

TROY TECHNICAL

ALL-SOLID-STATE BATTERIES

WEEKLY REPORT

October 3 - October 9, 2026 | Issue 2026-W40

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

15

ANALYZED ARTICLES

10

PRIORITY THEMES

Issued 2026-10-09 | English edition | fixed approved cover artwork



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

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

SIGNAL 01 | ELECTROLYTE

Samsung SDI: Sulfide battery material roadmap for 2027 launch

Samsung SDI has signed an MOU with South Korean cathode material manufacturer EcoPro BM for the joint development of sulfide-based all-solid-state battery materials.

SIGNAL 02 | ELECTRODE INTERFACE

CALB and Gotion High-Tech: Solid-state battery pilot line specs

Chinese battery manufacturers CALB and Gotion High-Tech are making significant strides in high-energy-density solid-state battery development. CALB has established a dedicated pilot production capacity for automotive, robotics, and aircraft applications.

SIGNAL 03 | CELL PROCESS

Solid-state batteries: Toyota, BYD and Hyundai 2027-2030 roadmap

Hyundai Motor Group is establishing a solid-state battery pilot line targeting commercial mass production by 2030. Toyota, in collaboration with Idemitsu Kosan, aims for mass production as early as 2027-2028.

SIGNAL 04 | VALIDATION

Honda: Solid-state battery pilot line and roll-press specs

Honda has successfully launched a solid-state battery pilot production line, integrating an innovative roll-press technique that significantly enhances solid electrolyte layer density and overall energy efficiency.

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

400W

A15

SOURCE-BOUND CONDITION

Gotion High-Tech unveiled a solid-state cell with approximately 400Wh/kg energy density and is developing a 2GWh production line.

90%

A14

SOURCE-BOUND CONDITION

Indian startup Macsen Energy announced its sodium-ion battery cell, featuring a proprietary Prussian white cathode material, exceeded 1,500 charge-discharge cycles in lab tests, retaining 90% of initial capacity after.

824 W

A06

SOURCE-BOUND CONDITION

WeLion New Energy has achieved a breakthrough in semi-solid-state battery technology, demonstrating an impressive energy density of 824 Wh/kg in 2025 testing.

5%

A10

SOURCE-BOUND CONDITION

Batteries utilizing SFIE achieve a 5% to 80% charge in a mere 6.4 minutes, endure over 1,000 fast-charge cycles, and maintain over 90% capacity at -20°C.

P05

A14

SOURCE-BOUND CONDITION

Indian startup Macsen Energy announced its sodium-ion battery cell, featuring a proprietary Prussian white cathode material, exceeded 1,500 charge-discharge cycles in lab tests, retaining 90% of initial capacity after.

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

Samsung SDI has signed an MOU with South Korean cathode material manufacturer EcoPro BM for the joint development of.

2

Electrode interface

P02/P07

Chinese battery manufacturers CALB and Gotion High-Tech are making significant strides in high-energy-density solid-state.

3

Cell process

P03/P08

Hyundai Motor Group is establishing a solid-state battery pilot line targeting commercial mass production by 2030.

4

Validation

P04/P09

Honda has successfully launched a solid-state battery pilot production line, integrating an innovative roll-press technique.

5

Vehicle deployment

P05/P10

Indian startup Macsen Energy announced its sodium-ion battery cell, featuring a proprietary Prussian white cathode material.

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

Samsung SDI: Sulfide battery material roadmap for 2027 launch

A03 | Electrolyte | Scale-up

Date not stated

FACT

Samsung SDI has signed an MOU with South Korean cathode material manufacturer EcoPro BM for the joint development of sulfide-based all-solid-state battery materials. Both companies aim for commercialization by 2027, with Samsung SDI leading cell development and mass production refinement, while EcoPro BM will operate a 40-ton-per-year sulfide solid electrolyte pilot line and spearhead cathode material R&D.

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 22/25 | MATURITY 5/5 | DECISION LOCUS: BUSINESS / RULES

P02

CALB and Gotion High-Tech: Solid-state battery pilot line specs

A15 | Electrode interface | Product adoption

Date not stated

FACT

Chinese battery manufacturers CALB and Gotion High-Tech are making significant strides in high-energy-density solid-state battery development. CALB has established a dedicated pilot production capacity for automotive, robotics, and aircraft applications. Gotion High-Tech unveiled a solid-state cell with approximately 400Wh/kg energy density and is developing a 2GWh production line.

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 4/5 | DECISION LOCUS: SYSTEM / ADOPTION

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

P03

Solid-state batteries: Toyota, BYD and Hyundai 2027-2030 roadmap

A12 | Cell process | Scale-up

Date not stated

FACT

Hyundai Motor Group is establishing a solid-state battery pilot line targeting commercial mass production by 2030. Toyota, in collaboration with Idemitsu Kosan, aims for mass production as early as 2027-2028. Nissan plans commercialization for fiscal year 2028, while BYD outlines a roadmap for pilot vehicle production in Q1 2027, mass production in 2028, and mainstream adoption 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 P03.

UNKNOWN

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

EDITORIAL SCORE 22/25 | MATURITY 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

P04

Honda: Solid-state battery pilot line and roll-press specs

A01 | Validation | Product adoption

Date not stated

FACT

Honda has successfully launched a solid-state battery pilot production line, integrating an innovative roll-press technique that significantly enhances solid electrolyte layer density and overall energy efficiency. This breakthrough addresses critical interfacial contact issues between powdered solid electrolytes and electrodes, marking a substantial step toward practical automotive-grade solid-state batteries.

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

Macsen Energy sodium-ion cells: Prussian White cathode specs

A14 | Vehicle deployment | Product adoption

Date not stated

FACT

Indian startup Macsen Energy announced its sodium-ion battery cell, featuring a proprietary Prussian white cathode material, exceeded 1,500 charge-discharge cycles in lab tests, retaining 90% of initial capacity after 1,000 cycles. The cathode reports a specific capacity exceeding 150 mAh/g, 99.9% coulombic efficiency, and good air stability. Macsen plans a tonne-scale Prussian blue analogue cathode production facility 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 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

WeLion: Semi-solid battery specs and 2027 all-solid roadmap

A06 | Electrolyte | Scale-up

Date not stated

FACT

WeLion New Energy has achieved a breakthrough in semi-solid-state battery technology, demonstrating an impressive energy density of 824 Wh/kg in 2025 testing. This follows a successful 2023 partnership with Nio, which saw a 360 Wh/kg battery pack enabling over 1000 km range in Nio vehicles. The company is actively pursuing the commercial launch of a 400 Wh/kg all-solid-state battery for automotive applications by 2027, signaling a significant leap in EV performance and broader adoption.

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

China battery blueprint: Solid-state application timeline for 2030

A13 | Electrode interface | Research

Date not stated

FACT

China has set a national objective for the initial large-scale application of all-solid-state batteries by 2030, as part of its first national development plan for the battery industry (2026-2030). The plan targets breakthroughs in advanced electrode materials, new electrolytes, and specialized auxiliary materials, aiming for 15,000 charging cycles for long-life lithium batteries and reducing defect rates to parts-per-billion levels by 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 P07.

UNKNOWN

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

EDITORIAL SCORE 21/25 | MATURITY 1/5 | DECISION LOCUS: SYSTEM / ADOPTION

P08

Samsung SDI: Sulfide battery roadmap for 2027 robotics use

A05 | Cell process | Scale-up

Date not stated

FACT

Samsung SDI and EcoPro BM announced an MOU to collaborate on sulfide-based all-solid-state battery materials, aiming for commercialization by 2027. Samsung SDI will focus on battery cell development and mass-production technology, while EcoPro BM will lead core battery material R&D. The partnership targets mass production in the second half of 2027, with initial adoption planned for humanoid 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 P08.

