origins of dendrite formation in solid-state batteries. The review spans inorganic, polymer, and hybrid solid electrolytes, establishing key correlations between governing parameters and processes. Crucially, it elucidates how electronic conductivity within solid electrolytes creates internal pathways, causing lithium to deposit not only at electrode interfaces but also within the solid electrolyte itself. This insight provides new guidelines for material design to suppress dendrites and enhance battery stability.

IN DEPTH

Key Findings

An international collaborative research team comprising scientists from Forschungszentrum Jülich, RWTH Aachen University in Germany, and Stanford University in the United States has published a comprehensive review in the journal eScience, elucidating the microscopic origins of dendrite formation in all-solid-state batteries. This review integrates extensive research across inorganic, polymer, and hybrid solid electrolyte types, establishing critical correlations between the key parameters and processes that govern dendrite growth.

Technical / Clinical Details

The review paper emphasizes the intimate connection between dendrite formation and the electronic conductivity within the solid electrolyte, often attributed to defects or degradation. Specifically, it details a mechanism where electronic conductive channels within the solid electrolyte act as pathways not only for lithium ions but also for electrons, leading to lithium deposition (plating) not just at the electrode interfaces but also within the bulk of the solid electrolyte. This internal deposition is proposed to contribute to the initiation and acceleration of dendrite growth, ultimately leading to battery short-circuits and performance degradation. The researchers comprehensively analyze how various factors, including interfacial resistance, charge transfer mechanisms, solid electrolyte microstructure, defect density, and mechanical properties, collectively influence dendrite formation based on this key insight.

Background & Context

All-solid-state batteries hold immense promise as the next-generation power source for electric vehicles (EVs) and energy storage systems. They offer significant advantages such as higher energy density, enhanced safety due to non-flammable solid electrolytes, and extended cycle life. However, the formation of lithium dendrites remains one of the most formidable challenges hindering their commercialization. Dendrites, which grow from the lithium metal anode during charge-discharge cycles, can penetrate the solid electrolyte, causing internal short-circuits that severely compromise battery life and safety. This review represents a crucial step toward a holistic understanding of the fundamental physicochemical mechanisms behind dendrite formation, providing a scientific foundation for developing more effective suppression strategies.

Strategic Significance & Outlook

This comprehensive review paper is an invaluable resource for the solid-state battery research and development community, offering clear guidance for future material design and optimization efforts. It particularly highlights that rigorously controlling the electronic conductivity of solid electrolytes and developing materials with interfacial properties that inhibit dendrite formation will be critical areas of focus for future research. By applying these insights, the development of more stable, longer-lasting, and safer all-solid-state batteries is expected to accelerate. Ultimately, this will contribute to extended EV ranges, reduced charging times, and enhanced overall reliability of battery systems, powerfully advancing the transition towards a sustainable society.

Source: https://www.azom.com/news.aspx?newsID=65787

Collected: September 18, 2026 | Automated Research System (Gemini API)

#16 QuantumScape to Double Pilot Line Production by Year-End, Scaling Anode-Free Solid-State Battery Output for Expanding Market

Published September 16, 2026 MarketBeat USA

OVERVIEW

QuantumScape announced plans to double its pilot line production by year-end compared to Q2 2026, driven by internal operational improvements, enhanced equipment utilization, improved yields, and process maturity. The company emphasizes the structural advantages of its anode-free lithium metal solid-state batteries, which eliminate the anode to improve weight, volume, power, safety, and battery life. This ramp-up aims to meet expanding market demands and bolster the supply capacity of its next-generation battery technology.

IN DEPTH

Key Findings

QuantumScape, a leading developer of solid-state battery technology, has announced an ambitious plan to double its pilot line production volume by the end of 2026, compared to the second quarter of the same year. This significant increase in output marks a crucial milestone in the commercialization of the company's anode-free lithium metal solid-state battery technology, aimed at strengthening supply capabilities to meet an expanding market demand.

Technical / Clinical Details

QuantumScape's core innovation lies in its anode-free lithium metal solid-state battery. This technology fundamentally redefines battery design by eliminating the traditional standalone anode layer. The absence of an anode significantly reduces both the weight and volume of the battery, enabling the creation of much lighter and more compact battery packs. Furthermore, QuantumScape states that this anode-free design offers structural benefits that translate into high power performance, superior safety characteristics, and an extended battery lifespan. These advancements are expected to contribute significantly to increased electric vehicle (EV) driving ranges, faster charging times, and a reduced risk of thermal runaway. The announced production increase on the pilot line is attributed to a combination of internal operational improvements, enhanced equipment utilization, improved manufacturing yields, and increased process maturity.

