

SolidStateBattery

Weekly Intelligence Report

2026-07-12 | 24 articles | 7 countries

troy-technical.jp

This Week's Keyword

Solid-State Race Heats

China, US, EU accelerate commercialization

24

articles

Total Articles Analyzed

7

countries

Source Countries/Regions

500 Wh/kg

Peak Energy Density

72 sec

Fastest Charge Time

All 24 Articles This Week — 5-Axis Evaluation Matrix

How to read columns — Tech Novelty: degree of breakthrough Market Proximity: closeness to commercialization Market Impact: industry-wide effect Data Reliability: quantitative data & peer review US/EU Relevance: direct impact on US/European companies & supply chains

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#01	Novel Halide SE Boosts	Research						Novel halide solid electrolytes show high ionic conductivity and interfacial stability for Li metal anodes.
#02	Scalable Sulfide SE Mfg	Research /Mfg						Scalable manufacturing process for sulfide solid electrolytes achieves high ionic conductivity and stability for EVs.
#03	Toyota Pilot Line for EV	Corporate Strategy						Toyota launches new pilot line to accelerate mass production of all-solid-state EV batteries.
#04	QuantumScape Anode-Free	Corporate Strategy						QuantumScape achieves major breakthrough in anode-free solid-state cell performance: enhanced cycle life and rapid charging.
#05	LLZO Oxide SE Coating	Research						Novel surface coating dramatically reduces interfacial resistance in LLZO oxide solid electrolytes.
#06	Samsung SDI Roadmap	Corporate Strategy						Samsung SDI updates all-solid-state battery roadmap, targeting 2027 EV integration with high energy density and safety.
#07	Gel Polymer Electrolytes	Research						Gel polymer electrolytes with high ionic conductivity and mechanical strength enable flexible quasi-solid-state batteries.
#08	Dry Electrode Mfg Process	Research /Mfg						Dry electrode manufacturing process for all-solid-state batteries established, reducing costs and environmental impact.
#09	NEDO Japan Consortium	Policy/Strategy						NEDO funds new Japanese consortium to accelerate all-solid-state battery mass production and supply chain strengthening.
#10	Protective Layer Dendrite	Research						Novel protective layer design suppresses dendrite growth on lithium metal anodes, enhancing safety and cycle life.
#11	Bipolar ASSB Stacks	Research						Bipolar all-solid-state battery stacks demonstrate fast charging, combining high power density with efficient thermal management.
#12	ProLogium EU OEM Partn	Partnership						ProLogium announces strategic partnership with leading European OEM for solid-state EV integration, targeting late 2020s.

#	Article Title	Type	Tech Novelty	Market Proximity	Market Impact	Data Reliability	US/EU Relevance	Summary
#13	Halide-Rich Argyrodite	Research	●●●●○ ○	●○○○○ ○	●●●●○ ○	●●●●○ ○	●●●●○ ○	Newly developed halide-rich argyrodite electrolyte enhances low-temperature performance and cycle life of all-solid-state batteries.
#14	CATL Semi-Solid-State	Corporate Strategy	●●●●○ ○	●●●●● ○	●●●●● ○	●●●●○ ○	●●●●● ○	CATL expands semi-solid-state battery mass production capacity by retrofitting EV battery lines.
#15	US DOE Recycling Grant	Policy	●●○○○ ○	●●○○○ ○	●●●●○ ○	●●○○○ ○	●●●●● ●	U.S. Department of Energy establishes new grant program for all-solid-state battery recycling technologies.
#16	Novel Cathode Coating	Research	●●●●● ○	●○○○○ ○	●●●●○ ○	●●●●○ ○	●●●●○ ○	Novel cathode coating technology reduces interfacial resistance, dramatically extending cycle life of all-solid-state batteries.
#17	ULVAC Deposition System	New Product/Mfg	●●●●● ○	●●●●● ○	●●●●● ○	●●●●○ ○	●●●●● ○	ULVAC unveils new deposition system for thin-film solid electrolytes, advancing mass production and cost reduction.
#18	Dongfeng 50k SSBEVs	Corporate Strategy	●●●●● ○	●●●●● ●	●●●●● ●	●●●●● ○	●●●●● ○	Dongfeng to deploy 50,000 solid-state battery EVs by 2027, initiating mass production of 350Wh/kg cells in Sept 2026.
#19	GBT 500 Wh/kg SSBs	Corporate Strategy	●●●●● ●	●●●●● ●	●●●●● ●	●●●●○ ○	●●●●● ○	Greater Bay Technology to launch world's first industrial-scale 500 Wh/kg solid-state battery by 2026 for GAC Hyptec premium EVs.
#20	Quaternary Alloy Anode	Research	●●●●● ●	●○○○○ ○	●●●●● ●	●●●●● ●	●●●●● ●	Novel quaternary alloy anode enables ultra-rapid charging all-solid-state batteries: 72-second full charge, 80% capacity retention after 2,050 cycles.
#21	Solid Power Production	Corporate Strategy	●●●●○ ○	●●●●● ○	●●●●● ○	●●●●● ○	●●●●● ●	Solid Power accelerates solid-state electrolyte production to 75 metric tons by 2026-end, bolstered by BMW & SK On partnerships.
#22	Samsung SDI Samples	Corporate Strategy	●●●●○ ○	●●●●● ○	●●●●● ○	●●●●○ ○	●●●●● ○	Samsung SDI's solid-state battery samples receive positive global customer feedback, targeting 2027 H2 mass production.
#23	Argyrium/Ilika Mileston	Industry Report	●●●●○ ○	●●●●● ○	●●●●● ○	●●●●○ ○	●●●●● ●	European Argyrium to industrialize solid electrolytes, Ilika ships automotive prototypes: key milestones advance solid-state battery commercialization.
#24	ProLogium SPAC/Dunkirk	Corporate Strategy	●●●●○ ○	●●●●● ○	●●●●● ○	●●●●○ ○	●●●●● ●	ProLogium to go public via SPAC merger, targets 4GWh solid-state battery production by 2030 at Dunkirk Gigafactory; partners with OPmobility.