UNKNOWN

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

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

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

P09

Samsung SDI vs LGES: Solid-state battery timelines for 2027-30

A07 | Validation | Product adoption

Date not stated

FACT

Leading South Korean battery manufacturers Samsung SDI and LG Energy Solution are pursuing distinct strategies for solid-state battery commercialization. Samsung SDI is accelerating its material supply chain development to commercialize sulfide-based solid-state batteries by 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 P09.

UNKNOWN

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

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

P10

ProLogium SFIE DCN: Solid-state electrolyte 6.4-min charge specs

A10 | Vehicle deployment | Product adoption

Date not stated

FACT

ProLogium has introduced its innovative DCN (Dynamic Cross-linking Network) electrolyte, SFIE, demonstrating an ionic conductivity of up to 57 mS/cm at room temperature and high lithium-ion transference number. Batteries utilizing SFIE achieve a 5% to 80% charge in a mere 6.4 minutes, endure over 1,000 fast-charge cycles, and maintain over 90% capacity at -20°C.

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: BUSINESS / RULES

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 01-15

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	Honda: Solid-state battery pilot line and roll-press specs	https://www.topspeed.com/science-behind-honda-solid-state-battery-breakthrough/
A02	Toyota: Lexus solid-state battery specs and 2027-2028 timeline	https://news.metal.com/newscontent/104143572-solid-state-battery-next-decade-series-part-7-of-9-global-competitive-landscape-the-patent-shadow-war-and-industrialisation-race-among-china-japan-and-south-korea-smm-analysis
A03	Samsung SDI: Sulfide battery material roadmap for 2027 launch	https://www.thelec.net/news/articleView.html?idxno=14428
A04	Ceramic Fillers: How they boost polymer electrolyte conductivity	https://bioengineer.org/tiny-ceramic-fillers-could-crack-the-biggest-problem-in-solid-state-batteries/
A05	Samsung SDI: Sulfide battery roadmap for 2027 robotics use	https://www.energytrend.com/news/20261009-52251.html
A06	WeLion: Semi-solid battery specs and 2027 all-solid roadmap	https://www.industrialbriefs.com/welion-semi-solid-state-batteries/
A07	Samsung SDI vs LGES: Solid-state battery timelines for 2027-30	https://www.businesskorea.co.kr/news/articleView.html?idxno=278425
A08	Gel Electrolyte explained: Li NCM811 battery stability specs	https://www.eurekalert.org/news-releases/1146949
A09	PTFE-Free Dry Electrode: Korean EV battery charging specs 2026	https://www.techbriefs.com/component/content/article/55990-faster-charging-and-increased-driving-range-with-dry-electrodes
A10	ProLogium SFIE DCN: Solid-state electrolyte 6.4-min charge specs	https://markets.businessinsider.com/news/stocks/prologium-unveils-dcn-opening-a-third-state-electrolyte-universe-at-paris-motor-show-1036608719
A11	Honda solid-state batteries: EV range specs and 2028 timeline	https://connectorsupplier.com/connecting-the-next-generation-of-ev-batteries/
A12	Solid-state batteries: Toyota, BYD and Hyundai 2027-2030 roadmap	https://finance.biggo.com/news/fd1548d8-1522-43b3-98dd-1b590f1a010f
A13	China battery blueprint: Solid-state application timeline for 2030	https://newenergyweekly.co.uk/china-targets-solid-state-battery-scale-up-by-2030-in-first-national-blueprint/
A14	Macsen Energy sodium-ion cells: Prussian White cathode specs	https://www.pv-magazine.com/2026/10/06/indian-startup-claims-over-1500-cycles-for-sodium-ion-cell-with-prussian-white-cathode/
A15	CALB and Gotion High-Tech: Solid-state battery pilot line specs	https://www.chinadaily.com.cn/a/202610/08/WS6ac6d59de4b06d4aa0561911.html

SolidStateBattery — Selected Articles

Date: 2026-10-11

Articles: 15

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#01 Honda: Solid-state battery pilot line and roll-press specs

Published October 01, 2026 Top Speed Japan



OVERVIEW

Honda has successfully launched a solid-state battery pilot production line, integrating an innovative roll-press technique that significantly enhances solid electrolyte layer density and overall energy efficiency. This breakthrough addresses critical interfacial contact issues between powdered solid electrolytes and electrodes, marking a substantial step toward practical automotive-grade solid-state batteries. The technology is crucial for Honda's ambitious goal of producing only battery EVs and fuel cell vehicles by 2040.

Key Findings

Honda has commenced operations at its solid-state battery pilot production line, achieving a significant breakthrough by employing a novel roll-press technology. This method has successfully improved the density of the solid electrolyte layer and, consequently, the energy efficiency of the batteries. This advance is critical for enhancing the contact between the powdered solid electrolyte and the electrodes, representing a major stride in the development of automotive-sized solid-state batteries.

Technical / Clinical Details

The roll-press technique involves uniformly compacting the solid electrolyte and electrode materials, thereby optimizing the ionic conduction pathways and reducing interfacial resistance—a common challenge in conventional manufacturing. This process is instrumental in mitigating resistance increases caused by poor interfacial contact, leading to a substantial improvement in the overall energy efficiency of the battery. The operational status of this pilot line signifies a critical milestone for an automaker in the journey towards mass production of solid-state batteries. Honda believes this technology forms the foundation for achieving the high energy density, safety, and longevity required for next-generation electric vehicles.

Background & Context

Solid-state batteries are widely recognized for their potential to offer superior energy density, safety, and faster charging capabilities compared to current lithium-ion batteries. They are considered essential for extending the range and reducing the cost of electric vehicles (EVs), driving intense global competition among automotive and battery manufacturers. Honda has set an ambitious target to produce only battery electric vehicles (BEVs) and fuel cell vehicles (FCEVs) globally by 2040, making the early commercialization of solid-state battery technology indispensable for achieving this goal.

Strategic Significance & Outlook

The activation of this pilot production line is expected to accelerate Honda's identification and resolution of technical challenges associated with mass production. Further optimization and cost reduction of the roll-press technology could bring solid-state batteries significantly closer to commercial viability. This achievement represents a pivotal step for Honda towards realizing its vision of a sustainable mobility society and has the potential to accelerate the transformation of the broader EV market.

Source: <https://www.topspeed.com/science-behind-honda-solid-state-battery-breakthrough/>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#02 Toyota: Lexus solid-state battery specs and 2027-2028 timeline

Published October 05, 2026 SMM Analysis China



OVERVIEW

Toyota plans to integrate its groundbreaking solid-state battery technology into Lexus flagship models by 2027-2028, targeting 10GWh production capacity by 2030. The battery boasts an impressive energy density of 480-500 Wh/kg, enabling an 80% charge in just 10 minutes, and maintaining over 90% capacity retention after 2,000 cycles. This represents a significant leap in EV performance, addressing key consumer concerns regarding range, charging speed, and longevity.

Key Findings

Toyota is set to revolutionize the electric vehicle (EV) market by integrating its advanced solid-state battery technology into Lexus flagship models starting in 2027-2028. This next-generation battery achieves an exceptional energy density of 480-500 Wh/kg, allowing for an 80% charge in a mere 10 minutes, and remarkably, retains over 90% of its capacity even after 2,000 charge-discharge cycles. These performance metrics significantly surpass current lithium-ion battery capabilities, promising extended range, ultra-fast charging, and superior durability for future EVs.

Technical & Collaborative Details

- **Performance Benchmarks:** The reported energy density of 480-500 Wh/kg is approximately double that of conventional lithium-ion batteries, directly translating to substantially longer driving ranges for EVs. The 10-minute 80% charging time effectively eliminates range anxiety and makes EV recharging comparable to refueling a gasoline car. The 90%+ capacity retention after 2,000 cycles ensures a long operational lifespan for the battery, reducing total cost of ownership and enhancing consumer confidence.
- **Strategic Partnerships:** Toyota is actively collaborating with Sumitomo Metal Mining on the joint development of high-durability cathode materials for these solid-state batteries, with plans for large-scale production commencing in fiscal year 2028. Furthermore, Idemitsu Kosan is slated to provide a stable supply of sulfide solid electrolytes, solidifying the critical material supply chain.
- **Production Scale-Up:** The company has ambitious plans to establish a production capacity of 10 GWh by 2030, indicating a clear path towards mass commercialization and widespread adoption.

