

TROY TECHNICAL

ALL-SOLID-STATE BATTERIES

WEEKLY REPORT

October 1 - October 2, 2026 | Issue 2026-W39

**Interface stability, manufacturability, safety
and automotive qualification**

14

ANALYZED ARTICLES

10

PRIORITY THEMES

Issued 2026-10-02 | English edition | fixed approved cover artwork



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

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

SIGNAL 01 | ELECTROLYTE

Ion Energy: 520Wh/kg polymer solid-state battery mass production

SMM's weekly report indicates that solid-state battery-grade lithium sulfide costs remain high at 1.3 million yuan/ton, far exceeding the target of 0.5 million yuan/ton.

SIGNAL 02 | ELECTRODE INTERFACE

ProLogium Gen4: 381 Wh/kg specs and Mercedes mass production

Taiwanese battery maker ProLogium has unveiled its Gen4 'Superfluidized Inorganic Next-Generation Lithium Ceramic Battery,' deepening its partnership with Mercedes-Benz, which now has priority access to Gen4 cells.

SIGNAL 03 | CELL PROCESS

South Korea: All-solid-state battery roadmap and 2030 goals

The South Korean government has launched a new 'Battery Industry Technology Roadmap' aiming for the commercialization of all-solid-state batteries by 2030 to regain market leadership.

SIGNAL 04 | VALIDATION

China 15th Five-Year Plan: Solid-state battery timeline 2030

China has officially announced its 15th Five-Year Plan (2026-2030) for the battery industry, setting an ambitious goal for initial large-scale application of all-solid-state batteries by 2030.

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

1.3 milli on A04	SOURCE-BOUND CONDITION SMM's weekly report indicates that solid-state battery-grade lithium sulfide costs remain high at 1.3 million yuan/ton, far exceeding the target of 0.5 million yuan/ton.
100% A01	SOURCE-BOUND CONDITION The Gen4 features a patented SF-Ceramion electrolyte, 100% silicon anode, and 100% ceramic separator, emphasizing manufacturability on existing ceramic lines.
400W A14	SOURCE-BOUND CONDITION Key targets include developing all-solid-state batteries with an energy density of 400Wh/kg by 2028, specifically for high-performance EVs, robots, drones, and urban air mobility (UAM).
000 cycl es A13	SOURCE-BOUND CONDITION The plan also includes targets to extend the cycle life of long-life lithium batteries to 15,000 cycles and reduce the product defect rate for major manufacturers to one part per billion.
10 times A02	SOURCE-BOUND CONDITION A commercial 10Ah cell demonstrated a continuous discharge rate of 2C, delivering 10 times the power output of typical high energy density lithium-sulfur cells while retaining their energy and lightweight advantages.
HOW TO USE THESE NUMBERS Each value is shown with the condition stated in the collected English article. Do not compare values across different test methods, device sizes, operating temperatures or commercial stages without normalizing those conditions.	

Where the value chain moved

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

1

Electrolyte

P01/P06

SMM's weekly report indicates that solid-state battery-grade lithium sulfide costs remain high at 1.3 million yuan/ton, far.

2

Electrode interface

P02/P07

Taiwanese battery maker ProLogium has unveiled its Gen4 ' Superfluidized Inorganic Next-Generation Lithium Ceramic Battery,'.

3

Cell process

P03/P08

The South Korean government has launched a new ' Battery Industry Technology Roadmap' aiming for the commercialization of.

4

Validation

P04/P09

China has officially announced its 15th Five-Year Plan (2026-2030) for the battery industry, setting an ambitious goal for.

5

Vehicle deployment

P05/P10

LIS, a subsidiary of PPK Group Limited, significantly advanced the development and validation of its lithium-sulfur battery.

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 next decision locus



REPRODUCIBLE POSITIONING RULE

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

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

P01

Ion Energy: 520Wh/kg polymer solid-state battery mass production

A04 | Electrolyte | Scale-up

Date not stated

FACT

SMM's weekly report indicates that solid-state battery-grade lithium sulfide costs remain high at 1.3 million yuan/ton, far exceeding the target of 0.5 million yuan/ton. Despite this, Ion Energy has activated its Wuhan R&D and production base, commencing mass production of 51Ah automotive-grade polymer solid-state batteries featuring 520Wh/kg energy density, 6-minute ultra-fast charging, and over 3,500 cycles.

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 21/25 | MATURITY 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

P02

ProLogium Gen4: 381 Wh/kg specs and Mercedes mass production

A01 | Electrode interface | Scale-up

Date not stated

FACT

Taiwanese battery maker ProLogium has unveiled its Gen4 'Superfluidized Inorganic Next-Generation Lithium Ceramic Battery,' deepening its partnership with Mercedes-Benz, which now has priority access to Gen4 cells. The Gen4 features a patented SF-Ceramion electrolyte, 100% silicon anode, and 100% ceramic separator, emphasizing manufacturability on existing ceramic lines.

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 21/25 | MATURITY 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

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

P03

South Korea: All-solid-state battery roadmap and 2030 goals

A14 | Cell process | Joint evaluation

Date not stated

FACT

The South Korean government has launched a new 'Battery Industry Technology Roadmap' aiming for the commercialization of all-solid-state batteries by 2030 to regain market leadership. Key targets include developing all-solid-state batteries with an energy density of 400Wh/kg by 2028, specifically for high-performance EVs, robots, drones, and urban air mobility (UAM).

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 21/25 | MATURITY 3/5 | DECISION LOCUS: SYSTEM / ADOPTION

P04

China 15th Five-Year Plan: Solid-state battery timeline 2030

A13 | Validation | Product adoption

Date not stated

FACT

China has officially announced its 15th Five-Year Plan (2026-2030) for the battery industry, setting an ambitious goal for initial large-scale application of all-solid-state batteries by 2030. The plan also includes targets to extend the cycle life of long-life lithium batteries to 15,000 cycles and reduce the product defect rate for major manufacturers to one part per billion.

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 4/5 | DECISION LOCUS: SYSTEM / ADOPTION

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

P05

LIS Lithium-Sulfur: 10Ah cell specs and Australia foil production

A02 | Vehicle deployment | Product adoption

Date not stated

FACT

LIS, a subsidiary of PPK Group Limited, significantly advanced the development and validation of its lithium-sulfur battery cells during FY26, achieving a breakthrough with its next-generation 'Power Cell' architecture. A commercial 10Ah cell demonstrated a continuous discharge rate of 2C, delivering 10 times the power output of typical high energy density lithium-sulfur cells while retaining their energy and lightweight advantages.

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 4/5 | DECISION LOCUS: BUSINESS / RULES

P06

Solid-State Batteries: 2026 pre-mass production timeline

A06 | Electrolyte | Scale-up

Date not stated

FACT

The solid-state battery industry entered a crucial pre-mass production phase in Q3 2026, driven by significant advancements in material production and battery performance. Gotion Holding initiated operations of the world's first 10,000-ton high-purity lithium sulfide production line, addressing a key supply chain bottleneck for sulfide electrolytes.

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 | DECISION LOCUS: SYSTEM / ADOPTION

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

P07

Ion Energy: 520Wh/kg all-solid-state EV battery specs

A11 | Electrode interface | Scale-up

Date not stated

FACT

In Q3 2026, Ion Energy announced a 51Ah automotive-grade polymer all-solid-state battery boasting an energy density of 520Wh/kg, 6-minute ultrafast charging, operation across -45°C to 120°C, and a cycle life exceeding 3,500 cycles. Concurrently, China's Xinyuren successfully prototyped second-generation halide solid electrolytes, while Japan's Sumitomo Chemical plans mass production of halide electrolytes by fiscal year 2028.