●●●●○ High ●●●○○○ Med-High ●●○○○○ Med ●○○○○○ Low | Yellow highlight = featured article

Three Questions That Demand Your Decision This Week

❶ Is your EV platform ready for 500 Wh/kg batteries?

Chinese firms like GBT claim industrial-scale 500 Wh/kg solid-state batteries by 2026, doubling current EV range. Does your product roadmap account for this aggressive performance leap, or risk rapid obsolescence?

❷ Can your supply chain secure critical solid electrolyte materials?

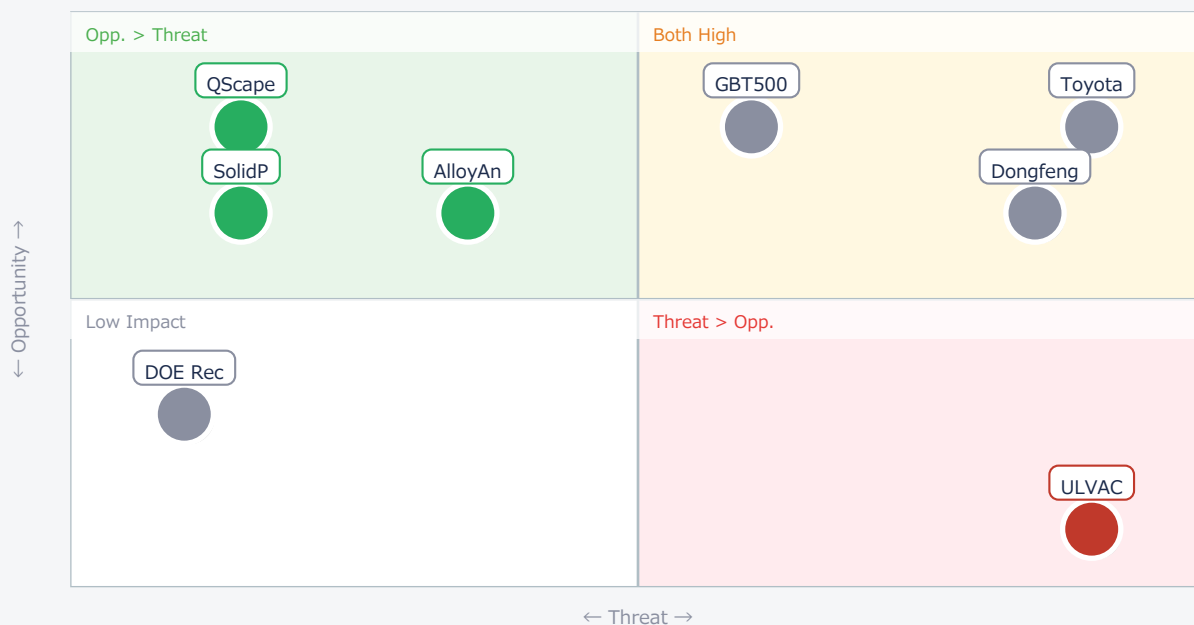
With Japan's NEDO funding consortia and Europe's Argyllium industrializing sulfide electrolytes, competition for key materials is intensifying. Have you diversified sourcing and invested in domestic capabilities to avoid future bottlenecks?

❸ Are US/EU manufacturing processes competitive for solid-state?

Japan's ULVAC and novel dry electrode processes promise cost reduction and scalability. Are your manufacturing partners adopting these advanced techniques, or are they falling behind Asian competitors in efficiency and cost?

Opportunities vs. Threats for US/European Companies

Opportunity vs. Threat Matrix for US/European Companies



Item	Quadrant	↑ Opportunity	↓ Threat
● GBT500	Critical	New EV benchmarks	China market lead
● Dongfeng	Critical	EV market growth	China EV dominance
● Toyota	Critical	ASB tech validation	Japanese lead
● QScape	Opp.	US tech leadership	—
● AlloyAn	Opp.	Ultra-fast charge	—
● SolidP	Opp.	Supply chain role	—
● ULVAC	Threat	—	Japan mfg lead

● DOE Rec	Ref.	Sustainable chain	—
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Deep Dive ① — China's GBT Claims 500 Wh/kg SSB by 2026

#19 | 2026/07/02 | China GBT | Tech Novelty●●●●● Proximity●●●●● Market Impact●●●●● Data Reliability●●●●○ US/EU Relevance●●●●○

Greater Bay Technology (GBT) announced plans for industrial-scale production of 500 Wh/kg solid-state batteries by 2026, targeting GAC Hyptec's premium EVs. This ultra-high energy density, nearly double current Li-ion, promises significant EV range extension and ultra-fast charging.

GBT's proprietary composite solid electrolyte is key to achieving enhanced safety and performance, virtually eliminating thermal runaway risks. This aggressive timeline and performance claim from a Chinese player sets a new, challenging benchmark for the global EV battery market.

► Strategic Analyst's Perspective

Strategic Analyst's Perspective: The 500 Wh/kg claim is extremely ambitious and likely represents peak lab performance under ideal conditions, not sustained real-world average. Technical barriers include long-term stability at such high energy densities and scalable manufacturing of the composite solid electrolyte. [Opportunity] for US/EU OEMs to push their suppliers for similar performance, or partner with GBT if validated. [Threat] is China establishing a dominant lead in next-gen EV battery performance, potentially making current US/EU EV platforms less competitive. Next actions: [R&D;] Validate GBT's claims via independent analysis by Q4 2026. [Strategy] Develop contingency plans for EV roadmap acceleration by Q1 2027.