Background & Industry Context

Solid-state batteries are considered the holy grail of next-generation energy storage due to their potential for higher energy density, faster charging, and inherent safety improvements over current liquid-electrolyte lithium-ion batteries. The absence of flammable liquid electrolytes eliminates fire risks and mitigates dendrite formation, a common cause of performance degradation and short circuits in traditional batteries. This breakthrough by Toyota places it at the forefront of the global race to commercialize solid-state technology.

The competitive landscape is intense, with major players like Samsung SDI also targeting sulfide-based solid-state battery mass production by 2027, backed by significant R&D investment. ProLogium Technology's plans for a gigafactory in Dunkirk, France, further underscore the global commitment to this transformative technology. Toyota's announcement, with its concrete performance data and aggressive timelines, positions Japan as a potential leader in this crucial technological shift.

Strategic Significance & Outlook

The commercialization of Toyota's solid-state battery technology is poised to be a game-changer for the EV industry. It could fundamentally alter consumer perception of EVs by addressing major pain points. The superior performance characteristics — extended range, rapid charging, and enhanced safety — are expected to drive accelerated EV adoption rates worldwide. The robust partnerships with material suppliers like Sumitomo Metal Mining and Idemitsu Kosan are critical for establishing a resilient and scalable supply chain, bolstering Japan's competitive edge in advanced battery manufacturing.

Source: <https://news.metal.com/newscontent/104143572-solid-state-battery-next-decade-series-part-7-of-9-global-competitive-landscapethe-patent-shadow-war-and-industrialisation-race-among-china-japan-and-south-korea-smm-analysis>

#03 Samsung SDI: Sulfide battery material roadmap for 2027 launch

Published October 06, 2026 The Elec Inc. South Korea



OVERVIEW

Samsung SDI has signed an MOU with South Korean cathode material manufacturer EcoPro BM for the joint development of sulfide-based all-solid-state battery materials. Both companies aim for commercialization by 2027, with Samsung SDI leading cell development and mass production refinement, while EcoPro BM will operate a 40-ton-per-year sulfide solid electrolyte pilot line and spearhead cathode material R&D. This partnership is crucial for Samsung SDI to establish leadership in solid-state batteries and enhance competitiveness in EV and robotics markets.

Key Findings

Samsung SDI has entered into a strategic Memorandum of Understanding (MOU) with EcoPro BM, a prominent South Korean cathode material manufacturer, for the joint development of sulfide-based all-solid-state battery materials. This partnership is specifically geared towards aggressively pursuing the commercialization of sulfide-based solid-state batteries by 2027. Under the agreement, Samsung SDI will focus on battery cell development and refining mass production technologies, while EcoPro BM will operate a pilot production line capable of 40 tons per year for sulfide solid electrolytes and lead the research and development of cathode materials tailored for solid-state applications. This collaborative effort is anticipated to bolster South Korea's competitiveness in the next-generation battery market.

Technical & Collaborative Details

- **Division of Roles:** Samsung SDI will be responsible for the design of all-solid-state battery cells, performance optimization, and establishing mass production processes with a view towards future gigafactories. EcoPro BM, conversely, will ensure a stable supply chain for sulfide-based solid electrolytes, a core material for solid-state batteries, by operating its 40-ton-per-year pilot line. EcoPro BM will also drive innovative R&D for cathode materials, which significantly impact solid-state battery performance, leveraging both companies' respective strengths.
- **Commercialization Target:** Both companies have set an aggressive target of 2027 for the commercialization of sulfide-based all-solid-state batteries. This strategy aims for early market entry to secure a competitive advantage in the EV and other high-energy-density application markets.
- **Strategic Significance:** Cathode materials are crucial components heavily influencing battery cost and performance. The partnership with EcoPro BM, a global leader in cathode technology, is indispensable for Samsung SDI to accelerate its solid-state battery development. This vertically integrated approach facilitates efficient development across all stages, from materials to cell production and mass manufacturing.

Background & Industry Context

All-solid-state batteries are at the forefront of a global development race as the next-generation technology to succeed lithium-ion batteries, promising higher energy density, faster charging capabilities, and superior safety (non-flammability). Sulfide-based solid electrolytes are considered particularly promising due to their high ion conductivity and potential for good interfacial contact with electrodes.

Samsung SDI has been actively investing in solid-state battery R&D, having showcased solid-state battery cell samples at the InterBattery exhibition in March 2026 and outlining a roadmap for applications specifically in the robotics sector. The partnership with EcoPro BM marks a significant milestone in achieving this ambitious roadmap, aiming for leadership in this transformative field.

Strategic Significance & Outlook

The alliance between Samsung SDI and EcoPro BM is poised to accelerate the commercialization of sulfide-based solid-state batteries, potentially acting as a game-changer in the EV market. Mass production of high-performance and safe solid-state batteries could drastically extend EV range, reduce charging times, and significantly enhance consumer appeal. Furthermore, this technology is expected to contribute to the creation of new markets demanding high power output and safety, such as robotics, drones, and urban air mobility (UAM). This collaboration is a critical move that will drive technological innovation and market expansion for solid-state batteries.

Source: <https://www.thelec.net/news/articleView.html?idxno=14428>

#04 Ceramic Fillers: How they boost polymer electrolyte conductivity

Published October 09, 2026 IEEE Spectrum USA



OVERVIEW

Dispersing fine inorganic ceramic fillers within polymer electrolytes has been shown to suppress lithium dendrite formation and improve ion conductivity in solid-state batteries. The ceramic surfaces form mechanically strong and electrochemically stable inorganic-rich interfaces, composed of species like lithium fluoride, which locally concentrate lithium ions and homogenize flux at the electrode surface. This discovery presents a significant pathway to addressing critical safety and performance challenges in solid-state battery technology, paving the way for longer battery life and enhanced reliability.

Key Findings

Research indicates that dispersing fine inorganic particles, specifically ceramic fillers, within polymer electrolytes can effectively suppress lithium dendrite formation while simultaneously enhancing lithium ion conductivity in solid-state batteries. This represents a significant advancement towards resolving one of the primary hurdles hindering the commercialization of solid-state battery technology, offering a promising solution to improve both safety and performance.

Technical / Clinical Details

The surfaces of these ceramic fillers create an inorganic-rich interface, composed of mechanically robust and electrochemically stable species such as lithium fluoride, lithium oxide, and lithium carbonate. This interface plays a crucial role in locally concentrating lithium ions at the electrode surface and homogenizing the ionic flux. This mechanism effectively impedes the non-uniform growth of lithium dendrites, thereby improving the battery's safety and extending its cycle life. The observed enhancement in room-temperature ion conductivity also contributes to better performance, particularly in colder climates.

Background & Context

Solid-state batteries are anticipated to offer superior safety, higher energy density, and longer cycle life compared to conventional lithium-ion batteries. However, the formation of lithium dendrites and high interfacial resistance between electrodes and electrolytes have been major technical barriers to their commercial deployment. The utilization of ceramic fillers provides a cost-effective and scalable solution to these challenges, potentially accelerating the development and adoption of next-generation battery technologies.

Strategic Significance & Outlook

This ceramic filler technology is expected to significantly advance the performance and safety of solid-state batteries, accelerating their adoption across a wide range of applications, including electric vehicles and portable electronics. Further research into the dendrite suppression mechanisms and optimization of filler materials will likely lead to even more efficient and long-lasting solid-state batteries. This breakthrough promises to drive the overall battery technology landscape forward, contributing to a more sustainable energy future.