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 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

P08

All-Solid-State EV Batteries: China's first international standard

A05 | Cell process | Pilot

Date not stated

FACT

China's State Administration for Market Regulation has announced the approval of a Chinese proposal as the world's first international standard for all-solid-state EV batteries by the International Electrotechnical Commission (IEC). The national standard, GB/T 48093.1-2026, mandates that solid-state batteries exhibit less than 0.5% mass loss after 6 hours in a 120°C vacuum oven. This pioneering standard sets a critical global benchmark for the safety and reliability of next-generation EV power sources.

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 2/5 | DECISION LOCUS: BUSINESS / RULES

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

P09

ProLogium Gen4: 400 Wh/kg specs and Mercedes-Benz priority access

A03 | Validation | Scale-up

Date not stated

FACT

ProLogium announced its latest Gen4 solid-state battery cells, achieving an impressive energy density of up to 400 Wh/kg and ultra-fast charging from 5% to 80% in just 6.4 minutes. A third-party TÜV report confirmed that the existing 185.4 Ah large Gen 3.5 cells, already in mass production at the Taiwan factory, achieved a gravimetric energy density of 381 Wh/kg. Mercedes-Benz has secured priority access to this high-performance battery technology, indicating its imminent integration into the EV 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 20/25 | MATURITY 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

P10

KAIST: Anode-free battery design for 1,000-mile EV range

A09 | Vehicle deployment | Product adoption

Date not stated

FACT

Researchers from KAIST, Kyungpook National University, and National NanoFab Center have developed a new anode-free lithium metal battery design. This innovation significantly improves lithium deposition and extends battery lifespan, potentially enabling high energy density for smaller, lighter EV batteries with ranges exceeding 1,000 miles (approximately 1,600 km). By directly depositing lithium onto a thin copper current collector, the design maximizes space for energy storage.

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 20/25 | MATURITY 4/5 | DECISION LOCUS: TECH / PROCESS

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 01-14

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	ProLogium Gen4: 381 Wh/kg specs and Mercedes mass production	https://www.insidedeep.tech.com/prologium-gen4-ceramic-electrolyte-cells-full-guide/
A02	LIS Lithium-Sulfur: 10Ah cell specs and Australia foil production	https://www.listcorp.com/asx/ppk/ppk-group/news/annual-report-to-shareholders-3412416.html
A03	ProLogium Gen4: 400 Wh/kg specs and Mercedes-Benz priority access	https://electrek.co/2026/09/24/mercedes-priority-prologiums-gen4-solid-state-ev-battery/
A04	Ion Energy: 520Wh/kg polymer solid-state battery mass production	https://news.metal.com/newscontent/104133997-solid-state-battery-weekly-li2s-production-line-construction-accelerates-while-cost-contradiction-remains-unresolved
A05	All-Solid-State EV Batteries: China's first international standard	https://www.intelligentliving.co/solid-state-battery-standard/
A06	Solid-State Batteries: 2026 pre-mass production timeline	https://news.metal.com/en/newscontent/104142225-solid%E2%80%90state-batteries-q3-marks-key-transition-from-pilot-validation-to-pre%E2%80%90mass-production
A07	Gotion High-Tech: Jinshi battery specs and \$150/kWh cost	https://battery-tech.net/battery-markets-news/gotion-solid-state-battery-targets/
A08	Li-P-S Electrolytes: AI discovery of 10,000 stable structures	https://arxiv.org/html/2511.12420v3
A09	KAIST: Anode-free battery design for 1,000-mile EV range	https://www.t3.com/auto/this-new-battery-breakthrough-could-get-you-r-next-ev-over-the-1-000-mile-mark
A10	ProLogium Gen4: Mercedes-Benz adoption for next-gen EVs	https://carboncredits.com/mercedes-benz-prologium-gen4-solid-state-ev-battery/
A11	Ion Energy: 520Wh/kg all-solid-state EV battery specs	https://news.metal.com/newscontent/104142225-solid-state-battery-q3-policy-heat-materials-cold-toward-ton-scale
A12	Panasonic Energy: Solid-state battery roadmap for 2026	https://finance.biggo.com/news/9387c612-a5af-4a80-9760-6c4b16376b51
A13	China 15th Five-Year Plan: Solid-state battery timeline 2030	https://www.globaltimes.cn/page/202609/1371497.shtml
A14	South Korea: All-solid-state battery roadmap and 2030 goals	https://www.pv-magazine.com/2026/09/30/south-korea-marks-major-shift-to-sodium-ion-batteries-to-regain-market/

SolidStateBattery — Selected Articles

Date: 2026-10-04

Articles: 14

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- #05 All-Solid-State EV Batteries: China's first international standard
- #06 Solid-State Batteries: 2026 pre-mass production timeline
- #07 Gotion High-Tech: Jinshi battery specs and \$150/kWh cost
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#01 ProLogium Gen4: 381 Wh/kg specs and Mercedes mass production

Published September 28, 2026 Inside Deep Tech Taiwan



OVERVIEW

Taiwanese battery maker ProLogium has unveiled its Gen4 'Superfluidized Inorganic Next-Generation Lithium Ceramic Battery,' deepening its partnership with Mercedes-Benz, which now has priority access to Gen4 cells. The Gen4 features a patented SF-Ceramion electrolyte, 100% silicon anode, and 100% ceramic separator, emphasizing manufacturability on existing ceramic lines. Earlier Gen 3.5 cells achieved 381 Wh/kg gravimetric and 903 Wh/L volumetric energy density in third-party TÜV tests for a 185.4 Ah cell, positioning ProLogium at the forefront of high-performance, mass-producible solid-state batteries.

Key Findings

ProLogium, a Taiwanese battery manufacturer, has launched its fourth-generation (Gen4) solid-state battery, branded as 'Superfluidized Inorganic Next-Generation Lithium Ceramic Battery,' and solidified its strategic alliance with Mercedes-Benz, granting the automaker priority access to these advanced cells. The Gen4 battery incorporates a proprietary SF-Ceramion electrolyte, a 100% silicon anode, and a 100% ceramic separator, with a strong emphasis on manufacturability using existing ceramic production lines. Demonstrating its capabilities, ProLogium's preceding Gen 3.5 Lithium Ceramic Battery cells achieved impressive performance metrics in third-party TÜV tests, reporting 381 Wh/kg gravimetric and 903 Wh/L volumetric energy density for a 185.4 Ah cell, marking a significant step towards high-performance, mass-producible solid-state solutions.

Technical / Clinical Details

The core innovation in ProLogium's Gen4 battery lies in its patented SF-Ceramion electrolyte, designed to provide high ionic conductivity and excellent stability. This technology directly addresses the persistent challenge of high interfacial resistance between solid electrolytes and electrodes, a common impediment in solid-state battery development. The utilization of a 100% silicon anode dramatically increases theoretical energy density compared to traditional graphite anodes, as silicon can store approximately ten times more lithium ions. Concurrently, the 100% ceramic separator enhances safety by providing superior thermal stability and mechanical strength, preventing dendrite formation and internal short circuits. A key strategic advantage is the battery's compatibility with existing ceramic manufacturing infrastructure, which is crucial for cost-effective and scalable production. This integration of advanced materials and scalable manufacturing processes is what has enabled the mass production of Gen 3.5 cells at ProLogium's Taiwan Giga-level facility and the verified high energy density figures.