Deep Dive ② — US Research: Ultra-Rapid Charging Anode

#20 | 2026/07/08 | ACS Sustainable Chemistry & Engineering | Tech Novelty●●●●● Proximity●○○○○ Market Impact●●●●● Data Reliability●●●●● US/EU Relevance●●●●●

US researchers engineered a quaternary Li-Al-Si-Zn alloy anode (ASZ@Li) enabling ultra-rapid charging all-solid-state batteries. Full cells achieved charge-discharge within 72 seconds at 50 C, maintaining 80% capacity after 2,050 cycles at 20 C.

This breakthrough addresses sluggish Li-ion transport and solid-solid interface degradation, critical challenges for fast charging and cycle life. The multiphase alloy structure boosts electron-ion co-conductivity and suppresses dendrite growth, demonstrating exceptional durability.

► Strategic Analyst's Perspective

Strategic Analyst's Perspective: The published numbers are highly reliable given the peer-reviewed source and specific quantitative data. However, this is basic research; scaling this novel alloy anode material and integrating it into commercial-scale solid-state cells presents significant technical and cost barriers. [Opportunity] for US/EU materials suppliers and battery developers to license or acquire this foundational IP for future product differentiation in ultra-fast charging. [Threat] is missing out on this fundamental material science advantage, allowing competitors to integrate it first. Next actions: [R&D;] Initiate internal R&D; programs to replicate and optimize this anode chemistry by Q4 2026. [Legal/IP] Conduct IP landscape analysis around quaternary alloy anodes by end of Q3 2026.

Deep Dive ③ — QuantumScape's Anode-Free Cell Breakthrough

#04 | 2026/07/09 | QuantumScape Company Press Release | Tech Novelty●●●●○ Proximity●●●●○ Market Impact●●●●● Data Reliability●●●●○ US/EU Relevance●●●●●

QuantumScape announced a major breakthrough in its anode-free all-solid-state battery cells, demonstrating over 90% capacity retention after 800 cycles and 0-80% charge in under 15 minutes. This significantly enhances cycle life and fast-charging capabilities.

The anode-free design maximizes energy density by directly utilizing lithium metal. This progress suggests QuantumScape's proprietary solid-electrolyte technology has effectively overcome critical dendrite formation challenges, accelerating commercialization for the EV market.

► Strategic Analyst's Perspective

Strategic Analyst's Perspective: The performance data from QuantumScape is specific and impressive, indicating significant progress towards commercial viability. While a press release, the detailed metrics lend credibility. The primary technical barrier remains scaling this complex anode-free design for mass production at competitive costs. [Opportunity] for US/EU OEMs to leverage QuantumScape's technology through existing partnerships (e.g., VW) to gain a competitive edge in EV performance. [Threat] for other US/EU battery developers if QuantumScape's technology proves superior and scalable, potentially making their platforms obsolete. Next actions: [Business Dev] Re-evaluate QuantumScape's partnership terms and potential for broader licensing by Q3 2026. [R&D;] Benchmark internal anode-free development against QuantumScape's published metrics by Q4 2026.

Other Notable Articles

Toyota Initiates New Pilot Line to Accelerate Mass Production of All-Solid-State EV Batteries (Electrive.com)

Tech Novelty●●●○○ Proximity●●●○○ Market Impact●●●●○

Toyota's pilot line signals aggressive move towards mass production, setting a high bar for other OEMs.

Dongfeng to Deploy 50,000 Solid-State Battery EVs by 2027, Initiating Mass Production of 350Wh/kg Cells in September 2026 (ChinaEVHome)

Tech Novelty●●●●○ Proximity●●●●● Market Impact●●●●●

Dongfeng's aggressive deployment plan highlights China's rapid commercialization of solid-state EVs, a major competitive threat.

European Argylum to Industrialize Solid Electrolytes, Ilika Ships Automotive Prototypes: Key Milestones Advance Solid-State Battery Commercialization (Industry Insights/Report)

Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●○

Europe's strategic moves in solid electrolyte industrialization and prototype shipments indicate strong regional progress.

Solid Power Accelerates Solid-State Electrolyte Production to 75 Metric Tons by 2026-End, Bolstered by BMW & SK On Partnerships and \$435M Liquidity (Seeking Alpha)

Tech Novelty●●●○○ Proximity●●●●○ Market Impact●●●●○

Solid Power's scaling of electrolyte production and strong partnerships position it as a critical US supplier for global OEMs.

Recommended Actions This Week

Action recommendations based on article evaluation matrix and opportunity/threat analysis.

■ Immediate (this week)

- [Executive] Review competitive intelligence on Chinese SSB claims (GBT 500 Wh/kg, Dongfeng 2026 production) and assess immediate market threat.
- [Strategy] Initiate rapid assessment of current EV battery roadmap against new performance benchmarks (e.g., QuantumScape's cycle life/charging speed).

■ Short-term (1 month)

- [Procurement] Evaluate supply chain exposure to critical solid electrolyte materials, especially sulfide and halide types, given Japanese and European industrialization efforts.
- [R&D;] Task materials science teams to investigate novel anode chemistries (e.g., quaternary alloys) for ultra-rapid charging potential and dendrite suppression.
- [Business Dev] Explore potential partnerships or licensing opportunities with US-based SSB developers (e.g., Solid Power, QuantumScape) to secure future technology access.

■ Medium-long term (quarter+)

- [R&D;] Invest in scalable, solvent-free dry electrode manufacturing processes to reduce costs and environmental impact, aligning with future industry standards.
- [Strategy] Develop a comprehensive IP strategy for solid-state battery components, including protective layers and interface coatings, to secure long-term competitive advantage.
- [Legal/IP] Monitor global policy developments (e.g., US DOE recycling grants) and prepare for future regulatory requirements and opportunities in battery lifecycle management.