Source: <https://bioengineer.org/tiny-ceramic-fillers-could-crack-the-biggest-problem-in-solid-state-batteries/>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#05 Samsung SDI: Sulfide battery roadmap for 2027 robotics use

Published October 09, 2026 Energytrend South Korea



OVERVIEW

Samsung SDI and EcoPro BM announced an MOU to collaborate on sulfide-based all-solid-state battery materials, aiming for commercialization by 2027. Samsung SDI will focus on battery cell development and mass-production technology, while EcoPro BM will lead core battery material R&D. The partnership targets mass production in the second half of 2027, with initial adoption planned for humanoid robotics.

Key Findings: Samsung SDI and EcoPro BM Forge Strategic Alliance for Solid-State Battery Material Development

Samsung SDI has announced a Memorandum of Understanding (MOU) with leading battery materials company EcoPro BM for the joint development of core materials for sulfide-based all-solid-state batteries, with a target of commercialization by 2027. This strategic alliance represents a significant step towards establishing Korean leadership in the next-generation battery market.

Technical & Clinical Details: Accelerated Development Through Specialization and Initial Robotics Integration

Under the terms of the MOU, Samsung SDI will concentrate on all-solid-state battery cell development and establishing stable mass production technology. EcoPro BM, conversely, will lead the research and development of critical battery materials, including high-performance sulfide solid electrolytes and cathode materials. This clear division of labor is expected to accelerate the development process. Both companies aim to commence mass production of all-solid-state batteries in the second half of 2027, initially targeting the humanoid robotics market, which demands high power output and enhanced safety.

Background & Context: Expanding Battery Portfolio for EV and Diverse Applications

Samsung SDI is actively expanding its battery portfolio to meet the diverse demands of applications beyond EVs, including robotics and AI data centers. The company is already advancing development in both all-solid-state and sodium-ion batteries, having also announced a cylindrical LFP (lithium iron phosphate) battery on September 29th. The partnership with EcoPro BM is specifically designed to accelerate the development of all-solid-state batteries, which combine high energy density with superior safety, thereby strengthening the company's competitiveness across a broader range of next-generation industries.

Strategic Significance & Outlook: 2027 Commercialization and Market Impact

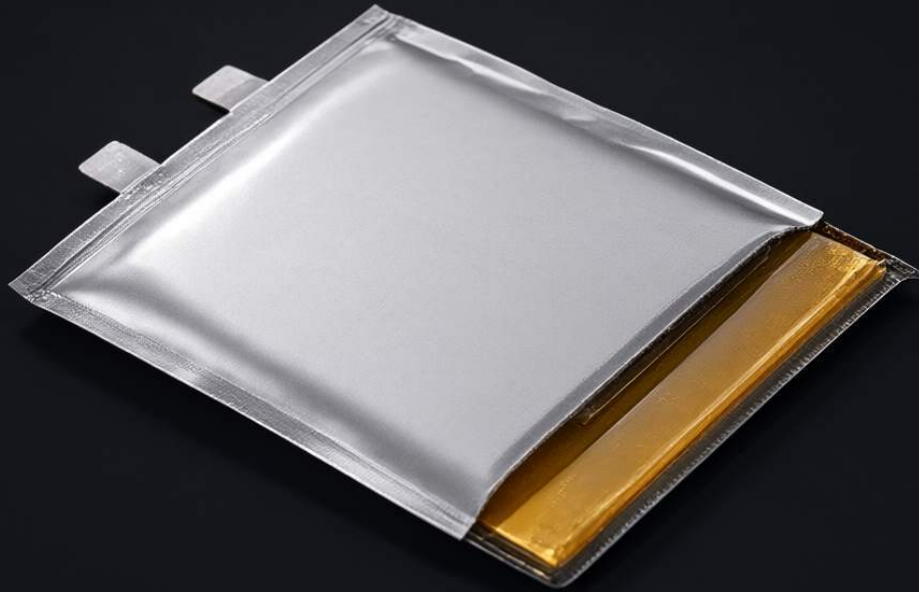
The alliance between Samsung SDI and EcoPro BM, coupled with their 2027 commercialization target, strongly indicates that the mass production of all-solid-state batteries is imminent. Sulfide-based solid electrolytes, in particular, hold promise for high ionic conductivity and stability, meaning breakthroughs in this area could significantly enhance EV range, charging speed, and safety. The initial integration into humanoid robotics will serve as a crucial step for demonstrating and improving the reliability of solid-state battery technology, ultimately accelerating its broader deployment into the automotive market.

Source: <https://www.energytrend.com/news/20261009-52251.html>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#06 WeLion: Semi-solid battery specs and 2027 all-solid roadmap

Published October 06, 2026 IndustrialBriefs China



OVERVIEW

WeLion New Energy has achieved a breakthrough in semi-solid-state battery technology, demonstrating an impressive energy density of 824 Wh/kg in 2025 testing. This follows a successful 2023 partnership with Nio, which saw a 360 Wh/kg battery pack enabling over 1000 km range in Nio vehicles. The company is actively pursuing the commercial launch of a 400 Wh/kg all-solid-state battery for automotive applications by 2027, signaling a significant leap in EV performance and broader adoption.

Key Findings

WeLion New Energy has made remarkable strides in semi-solid-state battery technology, demonstrating an impressive energy density of 824 Wh/kg in tests conducted in 2025. This achievement builds upon their successful 2023 collaboration with Chinese EV manufacturer Nio, which resulted in the deployment of a 360 Wh/kg battery pack that enabled Nio vehicles to achieve driving ranges exceeding 1000 km. The company has articulated an ambitious goal to launch an all-solid-state battery with a projected energy density of 400 Wh/kg for automotive applications by 2027, setting a new benchmark for electric vehicle capabilities.

Technical / Clinical Details

WeLion's semi-solid-state battery technology leverages a hybrid electrolyte design, which significantly enhances both energy density and safety compared to conventional lithium-ion batteries. The battery pack co-developed with Nio in 2023, already demonstrated real-world performance by enabling over 1000 km of range, mitigating range anxiety—a major barrier to EV adoption. The prototype semi-solid-state battery tested in 2025, reaching 824 Wh/kg, represents a substantial advancement in gravimetric energy density. This higher density facilitates lighter and more compact battery designs, not only for EVs but also for potential applications in drones and advanced portable electronics. The hybrid electrolyte aims to combine the high ionic conductivity of liquid electrolytes with the stability and safety benefits of solid-state materials.

Background & Context

The global electric vehicle market is intensely focused on overcoming challenges related to range anxiety and charging times. Solid-state batteries are widely recognized as the next-generation solution, promising superior energy density, faster charging capabilities, and significantly reduced fire risks due to the absence of flammable liquid electrolytes. WeLion's strategy involves a pragmatic progression through semi-solid-state batteries as an intermediate step, balancing practical commercialization with advanced technological development. Their efforts align with China's broader national strategy to lead the new energy vehicle sector, positioning WeLion as a key player in this competitive landscape.

Strategic Significance & Outlook

WeLion's projected 2027 launch of an automotive-grade all-solid-state battery with a 400 Wh/kg energy density could be a transformative event for the EV industry. Achieving this target would bring EV performance metrics, such as range and refueling time, closer to or even exceeding those of traditional internal combustion engine vehicles. This technological leap is expected to intensify competition in the EV market and drive significant shifts across the battery supply chain. Looking ahead, the widespread adoption of higher-density and safer battery technologies will likely extend beyond automotive to various sectors, accelerating the global transition towards sustainable energy solutions.

Source: <https://www.industrialbriefs.com/welion-semi-solid-state-batteries/>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#07 Samsung SDI vs LGES: Solid-state battery timelines for 2027-30

Published October 07, 2026 Business Korea South Korea



OVERVIEW

Leading South Korean battery manufacturers Samsung SDI and LG Energy Solution are pursuing distinct strategies for solid-state battery commercialization. Samsung SDI is accelerating its material supply chain development to commercialize sulfide-based solid-state batteries by 2027. In contrast, LG Energy Solution targets graphite-based solid-state batteries for EVs by 2029 and anode-free solid-state batteries for next-gen applications like humanoid robots by 2030, emphasizing cost competitiveness through advanced dry electrode technology. This dry electrode process aims to significantly reduce equipment, process, and production time compared to existing wet processes.