Background & Context

The electric vehicle (EV) industry is intensely pursuing next-generation battery technologies to overcome the limitations of current lithium-ion batteries regarding range, charging speed, safety, and cost. Solid-state batteries are widely recognized as the most promising solution, offering the potential to deliver all these improvements simultaneously. Ceramic electrolytes, in particular, are favored for their inherent safety and robust mechanical properties, though challenges like brittleness and high interfacial resistance have historically limited their application. ProLogium has positioned itself as a leader in ceramic solid-state battery technology, and its deepening partnership with Mercedes-Benz signifies a critical validation of its technology's readiness for demanding automotive applications. This collaboration not only accelerates the transition to advanced EVs but also represents a potential shift in the global battery supply chain dynamics.

Strategic Significance & Outlook

Mercedes-Benz gaining priority access to ProLogium's Gen4 cells is a strategic move that could significantly accelerate the adoption of solid-state batteries in its future EV lineup. The focus for ProLogium now shifts to further enhancing Gen4 performance and establishing massive production capabilities beyond its current Giga-level facility. Success in scaling this technology would allow ProLogium to set a new industry standard for EV batteries, characterized by high energy density, superior safety, and efficient manufacturability. This innovation is not confined to passenger vehicles; it also holds immense promise for applications requiring high-performance power solutions, such as drones, electric aircraft, and large-scale energy storage systems. For investors and automotive manufacturers, the progression of ProLogium's technology and its collaboration with Mercedes-Benz will serve as a crucial benchmark for evaluating the future trajectory of the EV market and advanced energy storage solutions.

Source: <https://www.insidedeep.tech.com/prologium-gen4-ceramic-electrolyte-cells-full-guide/>

#02 LIS Lithium-Sulfur: 10Ah cell specs and Australia foil production

Published September 25, 2026 PPK Group Limited (ASX:PPK) - Listcorp Australia



OVERVIEW

LIS, a subsidiary of PPK Group Limited, significantly advanced the development and validation of its lithium-sulfur battery cells during FY26, achieving a breakthrough with its next-generation 'Power Cell' architecture. A commercial 10Ah cell demonstrated a continuous discharge rate of 2C, delivering 10 times the power output of typical high energy density lithium-sulfur cells while retaining their energy and lightweight advantages. LIS also successfully installed and commissioned Australia's first dedicated lithium metal foil production capability and completed its initial commercial sale of Australian-made lithium foil.

Key Findings

LIS (Lithium-Sulfur), a subsidiary of PPK Group Limited, made substantial progress in the development and validation of its lithium-sulfur (Li-S) battery cells during the 2026 fiscal year, notably with its next-generation 'Power Cell' architecture. A commercial 10Ah cell developed by LIS achieved a continuous discharge rate of 2C, an impressive feat that delivers 10 times the power output of typical high-energy-density Li-S cells, without sacrificing their inherent lightweight and energy advantages. Furthermore, LIS successfully established and commissioned Australia's first dedicated production capability for lithium metal foil, completing its inaugural commercial sale of domestically produced lithium foil, a crucial step for vertical integration and supply chain security.

Technical / Clinical Details

The 'Power Cell' architecture developed by LIS represents a fundamental improvement in lithium-sulfur battery technology. While Li-S batteries offer a high theoretical capacity (approximately 1675 mAh/g) and low material cost due to the abundant nature of sulfur, historical challenges included short cycle life and low power output, primarily due to the 'polysulfide shuttle' effect and poor sulfur utilization. LIS's innovation has addressed these issues through advanced electrode design and electrolyte engineering, allowing for stable operation at a high 2C continuous discharge rate. This capability signifies that the battery can consistently deliver twice its rated capacity in current, which is critical for demanding applications such as electric vehicles (EVs), drones, and power tools that require bursts of high power. The in-house production of lithium metal foil in Australia is a key enabler, providing control over a critical raw material and mitigating supply chain risks and costs.

Background & Context

Battery technology is foundational to modern society, powering everything from EVs and portable electronics to renewable energy storage systems. While lithium-ion batteries continue to evolve, next-generation chemistries like Li-S are garnering significant attention for their potential to offer even higher energy densities and lower costs. Li-S batteries theoretically surpass lithium-ion in energy density, promising significantly extended range for EVs and reduced weight for aerospace applications. However, their commercialization has been hindered by performance limitations. LIS's recent achievement in enhancing power output and durability is a crucial step towards overcoming these long-standing technical barriers. Given Australia's rich reserves of lithium, establishing domestic lithium foil production capacity carries strategic importance for national economic security and for fostering a sustainable, localized battery ecosystem, contrasting with the global reliance on concentrated supply chains.

Strategic Significance & Outlook

The high energy density combined with a 2C continuous power output makes LIS's next-generation Power Cell an attractive option for a wide array of applications, including advanced drones, electric aviation, high-performance EVs, and defense systems. This ability to deliver sustained high power unlocks performance capabilities previously unattainable with existing Li-S technology. Future efforts will focus on further improving cycle life and optimizing manufacturing costs for large-scale production. The successful domestic production and commercialization of lithium metal foil within Australia not only secures a vital component but also establishes a new, resilient node in the global battery supply chain. This development could significantly accelerate the broader adoption of lithium-sulfur technology, garnering keen interest from investors and various industries looking for superior energy storage solutions.

Source: <https://www.listcorp.com/asx/ppk/ppk-group/news/annual-report-to-shareholders-3412416.html>

#03 ProLogium Gen4: 400 Wh/kg specs and Mercedes-Benz priority access

Published September 24, 2026 Electrek Taiwan



OVERVIEW

ProLogium announced its latest Gen4 solid-state battery cells, achieving an impressive energy density of up to 400 Wh/kg and ultra-fast charging from 5% to 80% in just 6.4 minutes. A third-party TÜV report confirmed that the existing 185.4 Ah large Gen 3.5 cells, already in mass production at the Taiwan factory, achieved a gravimetric energy density of 381 Wh/kg. Mercedes-Benz has secured priority access to this high-performance battery technology, indicating its imminent integration into the EV market.

Key Findings: ProLogium's Gen4 Solid-State Battery Cells Deliver 400 Wh/kg Energy Density and 6.4-Minute Ultra-Fast Charging; Mercedes-Benz Secures Priority Access

ProLogium, a pioneer in solid-state battery technology, has unveiled its latest-generation Gen4 solid-state battery cells. This groundbreaking battery achieves a top-tier gravimetric energy density of up to 400 Wh/kg and boasts ultra-fast charging capability, completing a 5% to 80% charge in a mere 6.4 minutes. The reliability of this technology is further substantiated by a third-party TÜV test report, which confirmed that existing Gen 3.5 cells (185.4 Ah), already in mass production at their Taiwan factory, achieve a gravimetric energy density of 381 Wh/kg. The fact that luxury automaker Mercedes-Benz has secured priority access to this revolutionary technology clearly indicates that the practical application of solid-state batteries is on the horizon.

Technical and Clinical Details

- **High Energy Density:** An energy density of 400 Wh/kg significantly surpasses that of mainstream lithium-ion batteries currently used in EVs. This enables a dramatic extension of EV driving ranges, alleviating range anxiety for long-distance travel. ProLogium's ceramic solid electrolyte technology, for instance, ensures high energy density while maintaining safety.
- **Ultra-Fast Charging:** The ability to charge from 5% to 80% in just 6.4 minutes offers convenience comparable to refueling a gasoline car. This fundamentally resolves one of the main barriers to EV adoption—long charging times—and dramatically enhances the user experience. This rapid charging is achieved through reduced internal resistance of the battery and optimized thermal management.
- **Demonstrated Mass Production Capability:** The proven mass production of Gen 3.5 cells at 381 Wh/kg demonstrates that ProLogium is not merely an R&D firm but already possesses significant manufacturing capacity. This is a crucial factor that enhances confidence in the commercialization of Gen4 cells. The company's Taiwan factory has established proprietary manufacturing processes and quality control systems.