Background & Context

Solid-state batteries are garnering immense attention from global automakers and battery suppliers as the next-generation solution to overcome the limitations of current lithium-ion batteries regarding energy density, safety, and charging speed. The anode-free design, in particular, is considered one of the most efficient solid-state battery structures, representing a significant technological breakthrough. QuantumScape has been aggressively pursuing the commercialization of this innovative technology, backed by investments from major automotive manufacturers. In a rapidly expanding global EV market, the stable supply of high-performance batteries is an indispensable factor for maintaining competitive advantage for automakers. This production ramp-up plan addresses this market need while demonstrating the steady progression of QuantumScape's technology towards mass production readiness.

Strategic Significance & Outlook

QuantumScape's plan to double its pilot line production is a critical step for the company to establish leadership in the emerging solid-state battery market. Expanding production capacity will accelerate the delivery of samples to customers and enable initial small-scale supply, clearly charting the path toward full commercialization. If the structural advantages of anode-free lithium metal solid-state batteries are validated and mass production scales up, the electric vehicle industry is poised for an even greater transformation. The widespread adoption of safer, longer-range, and fast-charging EVs could accelerate the consumer shift to electric mobility, contributing significantly to a sustainable transportation future. QuantumScape's technological advancements will undoubtedly continue to be a focal point for the battery and automotive industries in the coming years.

Source: https://www.marketbeat.com/instant-alerts/event-quantumscape-ramps-pilot-line-as-solid-state-battery-markets-expand-2026-09-16/

#17 Yuedong New Energy Accelerates Over RMB 12.5 Billion Project for 5 GWh/Year Semi-Solid Battery PACK Energy Storage Container Production

Published September 17, 2026 Energytrend China

OVERVIEW

Yuedong New Energy Technology (Zhejiang) Co., Ltd. is pushing forward with a large-scale project exceeding RMB 12.5 billion (approximately $1.75 billion USD) to produce and sell lithium-ion battery module assemblies and containerized energy storage systems. Upon completion, the company will have the capacity to produce 5 GWh of semi-solid battery PACK energy storage containers annually. Aiming to finish factory renovations, equipment installation, and commissioning by the end of 2026, the initiative is poised to accelerate the adoption of semi-solid battery technology in China’s energy storage market.

IN DEPTH

Key Findings

Yuedong New Energy Technology (Zhejiang) Co., Ltd. is significantly ramping up its operations with a massive project, exceeding RMB 12.5 billion (approximately $1.75 billion USD) in total investment, to manufacture and sell lithium-ion battery module assemblies and containerized energy storage systems. Upon the project's completion, the company anticipates an annual production capacity of 5 GWh of semi-solid battery PACK energy storage containers, which is expected to have a substantial impact on China's rapidly expanding energy storage market.

Technical / Clinical Details

The focus of Yuedong New Energy's production is on "semi-solid battery PACK energy storage containers." This technology represents an intermediate step between traditional liquid-electrolyte lithium-ion batteries and fully solid-state batteries. Semi-solid batteries replace a portion of the liquid electrolyte with a solid or gel-like electrolyte, aiming to improve safety and energy density while potentially reducing manufacturing costs and technical hurdles associated with full solid-state solutions. An annual production capacity of 5 GWh indicates a scale capable of addressing diverse applications, including large-scale grid energy storage systems, industrial power supplies, and rapid charging infrastructure. The plan to complete factory renovations, install production equipment, and commence trial operations by the end of 2026, with a goal of starting formal production shortly thereafter, underscores the company's aggressive approach to commercializing this technology.

Background & Context

Energy storage systems are becoming indispensable for the widespread adoption of renewable energy, grid stabilization, and peak shaving of electricity demand, leading to a global surge in demand. China, with its national strategy of aggressively promoting renewable energy, faces a growing need for high-capacity, safe, and cost-effective energy storage solutions. Semi-solid battery technology is emerging as a promising option to meet this demand, offering performance improvements over conventional batteries while circumventing some of the mass production challenges faced by fully solid-state batteries. Yuedong New Energy's substantial investment is strategically timed within this market trend and with strong governmental backing, aligning with China's broader ambition to establish international leadership in the energy storage sector.

Strategic Significance & Outlook

The commencement of Yuedong New Energy's 5 GWh annual production of semi-solid battery PACK energy storage containers marks a significant turning point for China's energy storage market. This substantial supply capability will play a crucial role in stabilizing power grids, integrating renewable energy into the national network, and enhancing industrial power efficiency. The widespread adoption of semi-solid battery technology also holds the potential to serve as an important bridge towards the full transition to solid-state batteries, influencing the future evolution of battery technologies. The success of this project is expected to catalyze further investment in semi-solid battery technologies by other companies, fostering increased competition and innovation within the energy storage industry both in China and globally.

Source: https://www.energytrend.com/news/20260917-52155.html