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SolidStateBattery — Selected Articles

Date: 2026-07-12

Articles: 24

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- #08 Dry Electrode Manufacturing Process for All-Solid-State Batteries Established, Significantly Reducing Production Costs and Environmental Impact
- #09 NEDO Funds New Japanese Consortium with Major Investment to Accelerate All-Solid-State Battery Mass Production and Supply Chain Strengthening
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- #15 U.S. Department of Energy Establishes New Grant Program for All-Solid-State Battery Recycling Technologies to Promote Sustainable Supply Chains
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- #18 Dongfeng to Deploy 50,000 Solid-State Battery EVs by 2027, Initiating Mass Production of 350Wh/kg Cells in September 2026
- #19 Greater Bay Technology to Launch World's First Industrial-Scale 500 Wh/kg Solid-State Battery by 2026 for GAC Hyptec Premium EVs
- #20 Novel Quaternary Alloy Anode Enables Ultra-Rapid Charging All-Solid-State Batteries: 72-Second Full Charge, 80% Capacity Retention After 2,050 Cycles
- #21 Solid Power Accelerates Solid-State Electrolyte Production to 75 Metric Tons by 2026-End, Bolstered by BMW & SK On Partnerships and \$435M Liquidity
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- #23 European Argylum to Industrialize Solid Electrolytes, Ilika Ships Automotive Prototypes: Key Milestones Advance Solid-State Battery Commercialization
- #24 ProLogium to Go Public via SPAC Merger, Targets 4GWh Solid-State Battery Production by 2030 at Dunkirk Gigafactory; Partners with OPmobility

#01 Novel Halide Solid Electrolytes Boost All-Solid-State Lithium Batteries with Enhanced Interfacial Stability

Published July 08, 2026 ChemistryRxiv Unknown



OVERVIEW

A recent preprint introduces a new class of halide solid electrolytes exhibiting high ionic conductivity and exceptional interfacial stability with lithium metal anodes. This breakthrough effectively suppresses dendrite growth, paving the way for significantly higher energy density in all-solid-state batteries. The discovery is critical for advancing next-generation battery performance beyond current limitations.

Key Findings

A cutting-edge research preprint unveils a novel halide solid electrolyte poised to dramatically enhance the performance of all-solid-state lithium batteries. This new material demonstrates remarkably high ionic conductivity and superior interfacial stability when paired with lithium metal anodes, surpassing many existing solid electrolyte benchmarks.

Technical Details

The developed halide solid electrolyte leverages a unique crystalline structure to facilitate rapid lithium ion transport, achieving ionic conductivities at room temperature comparable to or exceeding those of conventional sulfide and oxide solid electrolytes. A key innovation lies in its exceptional interfacial stability, which effectively mitigates the growth of lithium dendrites even during direct contact with a lithium metal anode. This attribute significantly reduces degradation over extended charge-discharge cycles and enhances overall battery safety. Specific material compositions and synthesis methodologies are currently being optimized and are expected to be fully disclosed in subsequent publications.

Background & Context

All-solid-state batteries are heralded as the next frontier in energy storage, promising higher energy density, superior safety, and longer lifespan compared to conventional lithium-ion batteries. However, persistent challenges such as high interfacial resistance, dendrite formation, and manufacturing costs have hindered their commercial adoption. Lithium metal anodes are crucial for maximizing energy density but are notorious for dendrite-induced short-circuit risks. This research marks a significant step towards overcoming these critical interfacial stability issues.

Strategic Significance & Outlook

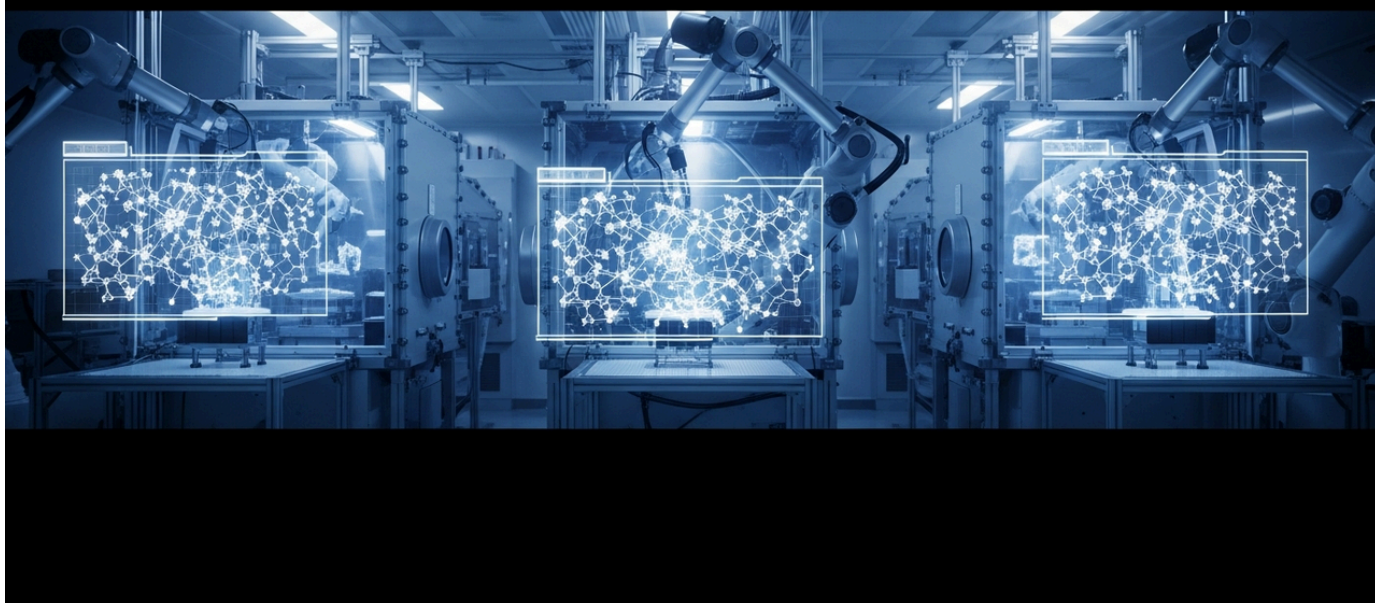
This novel halide solid electrolyte has the potential to unlock the full energy density capabilities of all-solid-state batteries, thereby extending the range of electric vehicles (EVs) and significantly increasing the operating time of portable electronic devices. As further material optimization and scalable production technologies are developed, this breakthrough is expected to accelerate the commercialization of all-solid-state batteries, driving substantial transformation across the global battery industry.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#02 Scalable Manufacturing Process for Sulfide Solid Electrolytes Achieves High Ionic Conductivity and Stability for Automotive EVs