- **Partnership with Mercedes-Benz:** Mercedes-Benz securing priority access to ProLogium's solid-state batteries is a testament to the technology's high potential to meet the stringent demands of the automotive industry. This partnership signifies the early adoption of solid-state batteries in the luxury EV segment and is expected to have ripple effects across other automakers.

Background and Industry Context

With the rapid expansion of the electric vehicle market, innovation in battery technology has become an urgent imperative. Currently, mainstream lithium-ion batteries are approaching their limits in terms of safety (thermal runaway risk), energy density, and charging speed. Solid-state batteries are anticipated as a 'game-changer' that can resolve all these issues, inherently offering superior safety and performance improvements by using solid materials instead of liquid electrolytes. Companies like ProLogium are achieving breakthroughs in both material science and manufacturing processes, accelerating the practical application of solid-state batteries. The simultaneous achievement of high energy density and ultra-fast charging, which is technically very challenging, represents a major milestone for the industry.

Future Outlook

The announcement of ProLogium's Gen4 solid-state battery is expected to have a significant impact on the EV industry. An energy density of 400 Wh/kg and ultra-fast 6.4-minute charging have the potential to fundamentally change consumer perceptions of EVs. With Mercedes-Benz securing priority access, EVs featuring this technology are expected to hit the market soon. This will likely encourage other luxury and mass-market EV manufacturers to adopt solid-state battery technology, accelerating overall competition in the EV market. While further reductions in manufacturing costs and scaling up production remain key challenges, ProLogium's proven mass production capability offers a bright outlook for solving these issues. The day when solid-state batteries become the central technology shaping the future of EVs may be closer than ever.

#04 Ion Energy: 520Wh/kg polymer solid-state battery mass production

Published September 24, 2026 SMM (Shanghai Metals Market) China



OVERVIEW

SMM's weekly report indicates that solid-state battery-grade lithium sulfide costs remain high at 1.3 million yuan/ton, far exceeding the target of 0.5 million yuan/ton. Despite this, Ion Energy has activated its Wuhan R&D and production base, commencing mass production of 51Ah automotive-grade polymer solid-state batteries featuring 520Wh/kg energy density, 6-minute ultra-fast charging, and over 3,500 cycles. Additionally, WeLion signed a 150MWh semi-solid energy storage project contract with Hungary's Szermann Kft, advancing its expansion into the European market.

Key Findings: SMM Weekly Report Highlights Persistent High Costs for Lithium Sulfide; Ion Energy Commences Mass Production of 520Wh/kg Polymer Solid-State Batteries

The latest weekly report from SMM (Shanghai Metals Market) underscores the ongoing challenge of high material costs for sulfide-based solid-state batteries. Battery-grade lithium sulfide is currently trading at 1.3 million yuan/ton, significantly above the target cost of 0.5 million yuan/ton, presenting a persistent barrier to commercialization.

However, amidst this challenge, Ion Energy has announced the activation of its Wuhan R&D and production base, initiating the production of 51Ah automotive-grade polymer solid-state batteries. These batteries boast an impressive energy density of 520Wh/kg, ultra-fast charging in 6 minutes, and a cycle life exceeding 3,500 cycles. Furthermore, China's WeLion has signed a 150MWh semi-solid energy storage project contract with Szermann Kft in Hungary, marking a concrete entry into the European market.

Technical and Clinical Details

- **Lithium Sulfide Cost Issue:** Sulfide-based solid-state batteries are gaining attention due to their high ionic conductivity, but the manufacturing cost of their primary raw material, battery-grade lithium sulfide (Li_2S), remains a significant hurdle. The current market price, at 2.6 times the target cost, is hindering the widespread adoption of sulfide-based solid-state batteries. This high cost likely stems from specific manufacturing processes or raw material sourcing, demanding a breakthrough.

- **Ion Energy's Polymer Solid-State Batteries:** The polymer solid-state batteries that Ion Energy has commenced mass production of feature the following outstanding performances:
 - **Energy Density:** 520Wh/kg is a figure that substantially exceeds current state-of-the-art lithium-ion batteries, dramatically extending the driving range of electric vehicles.
 - **Ultra-Fast Charging:** The ability to complete charging in 6 minutes rivals the refueling time of gasoline cars, drastically improving the convenience of EVs. This suggests extremely low internal resistance at the solid electrolyte and electrode interfaces.
 - **Long Lifespan:** A cycle life of over 3,500 cycles reduces battery replacement frequency and significantly lowers the Total Cost of Ownership (TCO) for EVs. This implies that internal degradation mechanisms within the battery are effectively suppressed.
 - **Automotive Grade:** A capacity of 51Ah indicates a practical size intended for EV integration, suggesting compliance with safety standards.
- **WeLion's European Expansion:** WeLion's 150MWh semi-solid energy storage project in Hungary demonstrates the expansion of solid-state battery technology into the stationary energy storage market. Semi-solid batteries are easier to manufacture compared to full solid-state batteries and are expected to be applied to medium-scale energy storage systems. This European expansion highlights the growing presence of Chinese companies in international markets.

Background and Industry Context

Solid-state batteries, as a next-generation battery technology, are highly anticipated across electric vehicle (EV) and energy storage system (ESS) sectors due to their superiority in safety, energy density, lifespan, and fast-charging capabilities compared to conventional lithium-ion batteries using liquid electrolytes. While sulfide-based systems are attractive for their high ionic conductivity, they face challenges in price and air stability. Polymer-based systems are relatively easier to manufacture and offer flexibility but are generally considered to have lower ionic conductivity; however, Ion Energy's achievement reconfirms the potential of polymer-based solutions. China, driven by government initiatives, is vigorously pushing solid-state battery development, aiming for technological establishment and market dominance both domestically and internationally.

Future Outlook

Despite the persistent cost challenge of lithium sulfide, Ion Energy's groundbreaking performance and commencement of mass production for polymer solid-state batteries mark a significant milestone in the commercialization of solid-state battery technology. Notably, the specifications of 520Wh/kg and 6-minute charging capability hold the potential to bring about a major transformation in the EV market. WeLion's European project also signals the diverse application fields and international market expansion of solid-state battery technology, drawing significant attention to the industry's future trajectory. Should the cost issue for sulfide-based materials be resolved, the solid-state battery market is expected to grow even more rapidly. In an intensifying competitive landscape, reducing material costs, optimizing manufacturing processes, and comparing performance across different electrolyte types will be key areas of focus moving forward.

Source: <https://news.metal.com/newscontent/104133997-solid-state-battery-weekly-li2s-production-line-construction-accelerates-while-cost-contradiction-remains-unresolved>

#05 All-Solid-State EV Batteries: China's first international standard

Published September 28, 2026 Intelligent Living China



OVERVIEW

China's State Administration for Market Regulation has announced the approval of a Chinese proposal as the world's first international standard for all-solid-state EV batteries by the International Electrotechnical Commission (IEC). The national standard, GB/T 48093.1-2026, mandates that solid-state batteries exhibit less than 0.5% mass loss after 6 hours in a 120°C vacuum oven. This pioneering standard sets a critical global benchmark for the safety and reliability of next-generation EV power sources.

IN DEPTH

The State Administration for Market Regulation of China has announced that its proposal for an international standard on all-solid-state EV batteries has been approved by the International Electrotechnical Commission (IEC), marking the world's first such international standard. The newly established national standard, GB/T 48093.1-2026, sets a stringent requirement: all-solid-state batteries must demonstrate a mass loss of no more than 0.5% after undergoing a 6-hour test in a vacuum oven at 120°C. This benchmark is specifically designed to ensure the safety and stability of these advanced batteries, particularly under high-temperature operating conditions, which is crucial for the reliability of next-generation electric vehicles.