Key Findings

Samsung SDI and LG Energy Solution, two major South Korean battery manufacturers, have revealed distinct strategic directions for the commercialization of next-generation all-solid-state batteries. Samsung SDI is focusing on sulfide-based solid-state batteries, targeting commercialization by 2027 and rapidly strengthening its material supply chain. In contrast, LG Energy Solution aims to commercialize graphite-based solid-state batteries for electric vehicles (EVs) by 2029, followed by anode-free solid-state batteries for advanced applications like humanoid robots by 2030. LG Energy Solution's strategy prominently features the development of dry electrode technology to secure cost competitiveness.

Technical Details

- **Samsung SDI's Strategy:** Samsung SDI has set an aggressive goal for mass production of sulfide-based all-solid-state batteries by 2027, actively building its supply chain for related materials. Sulfide-based systems are considered among the most promising solid-state battery technologies due to their high ionic conductivity and stability, making them closer to practical application.
- **LG Energy Solution's Strategy:** LG Energy Solution is adopting a more diversified and phased approach. Initially, it aims for commercialization of graphite-based solid-state batteries for EVs by 2029. This represents a technological extension of existing lithium-ion battery technology, allowing for relatively earlier market entry. Subsequently, by 2030, the company plans to commercialize higher-performance anode-free solid-state batteries for next-generation applications such as humanoid robots, pursuing long-term technological leadership.
- **LG Energy Solution's Dry Electrode Technology:** A key component of LG Energy Solution's strategy to reduce high manufacturing costs is the development of dry electrode technology. This innovation eliminates the need for organic solvents and drying processes essential in conventional wet electrode manufacturing, thereby significantly cutting capital expenditure, processing time, and production costs. This is a crucial technological advancement directly impacting the price competitiveness of solid-state batteries.

Background & Context

All-solid-state batteries are heralded as a 'game-changer' for dramatically improving the range, safety, and charging speed of electric vehicles, leading to an intense global development race among battery and automotive manufacturers. Samsung SDI and LG Energy Solution, leveraging their respective technological strengths and market strategies, have chosen different material systems and production approaches. This divergence reflects the nascent stage of solid-state battery technology, where optimal materials and manufacturing processes are still being established. Manufacturing cost, in particular, remains one of the largest barriers to widespread adoption, making LG Energy Solution's dry electrode technology a focal point of industry attention.

Strategic Significance & Outlook

Samsung SDI's aggressive target for early market entry with sulfide-based solid-state batteries could have a significant impact on the EV industry. Meanwhile, LG Energy Solution's phased approach and investment in dry electrode technology aim for broader and longer-term solid-state battery adoption across diverse applications. The potential for humanoid robots and other next-generation mobility and AI devices could open entirely new markets. The contrasting strategies of these two industry giants will be closely watched as they shape the future development of the solid-state battery market. Progress in cost reduction technologies will undoubtedly be critical to the widespread success of solid-state batteries.

Source: <https://www.businesskorea.co.kr/news/articleView.html?idxno=278425>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#08 Gel Electrolyte explained: Li||NCM811 battery stability specs

Published October 08, 2026 EurekAlert! USA



OVERVIEW

A molecularly engineered gel electrolyte has achieved a breakthrough in resolving high-voltage stability and cycle life issues for lithium metal batteries. This electrolyte exhibits an ionic conductivity of 0.78 mS cm^{-1} at 25°C and significantly reduces the Li^{+} desolvation activation energy to 38.9 kJ mol^{-1} . $\text{Li}||\text{Li}$ symmetric cells operated stably for over 1000 hours, and $\text{Li}||\text{NCM811}$ cells achieved a high capacity of 157.7 mAh g^{-1} at 2C, retaining 81.7% capacity after 500 cycles (compared to 73.5% with conventional liquid electrolytes). This technology promises enhanced performance for EVs and portable devices.

Key Findings

A novel gel electrolyte, developed through molecular engineering, has successfully achieved a dramatic improvement in the stability and cycle life of lithium metal batteries under high-voltage conditions. This electrolyte demonstrates a high ionic conductivity of 0.78 mS cm^{-1} at 25°C and significantly lowers the Li^+ desolvation activation energy to 38.9 kJ mol^{-1} . Consequently, $\text{Li}||\text{Li}$ symmetric cells achieved over 1000 hours of stable operation, and $\text{Li}||\text{NCM811}$ cells exhibited 81.7% capacity retention after 500 cycles, substantially outperforming conventional liquid electrolytes (73.5%) under similar conditions.

Technical Details

- **Molecular Engineering of Electrolyte:** The research team meticulously designed the molecular structure of the electrolyte to optimize lithium ion transport and suppress parasitic side reactions at the electrode interfaces. This approach specifically enhanced electrolyte stability under high-voltage conditions.
- **High Ionic Conductivity and Low Activation Energy:** The developed gel electrolyte boasts an excellent ionic conductivity of 0.78 mS cm^{-1} at 25°C . Furthermore, by significantly reducing the Li^+ desolvation activation energy to 38.9 kJ mol^{-1} , lithium ions can move more efficiently and rapidly through the electrolyte, contributing to enhanced fast-charging capabilities.
- **Improved Lithium Metal Stability:** Evaluations using $\text{Li}||\text{Li}$ symmetric cells confirmed stable lithium plating/stripping cycling for over 1000 hours at a current density of 0.5 mA cm^{-2} and an areal capacity of 0.5 mAh cm^{-2} . This indicates effective suppression of lithium metal dendrite formation and stable interfacial layer formation.
- **Superior Performance in NCM811 Cells:** In $\text{Li}||\text{NCM811}$ cells utilizing the high-energy-density NCM811 ($\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$) cathode, a capacity of 157.7 mAh g^{-1} was achieved at a high discharge rate of 2C. Moreover, the cells maintained 81.7% capacity after 500 cycles under 0.5C charge/1C discharge conditions, significantly surpassing the 73.5% observed with conventional liquid electrolytes under the same conditions.

Background & Context

Lithium metal batteries are highly anticipated as next-generation energy storage devices due to their energy density, which far exceeds that of existing lithium-ion batteries. However, their practical application has been hindered by safety issues arising from dendrite formation and short cycle life. Especially when paired with nickel-rich cathodes like NCM811, which enable high voltages, electrolyte stability becomes even more critical. The gel electrolyte developed in this study addresses these fundamental challenges through molecular-level design, demonstrating the potential for both high energy density, improved safety, and extended lifespan.

Strategic Significance & Outlook

The development of this molecularly engineered gel electrolyte is poised to significantly contribute to extending the range and reducing charging times for electric vehicles, as well as enhancing the battery life of portable electronic devices such like smartphones and laptops. Its ability to maintain over 80% capacity after 500 cycles accelerates its applicability to practical products. As further material optimization and manufacturing process scale-up progress, this technology holds the potential to become a key player in the next-generation battery market. This breakthrough is expected to usher in a new era for energy storage technology and garner considerable attention from the entire industry.

Source: <https://www.eurekalert.org/news-releases/1146949>

#09 PTFE-Free Dry Electrode: Korean EV battery charging specs 2026

Published October 05, 2026 Tech Briefs South Korea



OVERVIEW

Korean researchers have developed a novel PTFE-free dry electrode technology, promising significant improvements in EV battery charging speed and driving range. This innovation, combining shape-controlled graphite granules with commercial CMC-SBR binders, achieves superior fast-charging performance and long-term cycle stability. It also enhances lithium-ion diffusion under high-energy-density conditions. The technology offers advantages in reducing manufacturing costs and carbon emissions compared to conventional wet processes, overcoming a key challenge where many existing dry electrode approaches rely on PTFE.