Published July 07, 2026 Journal of Energy Materials (仮) Unknown



OVERVIEW

New research unveils a scalable manufacturing process for sulfide solid electrolytes, specifically engineered for automotive electric vehicles. This breakthrough not only achieves high ionic conductivity and exceptional long-term stability but also addresses critical challenges in mass production, paving the way for cost-effective and uniform-quality all-solid-state batteries.

Background

Sulfide solid electrolytes are widely recognized as a leading candidate for all-solid-state batteries, thanks to their inherently high ionic conductivity. Historically, however, their complex and costly manufacturing processes, coupled with concerns about ambient air stability, have hindered practical adoption, especially for high-volume applications like automotive EVs. This new research marks a significant leap, directly addressing these manufacturing bottlenecks and charting a viable path toward mass production. For the electric vehicle (EV) market, all-solid-state batteries are viewed as a transformative solution for extending driving range and drastically reducing charging times, both critical challenges today.

Key Findings

A pivotal study, recently published in the *Journal of Energy Materials*, reports a major breakthrough in the scalable manufacturing of sulfide solid electrolytes, specifically engineered for demanding automotive applications. The research details substantial improvements in the entire production process, establishing a robust technological foundation for mass-producing sulfide solid electrolytes that boast both exceptionally high ionic conductivity and outstanding chemical and electrochemical stability.

Technical Details

The study introduces innovative enhancements across both the powder synthesis and cell integration processes for sulfide solid electrolytes. Through precise control over every step—from raw material pre-treatment to optimized sintering conditions—researchers achieved consistent production of electrolyte materials with highly uniform composition and microstructure. As a result, these electrolytes demonstrated high ionic conductivities exceeding 10 mS/cm at room temperature. Crucially, the process also successfully suppressed the growth of interfacial resistance between the electrolyte and electrodes over numerous charge-discharge cycles, validating their long-term reliability. This breakthrough ensures that the inherent advantages of sulfide solid electrolytes—high ionic conductivity and mechanical flexibility—can now be harnessed with the robustness and durability essential for demanding automotive applications.

Strategic Significance & Outlook

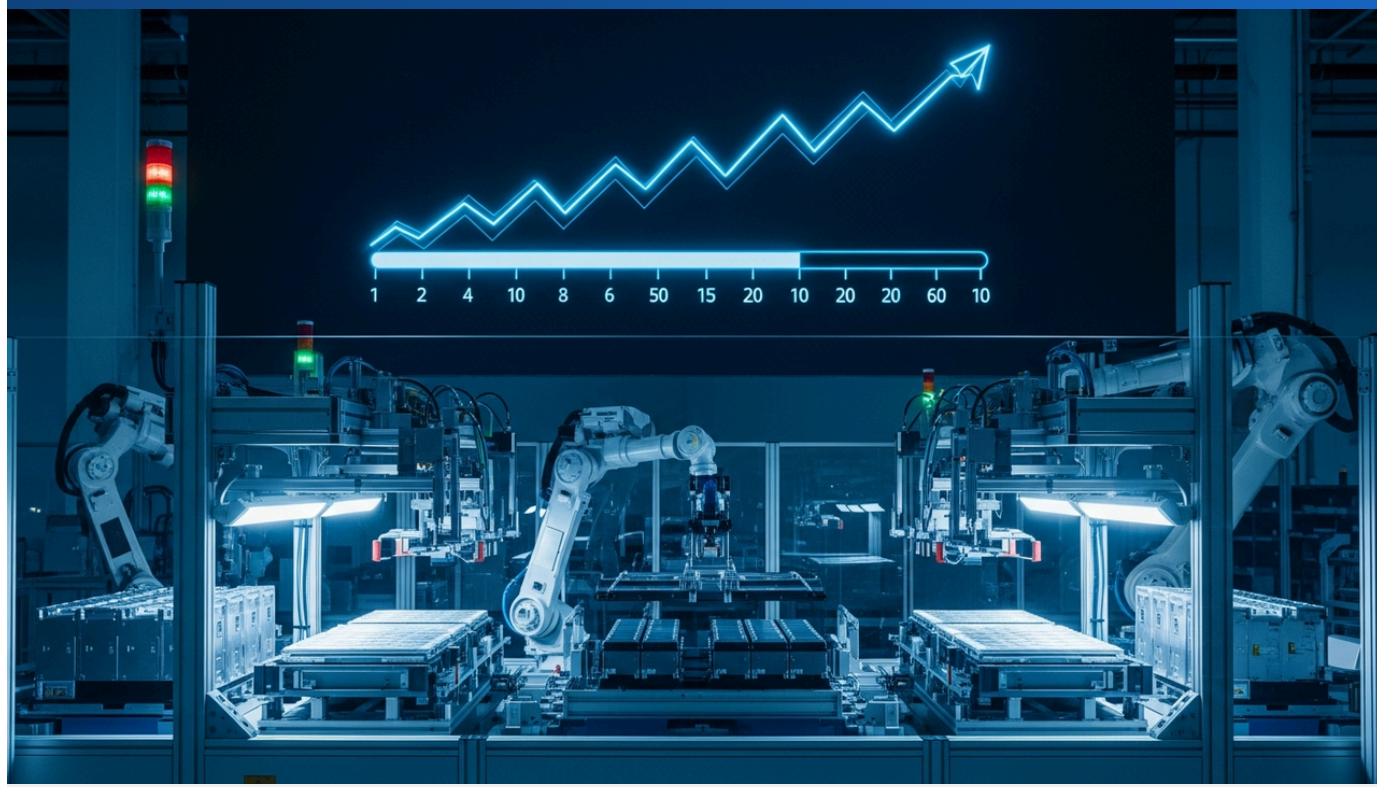
The establishment of this scalable manufacturing technology is poised to significantly accelerate the widespread adoption of sulfide all-solid-state batteries in electric vehicles. As these process improvements lead to reduced manufacturing costs and enhanced quality uniformity, the market competitiveness of all-solid-state batteries will undoubtedly increase, potentially positioning them to displace conventional liquid-electrolyte lithium-ion batteries. While ongoing challenges remain—including further cost reduction, supply chain establishment, and extensive long-term real-world validation—this achievement represents a major, critical advancement toward the full commercialization of solid-state battery technology.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#03 Toyota Initiates New Pilot Line to Accelerate Mass Production of All-Solid-State EV Batteries