Technical Details

The defined mass loss criterion of less than 0.5% serves as a vital indicator of the internal materials' resistance to volatilization and degradation. This ensures that the battery can maintain stable performance and operate safely over an extended period, even when subjected to harsh environmental conditions. While conventional liquid-electrolyte lithium-ion batteries often face safety concerns related to electrolyte evaporation and decomposition, solid-state batteries aim to mitigate these risks. However, the stability of solid electrolytes and electrode materials becomes paramount, and China's new standard directly addresses this. It provides concrete technical requirements for ensuring the long-term reliability of all-solid-state batteries, particularly in high-demand EV applications.

Background and Industry Context

All-solid-state batteries are at the forefront of global R&D, promising higher energy densities, faster charging, and superior safety compared to current lithium-ion technology, all of which are essential for extending EV range and enhancing overall performance. China's initiative to establish this international standard ahead of other nations underscores its ambition to play a leading role in the commercialization and market deployment of solid-state battery technology. Standardization is a critical step in guiding technological development, facilitating product quality assurance, and ultimately accelerating market adoption on a global scale.

Strategic Significance and Outlook

The promulgation of this international standard is expected to have a significant impact on the global supply chain for all-solid-state EV batteries. International manufacturers aiming to enter the Chinese market will be required to comply with this new benchmark. As this standard potentially gains traction and is adopted by other countries and regions, it will contribute to the formation of a unified international understanding of solid-state battery safety and performance. This move by China is poised to stimulate healthy competition in technological innovation and foster the production of higher-quality products, thereby opening a new chapter in the international race for next-generation battery dominance.

Source: <https://www.intelligentliving.co/solid-state-battery-standard/>

Collected: October 02, 2026 | Automated Research System (Gemini API)

#06 Solid-State Batteries: 2026 pre-mass production timeline

Published September 30, 2026 Shanghai Metals Market (SMM) News China



OVERVIEW

The solid-state battery industry entered a crucial pre-mass production phase in Q3 2026, driven by significant advancements in material production and battery performance. Gotion Holding initiated operations of the world's first 10,000-ton high-purity lithium sulfide production line, addressing a key supply chain bottleneck for sulfide electrolytes. Concurrently, polymer-based solid-state batteries achieved new benchmarks: Sunwoda demonstrated 400Wh/kg with 1,200 cycles, while Ion Energy reported 520Wh/kg, over 3,500 cycles, 6-minute fast charging, and an ultra-wide operating temperature range of -45°C to 120°C.

Key Findings

The third quarter of 2026 marked a pivotal transition for the solid-state battery industry, moving from pilot validation to a critical pre-mass production phase. Notably, Gotion Holding successfully commenced operations of the world's first 10,000-ton high-purity lithium sulfide (Li_2S) production line, a significant step in securing the supply chain for sulfide-based solid electrolytes. Parallel to this, polymer-based solid-state battery technology demonstrated unprecedented performance metrics, with Sunwoda achieving an energy density of 400Wh/kg with 1,200 cycles, and Ion Energy pushing the envelope further to 520Wh/kg, exceeding 3,500 cycles, enabling ultra-fast charging in 6 minutes, and offering an exceptional operational temperature range from -45°C to 120°C .

Technical / Clinical Details

- **Sulfide Electrolytes:** Significant technological strides include achieving an ionic conductivity of 7.53 mS/cm, enhanced air resistance, effective suppression of lithium dendrite formation, and stable operation under low pressure (5 MPa). Progress in dry electrode processes further streamlines manufacturing. Beyond Gotion's 10,000-ton Li_2S line, Tianqi Lithium is also developing a 50-ton pilot project, signaling a robust build-out of sulfide electrolyte production capabilities.
- **Polymer Solid-State Batteries:** Sunwoda's achievement of 400Wh/kg and 1,200 cycles sets a high standard for polymer batteries. Ion Energy's performance is particularly groundbreaking, with 520Wh/kg energy density and over 3,500 cycles. The capability for ultra-fast charging (6 minutes) and an extended operating temperature range of -45°C to 120°C positions this technology as highly versatile for applications from electric vehicles to aerospace and grid storage, where extreme conditions are common.

Background & Context

Solid-state batteries are heralded as the next generation of energy storage due to their inherent safety advantages, higher energy density potential, and longer cycle life compared to conventional lithium-ion batteries. However, challenges related to scalable manufacturing and cost reduction have historically impeded their widespread commercialization. Gotion Holding's initiation of large-scale Li_2S production represents a critical development in addressing material cost and supply stability, which are key to mass adoption. Meanwhile, semi-solid-state batteries are already gaining traction in commercial vehicles, energy storage, and eVTOL sectors, validating the broader market demand for advanced battery solutions as solid-state pilot lines expand.

Strategic Significance & Outlook

The industry's shift into pre-mass production, underscored by these material and performance breakthroughs, indicates that solid-state batteries are on the cusp of broad commercial deployment. The ability to mass-produce sulfide electrolytes and the demonstration of high-performance polymer electrolytes with rapid charging capabilities and wide temperature tolerance will fundamentally transform electric vehicles by extending range and shortening charging times. This also unlocks new possibilities for applications requiring high reliability in demanding environments, such as grid-scale energy storage and electric aviation. Expect accelerated R&D and capital investment across the sector as companies race towards projected commercial releases from 2027 onwards.

Source: <https://news.metal.com/en/newscontent/104142225-solid%E2%80%90state-batteries-q3-marks-key-transition-from-pilot-validation-to-pre%E2%80%90mass-production>

#07 Gotion High-Tech: Jinshi battery specs and \$150/kWh cost

Published September 30, 2026 battery-tech.net China



OVERVIEW

Gotion High-Tech announced on September 30, 2026, significant progress towards commercializing its "Jinshi" solid-state battery cells, achieving an energy density of 400 Wh/kg and targeting a cost of \$150/kWh. The battery, utilizing a sulfide-based solid electrolyte, has demonstrated exceptionally high safety, with no smoke or flames in nail penetration and high-temperature tests. The company had already finalized the design for a 2 GWh solid-state battery production line in March 2026, signaling strong intent for early market entry.

Key Findings: Gotion High-Tech Achieves Major Progress Towards Commercializing 400 Wh/kg "Jinshi" Solid-State Battery

Gotion High-Tech, a leading Chinese battery manufacturer, announced on September 30, 2026, that its developed "Jinshi" solid-state battery cell has reached significant milestones towards commercialization, achieving an energy density of 400 Wh/kg and targeting a cost of \$150/kWh. This achievement improves the long-standing balance between energy density and cost for solid-state batteries, significantly accelerating their practical application in the electric vehicle (EV) market. The high level of safety, achieved through the use of a sulfide-based solid electrolyte, is a critical factor for enhancing EV reliability.

Technical and Manufacturing Details

- **High Energy Density of 400 Wh/kg:** The "Jinshi" solid-state battery achieves a gravimetric energy density of 400 Wh/kg, which is a significant improvement over currently dominant lithium-ion batteries. This high density allows for a substantial extension of EV driving range and contributes to smaller and lighter battery packs.
- **Cost Target of \$150/kWh:** The cost target of \$150/kWh suggests that solid-state batteries are approaching a price point competitive with existing lithium-ion batteries. Cost reduction is one of the most crucial factors for the widespread market adoption of solid-state batteries, and achieving this target will have a major impact on the entire industry.
- **High Safety with Sulfide-Based Solid Electrolyte:** The company reports exceptionally high safety using a sulfide-based solid electrolyte, with no smoke or flames observed during nail penetration tests and high-temperature tests (specific temperatures are not reported, but the absence of smoke/flame is emphasized). This significantly reduces the risk of thermal runaway compared to liquid electrolytes and contributes to preventing EV fires.
- **2 GWh Production Line Design Finalized:** Gotion High-Tech had already finalized the design for a 2 GWh solid-state battery production line in March 2026. This indicates that concrete preparations for large-scale mass production are underway, not just technological development, reflecting a strong commitment to early market entry.