Key Findings

A team of Korean researchers has unveiled a groundbreaking PTFE (polytetrafluoroethylene)-free dry electrode technology. This innovative method promises to significantly shorten charging times and extend the driving range of electric vehicle (EV) batteries. By combining shape-controlled graphite granules with commercial CMC-SBR binders, the technology achieves excellent fast-charging performance and long-term cycle stability, alongside improved lithium-ion diffusion characteristics under high-energy-density conditions.

Technical Details

- **PTFE-Free Dry Electrode Technology:** The developed dry electrode technology is revolutionary in its avoidance of PTFE, a material commonly used in conventional dry electrode manufacturing. PTFE has been associated with environmental concerns and manufacturing complexities, making alternative technologies highly sought after in the industry.
- **Shape-Controlled Graphite Granules and CMC-SBR Binder:** This technology employs graphite granules with precisely controlled shapes as the anode material, utilizing commercial-grade CMC (carboxymethyl cellulose) and SBR (styrene-butadiene rubber) as binders. This optimized electrode structure facilitates enhanced lithium-ion transport.
- **Superior Fast-Charging Performance:** The new dry anode demonstrated a significant improvement in fast-charging capabilities. This enables substantially shorter charging times for electric vehicles, boosting user convenience.
- **Long-Term Cycle Stability:** The developed dry electrodes maintained stable performance over extended charge-discharge cycles, contributing to increased battery lifespan and reliability.
- **Improved Lithium-Ion Diffusion at High Energy Density:** Lithium-ion diffusion characteristics within the electrode were notably enhanced even under high-energy-density conditions. This is a critical factor for achieving high-power and high-capacity batteries.

Background & Context

The widespread adoption of electric vehicles is contingent on battery performance, cost, and the sustainability of manufacturing processes. Conventional wet electrode manufacturing processes are energy-intensive and costly due to their reliance on organic solvents and extensive drying requirements, also posing environmental burdens. Dry electrode technology has emerged as a promising next-generation manufacturing method to address these challenges, but many existing approaches have relied on specific polymeric materials like PTFE. This research's PTFE-free approach is environmentally friendlier, offers broader material choices, and provides significant cost-reduction potential, set to make a major impact on the industry.

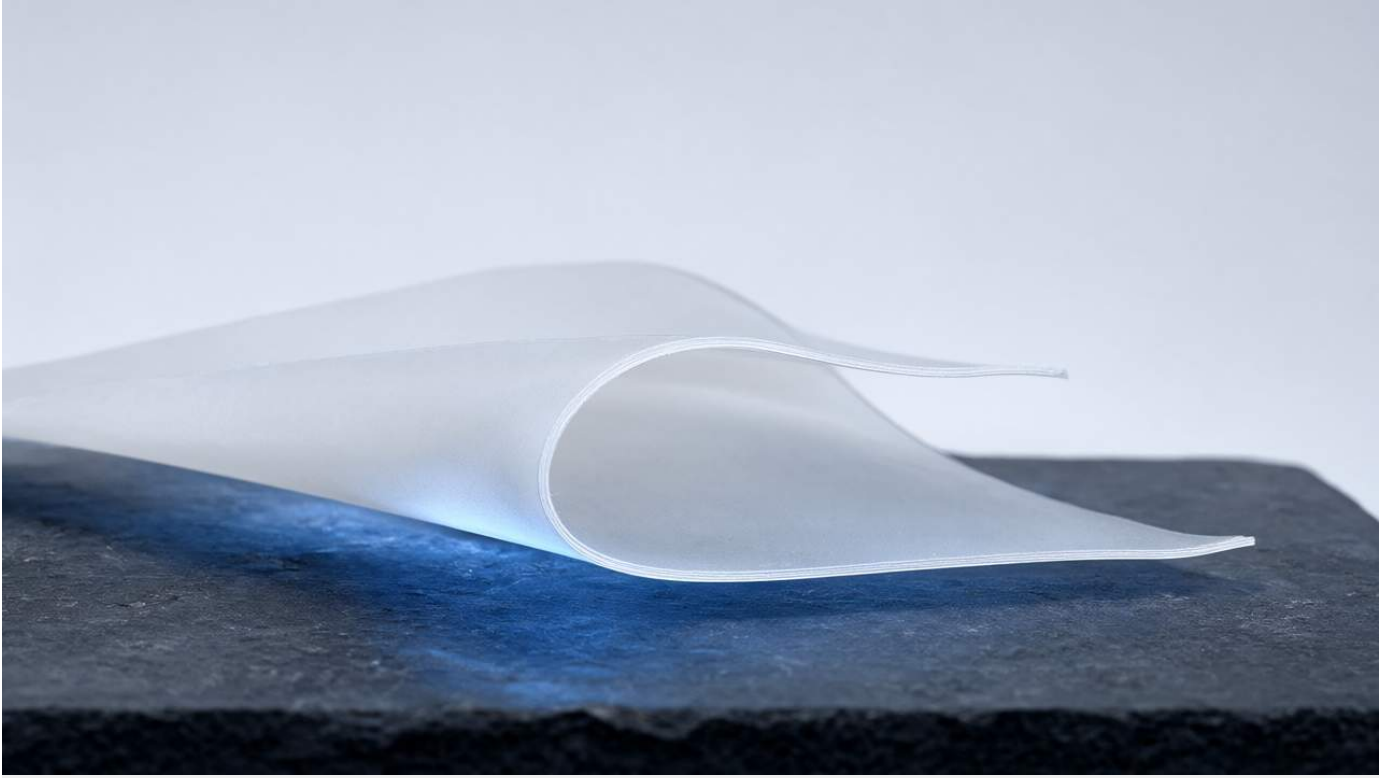
Strategic Significance & Outlook

This PTFE-free dry electrode technology holds the potential to instigate a paradigm shift in EV battery manufacturing. Shorter charging times and extended driving ranges will dramatically increase consumer acceptance of EVs. Furthermore, reductions in manufacturing costs and carbon emissions will contribute to the overall sustainability of the battery industry. As this technology scales up and moves towards commercialization, it is expected to bring about significant changes in the competitive landscape of next-generation batteries, accelerating the adoption of higher-performing and more environmentally friendly EVs.

Source: <https://www.techbriefs.com/component/content/article/55990-faster-charging-and-increased-driving-range-with-dry-electrodes>

#10 ProLogium SFIE DCN: Solid-state electrolyte 6.4-min charge specs

Published October 08, 2026 EV Magazine Taiwan



OVERVIEW

ProLogium has introduced its innovative DCN (Dynamic Cross-linking Network) electrolyte, SFIE, demonstrating an ionic conductivity of up to 57 mS/cm at room temperature and high lithium-ion transference number. Batteries utilizing SFIE achieve a 5% to 80% charge in a mere 6.4 minutes, endure over 1,000 fast-charge cycles, and maintain over 90% capacity at -20°C. The SFIE integrates an Active Safety Mechanism (ASM) that initiates passivation at approximately 125°C to prevent thermal runaway, making it a pivotal advancement for high-performance, safe EV batteries.

Key Findings

ProLogium has announced a significant advancement with its new DCN (Dynamic Cross-linking Network) electrolyte, dubbed SFIE (Superfluidized Inorganic Next-Generation Lithium Ceramic Battery). This breakthrough solid-state electrolyte exhibits an impressive ionic conductivity of up to 57 mS/cm at room temperature and a high lithium-ion transference number, addressing key challenges in solid-state battery performance. Internal testing reveals that SFIE-based batteries can achieve an ultra-fast charge from 5% to 80% in just 6.4 minutes, withstand over 1,000 fast-charge cycles, and retain over 90% capacity even at a challenging -20°C.