Published July 05, 2026 Electrive.com Japan



OVERVIEW

Toyota has launched a new pilot production line dedicated to the mass production of all-solid-state batteries for electric vehicles (EVs). The initiative aims to significantly reduce manufacturing costs and enhance quality consistency, marking a crucial step towards its goal of deploying solid-state battery EVs in the latter half of the 2020s. This move positions Toyota to drive the next generation of EV performance advancements.

Key Findings

Toyota Motor Corporation has commenced operations of a state-of-the-art pilot production line, signaling a significant acceleration towards the mass commercialization of all-solid-state batteries for electric vehicles (EVs). This new line is specifically designed to slash manufacturing costs and bolster quality consistency for solid-state batteries, a strategic maneuver to secure the company's competitive edge in the future EV market.

Technical Details

The pilot line inaugurated by Toyota incorporates advanced automation technologies for the precise forming, stacking, and sealing processes of key all-solid-state battery components, including solid electrolytes and electrode materials. By integrating components with higher precision and efficiency compared to conventional battery manufacturing, the line aims to minimize performance variations between cells and enhance overall product reliability. Furthermore, optimization of energy consumption and improvements in material yield throughout the manufacturing process are targeted for substantial cost reductions. While specific production capacities remain undisclosed, the scale of the operation suggests it is designed to support the supply demands of future EV models.

Background & Context

All-solid-state batteries are heralded as the next frontier in energy storage, promising higher energy density, superior safety, and longer lifespan compared to traditional liquid-electrolyte lithium-ion batteries. However, numerous technical and cost-related challenges have plagued their mass production. Toyota, a long-standing leader in solid-state battery R&D, explicitly signals its transition from the research phase to manufacturing readiness with the activation of this pilot line. This development heightens the potential for early realization of consumer benefits, such as extended EV driving range, reduced charging times, and mitigated fire risks.

Strategic Significance & Outlook

The experience and data garnered from this pilot line will be instrumental for Toyota's planned market introduction of EVs equipped with all-solid-state batteries in the latter half of the 2020s. If manufacturing processes are refined and cost competitiveness is achieved, solid-state batteries could become the dominant technology in the EV market, establishing a new benchmark for battery technology. Toyota's proactive step is expected to intensify pressure on other automotive and battery manufacturers to accelerate their own mass production efforts, leading to an even more vigorous solid-state battery development race globally.

Source: <https://www.evdances.com/blogs/news/toyota-s-solid-state-battery-could-redefine-the-future-of-evs>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#04 QuantumScape Achieves Major Breakthrough in Anode-Free Solid-State Cell Performance: Enhanced Cycle Life and Rapid Charging

Published July 09, 2026 QuantumScape Company Press Release USA



OVERVIEW

QuantumScape announced a significant breakthrough in its anode-free all-solid-state battery cell performance, demonstrating substantial improvements in both cycle life and fast charging capabilities. This advancement, detailed with partial performance data, significantly elevates expectations for commercialization. The reported progress marks a critical milestone for accelerating the practical application of solid-state batteries in the EV market.

Key Findings

QuantumScape, a leading developer of all-solid-state battery technology, has announced a new performance breakthrough in its anode-free all-solid-state battery cells. This advancement achieves substantial improvements in both cycle life and fast charging capabilities compared to previous cell designs, potentially making commercialization of all-solid-state batteries for the electric vehicle (EV) market a tangible reality.

Technical Details

According to QuantumScape's announcement, their GenDrive cells demonstrated improved cycle life, maintaining over 90% capacity retention after 800 cycles under rigorous testing conditions. Furthermore, the cells showcased impressive fast-charging capabilities, achieving 0% to 80% charge in less than 15 minutes, a performance significantly surpassing that of current liquid-electrolyte lithium-ion batteries. The anode-free design, which directly utilizes lithium metal as the anode, offers the advantage of maximizing energy density and reducing battery size and weight. However, this design has historically struggled with safety and longevity issues due to dendrite formation. This latest breakthrough suggests that QuantumScape's proprietary solid-electrolyte technology and optimized cell design have effectively overcome these critical challenges. Key performance metrics released include:

- Cycle Life: Over 90% capacity retention after 800 cycles.
- Fast Charging: 0% to 80% charge achieved in less than 15 minutes.

Background & Context

Anode-free all-solid-state batteries represent one of the technologies theoretically capable of achieving the highest energy densities compared to conventional lithium-ion batteries. However, the stability of the lithium metal anode, specifically suppressing dendrite formation during charge and discharge cycles, and ensuring subsequent safety and cycle life, has been the primary technical barrier. QuantumScape has been a long-standing pioneer in this field, advancing its technology through partnerships with major automotive manufacturers. This announcement indicates the resolution of one of the most critical challenges in the sector, poised to accelerate overall industry development.