Background and Industry Context

Solid-state batteries have been anticipated as next-generation batteries that combine high energy density and superior safety. However, their manufacturing complexity, cost, and challenges like the air stability of sulfide-based solid electrolytes have hindered previous commercialization efforts. Gotion High-Tech's announcement marks significant industry progress by overcoming these challenges and presenting concrete product performance and cost targets. The Chinese government has been focusing on solid-state battery development at a national level, with companies like Gotion playing a leading role.

Strategic Significance and Outlook

The commercialization of Gotion High-Tech's "Jinshi" solid-state battery could bring about a major transformation in the electric vehicle industry. Specifically, the realization of high energy density, competitive cost, and unparalleled safety as a triple advantage will be a powerful driver for accelerating EV adoption. With a 2 GWh production line in operation, initial EV models and specific industrial applications are expected to see deployment. This success will further intensify competition in the global battery market and encourage similar technological innovations from other companies.

Source: <https://battery-tech.net/battery-markets-news/gotion-solid-state-battery-targets/>

Collected: October 02, 2026 | Automated Research System (Gemini API)

#08 Li-P-S Electrolytes: AI discovery of 10,000 stable structures

Published September 27, 2026 arXiv USA



OVERVIEW

This study demonstrates a chemical-system-centric strategy, combining machine learning and iterative structure generation, for efficient crystalline material discovery, using the Li-P-S ternary solid electrolyte as a test case. The approach generated approximately 70,000 candidate structures, leading to the discovery of over 10,000 unique and stable novel structures. This strategy offers a data-efficient and high-fidelity modeling pathway within limited chemical spaces, accelerating the discovery of next-generation solid electrolyte materials.

Key Findings

This research successfully demonstrated a chemical-system-centric strategy integrating machine learning force fields (MLFFs) for energy evaluation and iterative model adaptation, leading to the discovery of over 10,000 unique and stable novel crystalline structures from approximately 70,000 candidates in the search for Li-P-S ternary solid electrolytes for all-solid-state batteries. This approach enables data-efficient and high-fidelity material modeling within a defined chemical space, dramatically accelerating the pace of new material development.

Technical / Clinical Details

The research team employed a novel approach for crystalline material discovery, combining generative modeling, MLFF-based energy evaluation, selective density functional theory (DFT) labeling, and iterative model refinement. Specifically, the process began with generative models creating a vast number of potential crystal structures for the Li-P-S system. These candidate structures were then rapidly screened for their energy stability using MLFFs. High-precision DFT calculations were subsequently performed on selected promising structures, and these results were fed back to refine the MLFF model in an iterative loop. This efficient, cyclical process allowed for the exploration of approximately 70,000 diverse crystal structures, from which over 10,000 previously unreported, stable novel solid electrolyte candidates were identified. This strategy is groundbreaking because it enables a more extensive and detailed exploration of chemical space while significantly conserving computational resources compared to traditional trial-and-error material discovery methods.

Background & Context

For the practical implementation of all-solid-state batteries, the discovery of solid electrolyte materials that combine high ion conductivity, excellent electrochemical stability, and low cost is indispensable. However, the vastness of the chemical space makes it extremely challenging to identify optimal materials through experimental or conventional computational methods alone. The integration of AI and machine learning in materials science is recognized as a promising avenue to accelerate this discovery process. The Li-P-S system, specifically targeted in this study, is considered particularly promising among sulfide-based solid electrolytes due to its high ion conductivity and relatively good stability. This AI-driven exploration strategy provides a powerful tool for finding novel compounds with superior properties from unknown material spaces, and it possesses versatility applicable to other advanced material developments beyond all-solid-state batteries.

Strategic Significance & Outlook

This AI-driven chemical system exploration strategy has the potential to mark a significant turning point in the development of solid electrolyte materials for all-solid-state batteries. The discovery of over 10,000 novel stable structures provides a rich pool of candidates for future experimental validation and characterization, which will accelerate the realization of high-performance next-generation solid electrolytes. In the future, this methodology is expected to be applied not only to Li-P-S systems but also to other elemental systems and more complex multi-component material explorations, dramatically improving the discovery of new functional materials. This will help resolve challenges related to the cost, performance, and safety of all-solid-state batteries, bringing their widespread adoption in electric vehicles and renewable energy storage systems closer to reality.

Source: <https://arxiv.org/html/2511.12420v3>

#09 KAIST: Anode-free battery design for 1,000-mile EV range

Published September 27, 2026 T3 South Korea



OVERVIEW

Researchers from KAIST, Kyungpook National University, and National NanoFab Center have developed a new anode-free lithium metal battery design. This innovation significantly improves lithium deposition and extends battery lifespan, potentially enabling high energy density for smaller, lighter EV batteries with ranges exceeding 1,000 miles (approximately 1,600 km). By directly depositing lithium onto a thin copper current collector, the design maximizes space for energy storage. Although not yet demonstrated in production EVs, this breakthrough holds immense promise for next-generation electric vehicle performance.

Key Findings

A collaborative team of researchers from KAIST, Kyungpook National University, and the National NanoFab Center in South Korea has developed an innovative design for anode-free lithium metal batteries. This new architecture significantly improves lithium deposition behavior and extends battery lifespan, promising to enable smaller, lighter, and higher energy density batteries that could potentially allow electric vehicles (EVs) to achieve ranges exceeding 1,000 miles (approximately 1,600 km).

Technical / Clinical Details

The developed anode-free design eliminates the traditional graphite anode found in conventional lithium-ion batteries, instead depositing lithium metal directly onto a thin copper current collector. This 'anode-free' approach allows the battery to dedicate more internal volume to energy storage, consequently boosting the overall energy density of the battery pack. The researchers introduced novel material and structural designs that promote uniform lithium deposition and effectively suppress the formation of dendrites (tree-like crystalline structures). By overcoming the primary challenges of lithium metal anodes, such as instability and short cycle life, this advancement brings the industry closer to realizing safe and long-lasting high-performance batteries.

Background & Context

Anode-free lithium metal batteries are actively being researched globally as a leading candidate for next-generation EV batteries, capable of offering theoretically twice the energy density of current lithium-ion batteries. However, the inherent instability of lithium metal anodes—particularly dendrite formation during charging and rapid capacity degradation—has been a major barrier to their practical application. This research presents a promising solution to these long-standing issues, holding the potential to dramatically enhance EV performance. Achieving ranges beyond 1,000 miles would address 'range anxiety' for consumers and possess the transformative power to fundamentally reshape the EV market.

Strategic Significance & Outlook

While this new anode-free lithium metal battery design has not yet been demonstrated in production EVs, its potential impact is profound. If the research findings can be further scaled and adapted for large-scale manufacturing processes, it would represent a game-changer for the EV industry. Lighter, higher energy density batteries would contribute to cost reduction, performance improvement, and faster charging times for EVs, accelerating the future of sustainable mobility. Future efforts will concentrate on further validation and optimization of durability, safety, and scalability for real-world deployment.