Technical / Clinical Details

The SFIE electrolyte leverages proprietary DCN technology, endowing it with non-Newtonian fluid characteristics. This unique property enables the formation of adaptive interfaces between the electrolyte and electrodes, which reduces reliance on high stack pressure—a common hurdle in solid-state battery manufacturing. This adaptability facilitates higher-rate charging and enhances manufacturing scalability. Crucially, SFIE incorporates an Active Safety Mechanism (ASM) designed to induce passivation at approximately 125°C, effectively interrupting thermal runaway and significantly boosting battery safety. This safety feature further strengthens the inherent safety advantages of solid-state batteries over conventional liquid-electrolyte lithium-ion counterparts.

Background & Context

The electric vehicle (EV) market is aggressively pursuing solutions for extended range, faster charging, and enhanced safety. ProLogium's SFIE technology offers a comprehensive answer to these demands, potentially revolutionizing the EV user experience. The company is actively collaborating with Mercedes-Benz for priority testing of its Gen4 cells and is showcasing modules and prototypes with partners like FEV and OPmobility, underscoring strong industry interest. ProLogium operates GWh-scale Taoyuan production lines in Taiwan and is constructing a gigafactory in Dunkirk, France, signaling its ambition for global mass production.

Strategic Significance & Outlook

The SFIE technology is poised to be a game-changer for EV adoption by dramatically improving charging convenience and reducing demands on charging infrastructure. Its combination of rapid charging, wide operating temperature range, and integrated safety mechanisms appeals to both consumers and commercial fleet operators. The establishment of large-scale production facilities in Taiwan and France indicates ProLogium's strategic intent to capture a leading position in the global solid-state battery market. Beyond EVs, the SFIE technology could find applications in various sectors, including stationary energy storage and aerospace, marking a significant step forward for advanced battery technology.

Source: <https://markets.businessinsider.com/news/stocks/prologium-unveils-dcn-opening-a-third-state-electrolyte-universe-at-paris-motor-show-1036608719>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#11 Honda solid-state batteries: EV range specs and 2028 timeline

Published October 06, 2026 Connector Supplier Japan



OVERVIEW

Honda has announced the development of a proprietary manufacturing process for solid-state batteries intended for electric vehicles (EVs), with plans for implementation within the next two years. This next-generation battery technology promises an ultra-long driving range of 700-900 miles (approximately 1,126-1,448 km) on a single charge and significantly reduced charging times. New manufacturing processes are expected to drive down costs, making these advanced batteries viable for the consumer market.

Key Findings

Honda has announced a breakthrough in its electric vehicle (EV) strategy with the establishment of a proprietary manufacturing process for solid-state batteries. This advanced battery technology is poised to deliver an impressive driving range of 700-900 miles (approximately 1,126-1,448 km) on a single charge. Honda plans to integrate these solid-state batteries into its EVs within the next two years, signaling a rapid acceleration towards next-generation electric mobility, complete with ultra-fast charging capabilities.

Technical / Clinical Details

Honda's solid-state battery technology is designed to fundamentally address the limitations of conventional liquid-electrolyte lithium-ion batteries, particularly in energy density, safety, and charging speed. By utilizing a solid electrolyte, the inherent risk of thermal runaway and fire is substantially reduced, leading to enhanced safety and reliability. The newly developed manufacturing process is specifically aimed at achieving significant cost reductions in battery production. This cost-efficiency is crucial for making high-performance solid-state batteries accessible to the mainstream consumer market, a vital step for accelerating EV adoption globally.

Background & Context

As the automotive industry pivots towards electrification, range anxiety and charging times remain primary concerns for potential EV buyers. Honda's solid-state battery technology seeks to alleviate these concerns, offering EVs comparable, if not superior, convenience to gasoline-powered vehicles. With global automotive giants like Toyota and Samsung SDI intensely competing in solid-state battery development, Honda's establishment of its own manufacturing process underscores its strategic intent to secure a competitive edge in the evolving EV landscape.

Strategic Significance & Outlook

Honda's commitment to deploying solid-state batteries in its EVs within two years marks a critical step towards solidifying its leadership in the EV sector. The promise of ultra-long range and ultra-fast charging will dramatically improve the practicality and desirability of EVs for daily use and long-distance travel, appealing to a broader consumer base that may have previously hesitated to adopt electric vehicles. If cost-effective manufacturing can be sustained, solid-state batteries are set to become a dominant force in the EV market, significantly contributing to the realization of sustainable mobility worldwide.

Source: <https://connectorsupplier.com/connecting-the-next-generation-of-ev-batteries/>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#12 Solid-state batteries: Toyota, BYD and Hyundai 2027-2030 roadmap

Published October 03, 2026 BigGo Finance South Korea



OVERVIEW

Hyundai Motor Group is establishing a solid-state battery pilot line targeting commercial mass production by 2030. Toyota, in collaboration with Idemitsu Kosan, aims for mass production as early as 2027-2028. Nissan plans commercialization for fiscal year 2028, while BYD outlines a roadmap for pilot vehicle production in Q1 2027, mass production in 2028, and mainstream adoption post-2030.

Key Findings

Major automotive and battery manufacturers, including Hyundai Motor Group, Toyota, Nissan, and BYD, are significantly ramping up their efforts in solid-state battery technology, unveiling concrete roadmaps and aggressive production timelines. A notable trend is the concentration of pilot production line constructions and commercialization targets between 2027 and 2030, signaling an intensifying race to market.

Technical / Clinical Details

Hyundai Motor Group is actively constructing a solid-state battery pilot production line at its Uiwang research center, with a stated goal of achieving commercial mass production around 2030. Toyota, in a strategic collaboration with Japanese petrochemical giant Idemitsu Kosan, is pursuing solid-state battery research and aims to commence mass production as early as 2027–2028. Nissan is also investing in its Yokohama plant, establishing a pilot production line with commercialization targeted for fiscal year 2028 (April 2028–March 2029). Chinese electric vehicle and battery manufacturer BYD has announced an even more ambitious timeline, planning to initiate pilot production of solid-state battery-equipped vehicles in Q1 2027, transition to mass production in 2028, and achieve mainstream adoption of the technology after 2030.

Background & Context

Solid-state batteries offer substantial advantages over conventional liquid-electrolyte lithium-ion batteries, including enhanced safety by eliminating flammable liquids, higher energy density for extended range, and potentially longer lifespans. These improvements are crucial for widespread electric vehicle adoption, addressing critical consumer concerns like thermal runaway risks. The current focus on building pilot production lines reflects the industry's recognition that mastering scalable manufacturing techniques and significantly reducing production costs are the primary hurdles to widespread commercial deployment. The transition from laboratory research to high-volume manufacturing involves complex challenges in materials sourcing, process engineering, and quality control.

Strategic Significance & Outlook

The clear and aggressive targets set by these leading players indicate that solid-state battery commercialization is rapidly approaching. Asian automotive and battery manufacturers are driving this development race, with significant technological breakthroughs and cost reductions anticipated in the coming years. Success in these endeavors could fundamentally reshape the electric vehicle landscape, setting new benchmarks for performance, safety, and charging infrastructure. Furthermore, this technological shift will likely create new supply chain dynamics and market opportunities, impacting not only the automotive sector but also broader energy storage applications globally.

Source: <https://finance.biggo.com/news/fd1548d8-1522-43b3-98dd-1b590f1a010f>

Collected: October 09, 2026 | Automated Research System (Gemini API)

#13 China battery blueprint: Solid-state application timeline for 2030

Published October 02, 2026 Energy-Storage.news China



OVERVIEW

China has set a national objective for the initial large-scale application of all-solid-state batteries by 2030, as part of its first national development plan for the battery industry (2026-2030). The plan targets breakthroughs in advanced electrode materials, new electrolytes, and specialized auxiliary materials, aiming for 15,000 charging cycles for long-life lithium batteries and reducing defect rates to parts-per-billion levels by 2030.

Key Findings

China has declared a national objective to achieve the initial large-scale application of all-solid-state batteries by 2030, embedded within its inaugural national development plan for the battery industry, spanning 2026 to 2030.