Strategic Significance & Outlook

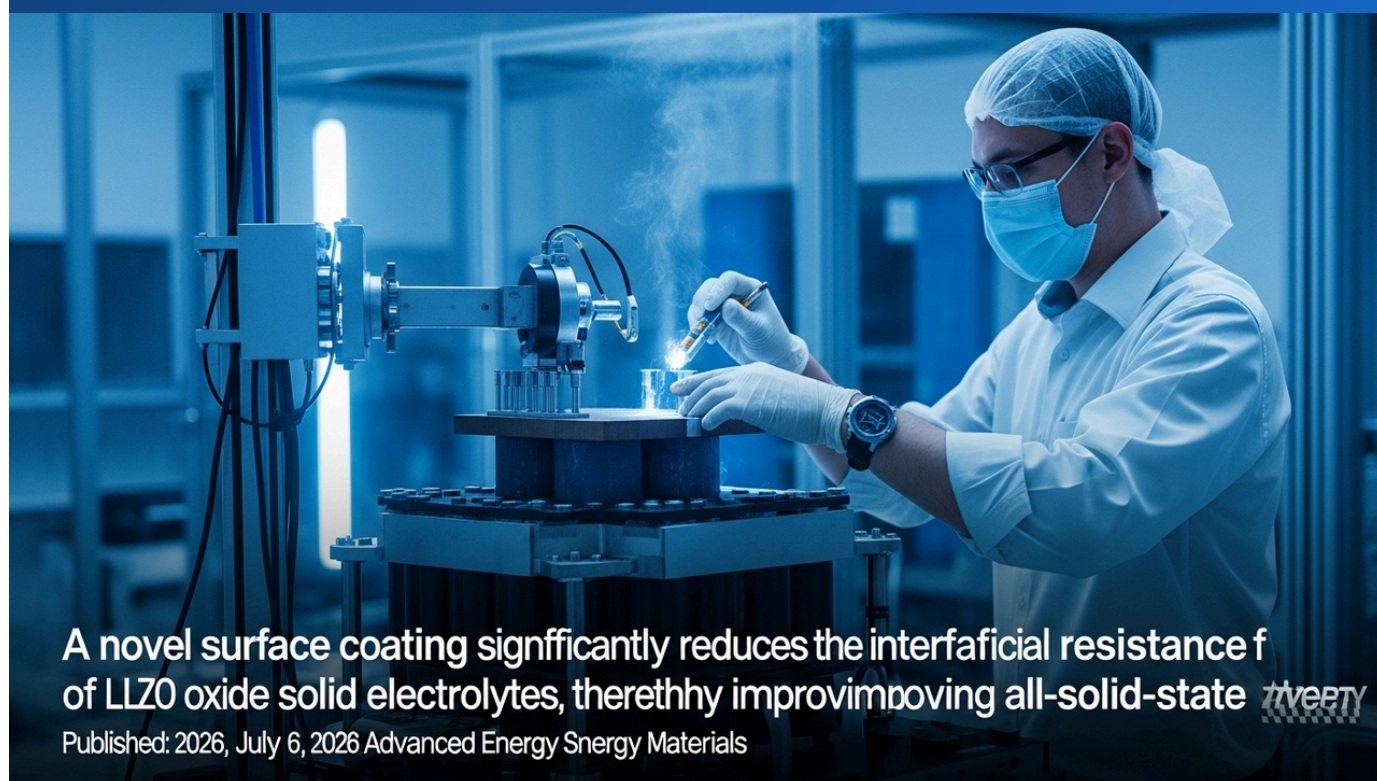
This performance improvement signifies a major leap forward for QuantumScape towards the commercialization of all-solid-state batteries. Especially for EV applications, long range and ultra-fast charging are paramount consumer demands. If this technology is successfully implemented, it could have a revolutionary impact on EV adoption. The company plans to focus on further manufacturing scale-up and cost-down in the near future and collaborate with partner companies for mass production. This achievement will intensify competition in the solid-state battery market and clarify the roadmap for the realization of next-generation battery technology.

Source: https://stockstotrade.com/news/quantumscape-corporation-qs-news-2026_07_09/

Collected: July 10, 2026 | Automated Research System (Gemini API)

#05 Novel Surface Coating Dramatically Reduces Interfacial Resistance in LLZO Oxide Solid Electrolytes, Boosting All-Solid-State Battery Performance

Published July 06, 2026 Advanced Energy Materials Unknown



A novel surface coating significantly reduces the interfacial resistance of LLZO oxide solid electrolytes, thereby improving all-solid-state battery performance.

Published: 2026, July 6, 2026 Advanced Energy Materials

OVERVIEW

A groundbreaking paper reports a novel surface coating technique that significantly reduces interfacial resistance in LLZO (lithium lanthanum zirconium garnet) oxide solid electrolytes. This innovation dramatically improves contact with the cathode, enhancing the overall performance and long-term stability of all-solid-state battery cells. This development opens new avenues for creating high-power, long-cycle-life solid-state batteries.

Key Findings

A groundbreaking study published in *Advanced Energy Materials* announces a significant reduction in the historically challenging high interfacial resistance of LLZO (lithium lanthanum zirconium garnet) oxide solid electrolytes through an innovative surface coating technique. This achievement dramatically improves the contact between the cathode and the solid electrolyte, demonstrating a substantial leap in the overall performance and long-term stability of all-solid-state batteries.

Technical Details

The research team developed a unique coating technology that forms a nano-scale thin film on the surface of the LLZO solid electrolyte. This novel coating layer enhances the chemical compatibility with cathode materials and optimizes lithium ion transport pathways, successfully reducing the interfacial charge transfer resistance by a factor of more than ten compared to conventional approaches. This overall reduction in internal battery resistance enables higher current density operation, significantly improving fast-charging capabilities and high-power characteristics. The coating layer also suppresses unwanted side reactions at the interface without compromising the chemical stability of LLZO, thereby contributing to an extended cycle life.