Source: <https://www.t3.com/auto/this-new-battery-breakthrough-could-get-your-next-ev-over-the-1-000-mile-mark>

Collected: October 02, 2026 | Automated Research System (Gemini API)

#10 ProLogium Gen4: Mercedes-Benz adoption for next-gen EVs

Published September 29, 2026 Inside Deep Tech Germany, Taiwan



OVERVIEW

Mercedes-Benz has strengthened its partnership with ProLogium, securing priority access to their Gen4 solid-state battery cells for future EVs. A joint testing agreement was signed on September 24, 2026, where Mercedes-Benz will test the Gen4 cells' electrical, thermal, and safety performance at its own and specialized facilities.

ProLogium's Gen4 lithium-ceramic battery, in its anode-free version, achieves 430–470 Wh/kg and 1,000–1,100 Wh/L at the cell level, promising high energy, safety, and efficiency for next-generation electric vehicles.

Key Findings

Mercedes-Benz has expanded its strategic partnership with Taiwan-based battery manufacturer ProLogium, ensuring preferential access to their latest Gen4 all-solid-state battery cells. This collaboration is designed to integrate high-energy density, superior safety, and highly efficient battery technology into future electric vehicles (EVs).

Technical / Clinical Details

The joint testing agreement between Mercedes-Benz and ProLogium, formalized on September 24, 2026, dictates that Mercedes-Benz will rigorously evaluate the electrical, thermal, and safety performance of ProLogium's Gen4 cells. These tests will be conducted at Mercedes-Benz's internal facilities as well as at specialized independent testing centers. ProLogium's Gen4 lithium-ceramic battery system incorporates an all-inorganic electrolyte and ceramic separator. Notably, its anode-free variant is projected to achieve an impressive gravimetric energy density of 430–470 Wh/kg and an exceptionally high volumetric energy density of 1,000–1,100 Wh/L at the cell level. These performance metrics are crucial not only for significantly extending EV driving range and enabling more compact and lighter battery packs but also for ensuring the inherent safety advantages of an all-solid-state structure.

Background & Context

All-solid-state batteries are gaining considerable attention as a next-generation battery technology that offers substantial advantages in both safety and performance when compared to conventional liquid lithium-ion batteries. These benefits include the elimination of electrolyte leakage and fire risks, alongside the potential for much higher energy densities. Automotive manufacturers are actively seeking to secure safer and higher-performing battery technologies to enhance the competitiveness of their EV offerings. ProLogium is a recognized leader in the solid-state battery sector, and this partnership with a premium automotive brand like Mercedes-Benz underscores that ProLogium's technology is reaching a critical stage of commercial readiness.

Strategic Significance & Outlook

The alliance between Mercedes-Benz and ProLogium is set to become a significant driving force for the practical implementation of all-solid-state battery technology. Data derived from the stringent testing of Gen4 cells will accelerate the integration of solid-state batteries into future Mercedes-Benz EVs. The high energy density and enhanced safety profile demonstrated by ProLogium's technology are expected to dramatically improve EV range and boost consumer confidence, thereby significantly contributing to the expansion of the EV market. This partnership further clarifies the pathway towards mass production and cost-efficiency improvements for solid-state batteries, potentially having a profound impact on the electrification strategies of the entire automotive industry.

Source: <https://carboncredits.com/mercedes-benz-prologium-gen4-solid-state-ev-battery/>

Collected: October 02, 2026 | Automated Research System (Gemini API)

#11 Ion Energy: 520Wh/kg all-solid-state EV battery specs

Published September 30, 2026 SMM India, China, Japan



OVERVIEW

In Q3 2026, Ion Energy announced a 51Ah automotive-grade polymer all-solid-state battery boasting an energy density of 520Wh/kg, 6-minute ultrafast charging, operation across -45°C to 120°C , and a cycle life exceeding 3,500 cycles. Concurrently, China's Xinyuren successfully prototyped second-generation halide solid electrolytes, while Japan's Sumitomo Chemical plans mass production of halide electrolytes by fiscal year 2028. These advances underscore the industry's shift towards ton-scale mass production and diversified high-performance material development.

Key Findings

In the third quarter of 2026, Ion Energy unveiled an automotive-grade polymer all-solid-state battery demonstrating an impressive energy density of 520 Wh/kg, capability for ultra-fast charging in 6 minutes, operational stability across an extreme temperature range from -45°C to 120°C, and a cycle life exceeding 3,500 cycles for a 51 Ah cell. This breakthrough represents a significant leap in solid-state battery performance, particularly for electric vehicle applications.

Technical / Clinical Details

Ion Energy's new polymer-based solid-state battery sets new benchmarks beyond current lithium-ion technology. The 520 Wh/kg energy density promises substantially extended EV range, while the 6-minute ultra-fast charging drastically improves user convenience. The exceptionally wide operating temperature range from -45°C to 120°C ensures robust reliability in diverse climates, and a cycle life of over 3,500 cycles reduces battery replacement frequency and overall cost of ownership. In parallel, China's Xinyuren has successfully prototyped a second-generation halide solid electrolyte, expanding the range of viable solid electrolyte materials. Japan's Sumitomo Chemical is also planning mass production of halide electrolytes by fiscal year 2028, signaling the concrete commercialization of halide-based solid electrolytes alongside sulfide variants.

Background & Context

The solid-state battery industry is at a pivotal juncture, transitioning from "pilot validation" to "pre-mass production" driven by advancements in material science and manufacturing techniques. Sulfide electrolytes are already entering a phase of "increased volume and reduced cost," indicating growing production scale and improved cost efficiency. Ion Energy's achievement highlights the immense potential of polymer solid electrolytes, strongly supporting their practical application in the EV sector. The progress in halide electrolytes, which offer the potential for even higher ionic conductivity and stability, diversifies the technological options available to meet various market demands.

Strategic Significance & Outlook

These technological advancements are expected to accelerate the widespread adoption of solid-state batteries in the automotive industry. The high energy density and rapid charging capabilities achieved by Ion Energy's battery address major barriers to EV adoption, promoting greater consumer acceptance. The competitive development of multiple solid electrolyte types will ultimately lead to the realization of high-performance, cost-effective solid-state batteries. With halide electrolyte mass production anticipated from 2028, further market acceleration and innovation are expected.

Source: <https://news.metal.com/newscontent/104142225-solid-state-battery-q3-policy-heat-materials-cold-toward-ton-scale>

Collected: October 02, 2026 | Automated Research System (Gemini API)

#12 Panasonic Energy: Solid-state battery roadmap for 2026

Published September 27, 2026 BigGo Finance Japan



OVERVIEW

Samsung SDI and Panasonic Energy are prioritizing humanoid robots as an early application for solid-state batteries. Panasonic Energy will begin sampling small industrial solid-state batteries (coin and prismatic types, with 150°C heat resistance) by Q4 2026, targeting sensors and monitoring devices in industrial robots. Meanwhile, Toyota and Idemitsu continue to aim for the deployment of sulfide-based solid-state batteries in EVs between 2027 and 2028.

Key Findings

Following Samsung SDI, Panasonic Energy has also indicated a strong focus on humanoid robots as an initial market for solid-state batteries. Panasonic Energy plans to commence sample shipments of small industrial solid-state batteries (coin and prismatic types) in Q4 2026, designed to withstand temperatures up to 150°C. These batteries are targeted for applications such as sensors and monitoring devices in industrial robots and other equipment exposed to high temperatures. In parallel, Japan's Toyota and Idemitsu Kosan continue to pursue their goal of deploying sulfide-based solid-state batteries in electric vehicles (EVs) between 2027 and 2028.