Technical / Clinical Details

This comprehensive national blueprint specifically aims for significant breakthroughs in advanced electrode materials, novel electrolytes, and specialized auxiliary materials crucial for next-generation batteries. Beyond all-solid-state technology, the plan also sets ambitious targets for long-life lithium batteries, seeking to achieve 15,000 charging cycles and dramatically reduce defect rates at leading manufacturers to parts-per-billion levels by 2030. The strategy encompasses a broad spectrum of considerations, including the development of specialized all-solid-state manufacturing equipment, robust safety protocols, enhanced all-weather performance, establishment of technical standards, and strengthening of intellectual property protection. This holistic approach underscores China's commitment to dominating the entire battery value chain, from fundamental research to industrial deployment and global competitiveness.

Background & Context

As the world's largest battery producer and a leader in the electric vehicle (EV) market, China is acutely aware of the intense international competition in next-generation battery technologies, particularly from established players in Japan and South Korea. This national plan represents a strategic maneuver by China to solidify its leadership in this critical technological domain and secure its competitive edge in the future energy storage market. Through substantial policy support and strategic investments in domestic industries, China intends to accelerate innovation and enhance its position within the global supply chain for advanced batteries.

Strategic Significance & Outlook

This powerful governmental endorsement is expected to significantly accelerate research, development, and commercialization efforts for all-solid-state batteries in China. Advances in material science, optimization of manufacturing processes, and the implementation of stringent quality control standards could position China as a dominant supplier of solid-state batteries by 2030. Furthermore, the ambitious targets for extended lifespan and dramatic defect rate reduction will enhance battery reliability and sustainability, promoting broader applications beyond EVs, such as in grid-scale energy storage systems. This strategic initiative is poised to exert a profound influence on the global energy transition landscape.

Source: <https://newenergyweekly.co.uk/china-targets-solid-state-battery-scale-up-by-2030-in-first-national-blueprint/>

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#14 Macsen Energy sodium-ion cells: Prussian White cathode specs

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OVERVIEW

Indian startup Macsen Energy announced its sodium-ion battery cell, featuring a proprietary Prussian white cathode material, exceeded 1,500 charge-discharge cycles in lab tests, retaining 90% of initial capacity after 1,000 cycles. The cathode reports a specific capacity exceeding 150 mAh/g, 99.9% coulombic efficiency, and good air stability. Macsen plans a tonne-scale Prussian blue analogue cathode production facility in 2027.

Key Findings

Indian startup Macsen Energy has announced a significant breakthrough in sodium-ion battery technology, with its cell, utilizing a proprietary Prussian white cathode material, demonstrating over 1,500 charge-discharge cycles in laboratory testing. This achievement marks a substantial advancement in the commercial viability of sodium-ion batteries as a next-generation alternative to lithium-ion.

Technical / Clinical Details

Macsen Energy's sodium-ion battery cell exhibited exceptional cycle life, retaining 90% of its initial capacity even after 1,000 cycles. This long-duration performance is crucial for applications demanding high durability, such as energy storage systems and electric vehicles. The company's proprietary cathode material boasts a specific capacity exceeding 150 mAh/g and an impressively high coulombic efficiency of approximately 99.9%, indicating highly efficient energy utilization during charge and discharge processes. Furthermore, the material demonstrates good air stability, which offers advantages in manufacturing and handling. Macsen Energy is actively planning the construction of a tonne-scale production facility for its Prussian blue analogue cathode material, slated for 2027, signaling concrete steps towards commercialization.

Background & Context

The uneven distribution and volatile pricing of lithium resources, along with the environmental impact of its extraction, are major concerns for the current lithium-ion battery industry. In contrast, sodium is an abundant and inexpensive element globally, making sodium-ion batteries a compelling alternative technology. Prussian blue analogues are particularly well-suited as cathode materials due to their structural characteristics, which facilitate efficient sodium-ion intercalation and deintercalation, offering an excellent balance of cost and performance. Macsen Energy's breakthrough suggests that sodium-ion batteries are not merely a substitute but are emerging as a practical, high-performance option for the market.

Strategic Significance & Outlook

The reported cycle life of over 1,500 cycles and high capacity retention after 1,000 cycles for Macsen Energy's sodium-ion battery indicate that this technology is reaching a competitive level against lithium-ion batteries for traditional applications. The planned construction of a tonne-scale production facility in 2027 underscores the company's strong commitment to deploying this technology at a commercial scale, potentially positioning India as a source of cost-effective, high-performance batteries. This development is expected to offer new options for the global energy storage market and contribute to the establishment of sustainable energy systems. The market introduction of sodium-ion batteries will also promote diversification of the battery supply chain, influencing global energy security.

Source: <https://www.pv-magazine.com/2026/10/06/indian-startup-claims-over-1500-cycles-for-sodium-ion-cell-with-prussian-white-cathode/>

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#15 CALB and Gotion High-Tech: Solid-state battery pilot line specs

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OVERVIEW

Chinese battery manufacturers CALB and Gotion High-Tech are making significant strides in high-energy-density solid-state battery development. CALB has established a dedicated pilot production capacity for automotive, robotics, and aircraft applications. Gotion High-Tech unveiled a solid-state cell with approximately 400Wh/kg energy density and is developing a 2GWh production line. While test vehicles are anticipated by late 2026-2027, an academician from the Chinese Academy of Sciences projects large-scale production will likely take another 3-5 years, tempering immediate commercialization expectations.

Key Findings

Leading Chinese battery manufacturers CALB and Gotion High-Tech are demonstrating significant progress in the development of high-energy-density solid-state batteries. CALB has successfully established a dedicated pilot production capacity tailored for diverse applications including automotive, robotics, and aircraft. Concurrently, Gotion High-Tech has disclosed a solid-state cell boasting an energy density of approximately 400 Wh/kg and has initiated the development of a 2GWh production line, underscoring China's determined push towards the industrialization of solid-state battery technology.

Technical / Clinical Details

CALB's solid-state battery technology is being developed with a focus on high-performance sectors such as electric vehicles (EVs), autonomous mobile robots, and aviation. These applications demand not only extended range and operating times enabled by high energy density but also paramount safety and long cycle life. Gotion High-Tech's 400 Wh/kg solid-state cell represents a substantial improvement in energy density over current EV batteries, promising to significantly enhance EV range. The development of a 2GWh production line signifies a tangible move towards mass production, transitioning the technology from laboratory prototypes to industrial-scale manufacturing. This capacity suggests a strategic pathway to overcome initial scalability challenges inherent in new battery technologies.

Background & Context

China has strategically prioritized the advancement of its next-generation battery industry, aiming for initial large-scale deployment of solid-state batteries by 2030. This robust governmental support, coupled with substantial corporate investment, is fueling the rapid R&D efforts of domestic companies like CALB and Gotion High-Tech. Ouyang Minggao, an academician from the Chinese Academy of Sciences, anticipates that test vehicles equipped with solid-state batteries could emerge between late 2026 and 2027. However, he offers a pragmatic view, stating that true large-scale production is "likely to take another three to five years." This realistic timeline reflects the intricate challenges of industrialization, including optimizing manufacturing processes, achieving cost competitiveness, and establishing resilient supply chains, beyond mere technical feasibility.

Strategic Significance & Outlook

The advancements by CALB and Gotion High-Tech are crucial for China's ambition to secure global leadership in solid-state battery technology. The introduction of test vehicles will serve as an early validation of practical applicability. Nevertheless, the primary focus for the coming years will be on perfecting production techniques and achieving cost parity with existing battery solutions. With continued government impetus and private sector investment, China is expected to build a formidable competitive edge in the solid-state battery market. Successful large-scale production promises to revolutionize a wide array of industries, from electric mobility (EVs, drones) to future electric aircraft, setting new benchmarks for energy storage technologies globally.

Source: <https://www.chinadaily.com.cn/a/202610/08/WS6ac6d59de4b06d4aa0561911.html>

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