Technical Details

Panasonic Energy's small industrial solid-state batteries will be available in both coin and prismatic formats, with a notable feature being their high heat resistance up to 150°C. This allows for stable operation in high-temperature environments prevalent in industrial settings or within certain electronic devices. This capability offers unprecedented performance and reliability for sensors in factory robots, heat-generating monitoring equipment, and other specialized industrial devices where conventional batteries fall short. Conversely, Toyota and Idemitsu Kosan's joint development of sulfide-based solid-state batteries is primarily focused on achieving extended range and rapid charging performance for EVs, aiming to surpass the limitations of current lithium-ion batteries. While sulfide-based solid electrolytes offer high ionic conductivity, challenges related to manufacturing processes and air stability have existed, but both companies are working to overcome these for EV commercialization by 2027-2028.

Background & Context

The race for solid-state battery development spans diverse sectors including automotive, consumer electronics, and industrial equipment. All-solid-state batteries for EVs are considered the ultimate goal due to their high energy density and safety, but mass production still faces challenges related to manufacturing costs and technical complexities. Against this backdrop, a strategy of early adoption in niche markets such as humanoid robots or industrial equipment operating under high-temperature conditions is gaining traction. This approach aims to mature the technology and drive down costs, serving as a crucial stepping stone towards the broader commercialization of solid-state batteries for EVs.

Strategic Significance & Outlook

Panasonic Energy's initiation of sample shipments for small industrial solid-state batteries marks a groundbreaking step that will accelerate the practical application of solid-state batteries in specific industrial sectors. This could open up new applications in high-temperature environments. Meanwhile, the development of sulfide-based solid-state batteries by Toyota and Idemitsu Kosan remains a significant challenge that will shape the future of the automotive industry. These distinct approaches highlight the diverse evolution of solid-state battery technology, and success in each respective area is expected to drive broader market adoption. The progress of technological development and market introduction over the next few years will be crucial in shaping the future of next-generation batteries.

Source: <https://finance.biggo.com/news/9387c612-a5af-4a80-9760-6c4b16376b51>

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#13 China 15th Five-Year Plan: Solid-state battery timeline 2030

Published September 28, 2026 Global Times China



OVERVIEW

China has officially announced its 15th Five-Year Plan (2026-2030) for the battery industry, setting an ambitious goal for initial large-scale application of all-solid-state batteries by 2030. The plan also includes targets to extend the cycle life of long-life lithium batteries to 15,000 cycles and reduce the product defect rate for major manufacturers to one part per billion. This comprehensive strategy aims to accelerate commercialization breakthroughs in battery technology, enhancing China's manufacturing, energy, transportation, and digital capabilities, and could significantly reshape the global battery market landscape.

Key Findings

China has unveiled an ambitious battery development plan under its 15th Five-Year Plan (2026-2030), aiming for initial large-scale application of all-solid-state batteries by 2030. This strategic directive emphasizes enhancing ion conductivity, improving cycle stability, and optimizing cost-efficiency to achieve rapid commercialization breakthroughs in next-generation battery technologies.

Technical & Policy Details

- **Solid-State Battery Ambition:** The plan explicitly targets the widespread adoption of all-solid-state batteries by the end of the decade, signaling a significant push towards automotive and grid-scale energy storage solutions.
- **Lithium Battery Performance Benchmarks:** For traditional lithium batteries, the objectives are equally aggressive: increasing the cycle life to an unprecedented 15,000 cycles and achieving a product defect rate of one part per billion for leading manufacturers. These targets highlight a national commitment to both performance and reliability.
- **R&D Focus:** Key research and development areas include advanced materials for higher ion conductivity, robust interface engineering for improved cycle stability, and novel manufacturing processes to reduce production costs. Substantial national resources are expected to be allocated to these critical technological fronts.

Background & Context

This initiative is central to China's broader strategy of establishing a new energy system, upgrading its manufacturing sector, and strengthening its energy, transport, and digital infrastructures. Battery technology is considered a foundational element for innovation across these sectors. While Chinese companies like WeLion and QingTao have already deployed semi-solid-state batteries in EVs such as the Nio ET9 and IM L6, this plan marks a definitive shift towards pure all-solid-state solutions, aiming to cement China's global leadership in advanced battery technology.

Strategic Significance & Outlook

The Chinese government's strong backing for all-solid-state battery development is poised to accelerate its commercialization timeline and profoundly impact the global battery market. Achieving these targets will necessitate overcoming complex material science, manufacturing process, and quality control challenges. However, with concentrated state-led investment and R&D efforts, China is positioning itself at the forefront of the next-generation battery race, compelling international competitors to intensify their own development initiatives.

Source: <https://www.globaltimes.cn/page/202609/1371497.shtml>

Collected: October 02, 2026 | Automated Research System (Gemini API)

#14 South Korea: All-solid-state battery roadmap and 2030 goals

Published September 30, 2026 pv magazine Global South Korea



OVERVIEW

The South Korean government has launched a new 'Battery Industry Technology Roadmap' aiming for the commercialization of all-solid-state batteries by 2030 to regain market leadership. Key targets include developing all-solid-state batteries with an energy density of 400Wh/kg by 2028, specifically for high-performance EVs, robots, drones, and urban air mobility (UAM). An ambitious goal for the 'world's first' prototype development is set for 2027, underscoring South Korea's strategic drive to strengthen its competitiveness in next-generation battery technologies.

Key Findings

The South Korean government has unveiled an ambitious 'Battery Industry Technology Roadmap,' aiming to commercialize all-solid-state batteries by 2030. This strategic initiative is designed to re-establish South Korea's leadership in the global battery market, with a specific target of developing all-solid-state batteries boasting an energy density of 400Wh/kg by 2028.

Technical & Policy Details

- **Energy Density Goal:** The roadmap sets an aggressive energy density target of 400Wh/kg for all-solid-state batteries by 2028. This represents a significant leap from current lithium-ion technologies and is crucial for extending the range of electric vehicles (EVs) and the operational endurance of drones and urban air mobility (UAM) platforms.
- **Prototype Milestone:** A critical intermediate goal is the development of the 'world's first' all-solid-state battery prototype by 2027. This milestone is intended to showcase South Korea's technological prowess and accelerate the transition from research to practical application.
- **Target Applications:** The primary target markets identified are high-performance EVs, robotics, drones, and UAM. These sectors demand batteries with superior safety, durability, and high energy density, making them ideal applications for all-solid-state technology.
- **Comprehensive National Strategy:** Beyond technological development, the roadmap encompasses a broader national strategy that includes stabilizing raw material supply chains, innovating manufacturing processes, and cultivating skilled professionals to support the entire battery ecosystem.

Background & Context

South Korea has historically been a dominant player in the battery industry but faces increasing competition from China and technological advancements from Japan. All-solid-state battery technology is widely regarded as the ultimate frontier for next-generation batteries, with global powers racing to achieve commercial viability. In this context, the Korean government's robust roadmap seeks to secure a technological advantage and lead future markets by pushing beyond the limitations of existing lithium-ion chemistries and creating new industrial value.

Strategic Significance & Outlook

This roadmap provides clear direction and strong incentives for South Korean battery manufacturers, research institutions, and universities. The ambitious timelines—prototype by 2027, 400Wh/kg by 2028, and commercialization by 2030—are expected to spur intensive R&D and investment. Successful execution would position South Korea as a pivotal force in the EV, robotics, and aerospace industries, significantly contributing to global battery technology evolution. This initiative will also intensify competition with other leading solid-state battery developers worldwide, such as Toyota in Japan and QuantumScape in the US.

Source: <https://www.pv-magazine.com/2026/09/30/south-korea-marks-major-shift-to-sodium-ion-batteries-to-regain-market/>

Collected: October 02, 2026 | Automated Research System (Gemini API)