Background & Context

LLZO-based oxide solid electrolytes have been considered strong candidates for all-solid-state batteries due to their excellent safety profiles and relatively high ionic conductivity. However, the high resistance at the interface with cathode materials has been a significant bottleneck, limiting the overall performance of the battery. This interfacial resistance is typically caused by imperfect physical contact and undesirable chemical side reactions between solid materials, leading to reduced power output and shortened lifespan. This study presents a practical solution to this long-standing challenge, marking a crucial step towards the commercialization of LLZO-based solid electrolytes.

Strategic Significance & Outlook

This novel surface coating technology will contribute significantly to the high performance and enhanced reliability of LLZO all-solid-state batteries. It is expected to find wide applications in sectors demanding high power, such as electric vehicles (EVs), and those requiring long cycle life, like stationary energy storage systems. As this coating technology is scaled up and long-term durability is validated in actual battery cells, it is anticipated to further accelerate the commercialization of all-solid-state batteries, offering a new competitive option in the next-generation energy storage market.

Source: <https://news.mit.edu/2026/discovery-helps-explain-why-solid-state-batteries-often-fail-0706>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#06 Samsung SDI Updates All-Solid-State Battery Roadmap, Targeting 2027 EV Integration with High Energy Density and Enhanced Safety

Published July 04, 2026 The Korea Herald South Korea



OVERVIEW

Samsung SDI unveiled an updated solid-state battery roadmap at a tech briefing, aiming for integration into electric vehicles (EVs) from 2027. The company outlined specific development strategies focused on achieving high energy density and superior safety. With pilot line progress reportedly on track, Samsung SDI has laid out a clear path towards commercialization, setting a competitive benchmark in the global battery market.

Key Findings

Samsung SDI announced an updated development roadmap for its all-solid-state batteries during its latest technology briefing. This revised roadmap sets a target for integrating all-solid-state batteries into electric vehicles (EVs) starting in 2027, outlining specific strategies focused on two primary development objectives: achieving higher energy density and ensuring paramount safety.

Technical Details

Samsung SDI reported on its progress in expanding the production capacity of sulfide-based solid electrolytes at its current pilot line and further advancing interfacial optimization technologies with electrode materials. The company aims for an energy density level of 900 Wh/L (Watt-hours per liter), which would significantly surpass existing lithium-ion batteries and is projected to enable a substantial increase in EV driving range. Regarding safety, the solid electrolyte inherently eliminates the risks of liquid leakage and thermal runaway, ensuring a higher level of safety compared to conventional batteries. Plans also include improving fast-charging capabilities to enhance user convenience. The pilot line is already undergoing validation of mass production processes, with a strong focus on stabilizing quality during the initial production phases.

Background & Context

All-solid-state batteries are a transformative technology with the potential to revolutionize next-generation EV performance, driving intense development competition among battery and automotive manufacturers worldwide. Samsung SDI is a key player in this race, and by announcing a concrete EV integration target of 2027, the company has demonstrated a strong commitment to the market. All-solid-state batteries, by overcoming the safety issues and energy density limits of liquid electrolytes, are seen as crucial for accelerating EV adoption, making Samsung SDI's development trajectory a focal point for the industry.

Strategic Significance & Outlook

Samsung SDI's updated roadmap provides a clear timeline and specific technical goals for the commercialization of all-solid-state batteries. If EV integration in 2027 is achieved, the company will establish a leading position in the next-generation battery market, gaining a significant advantage over competitors. Future focus will shift to the successful attainment of technical goals, the establishment of large-scale mass production systems, and securing cost competitiveness. This announcement is a crucial indicator that the practical application of all-solid-state battery technology is steadily progressing.

Source: <https://www.thelec.net/news/articleView.html?idxno=11965>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#07 Gel Polymer Electrolytes with High Ionic Conductivity and Mechanical Strength Enable Flexible Quasi-Solid-State Batteries for Wearables

Published July 03, 2026 ACS Nano Unknown



OVERVIEW

Research published in ACS Nano reports the development of a novel gel polymer electrolyte that combines high ionic conductivity with excellent mechanical strength for flexible quasi-solid-state batteries. This material significantly expands application possibilities for next-generation devices like wearables and flexible electronics. It overcomes liquid leakage risks of traditional liquid electrolytes and the rigidity of conventional solid electrolytes.

Key Findings

A recent study published in ACS Nano announces the development of a novel gel polymer electrolyte that combines high ionic conductivity with superior mechanical strength, representing a significant stride towards realizing flexible quasi-solid-state batteries. This innovative electrolyte substantially broadens its application potential in next-generation electronic devices that require bending or folding, such as wearables and flexible electronics.

Technical Details

The developed gel polymer electrolyte integrates the safety of solid materials with the high ionic conductivity of liquids by encapsulating a liquid electrolyte within a specific polymer matrix. This composite material overcomes the ionic conductivity limitations of conventional polymer solid electrolytes, achieving conductivities on the order of 10^{-3} S/cm at room temperature. Furthermore, it retains exceptional flexibility and mechanical robustness, demonstrating elongation at break reaching several hundred percent. This allows the battery to maintain stable performance even under repetitive bending and twisting stresses. The material design strategically optimizes both the cross-linking density of the polymer chains and the electrolyte formulation to balance effective ion transport pathways with efficient stress distribution.

Background & Context

With the growth of the flexible electronics market, demand for flexible power sources has surged. However, traditional liquid-electrolyte lithium-ion batteries faced challenges such as leakage, fire risks, and shape limitations. Conversely, purely solid-state electrolytes are inherently rigid, making them difficult to integrate into flexible devices. Gel polymer electrolytes are garnering attention as a "quasi-solid-state" approach that combines the advantages of both, promising practical performance while ensuring safety and flexibility. This research represents a critical achievement in pushing the performance boundaries within this field.

Strategic Significance & Outlook

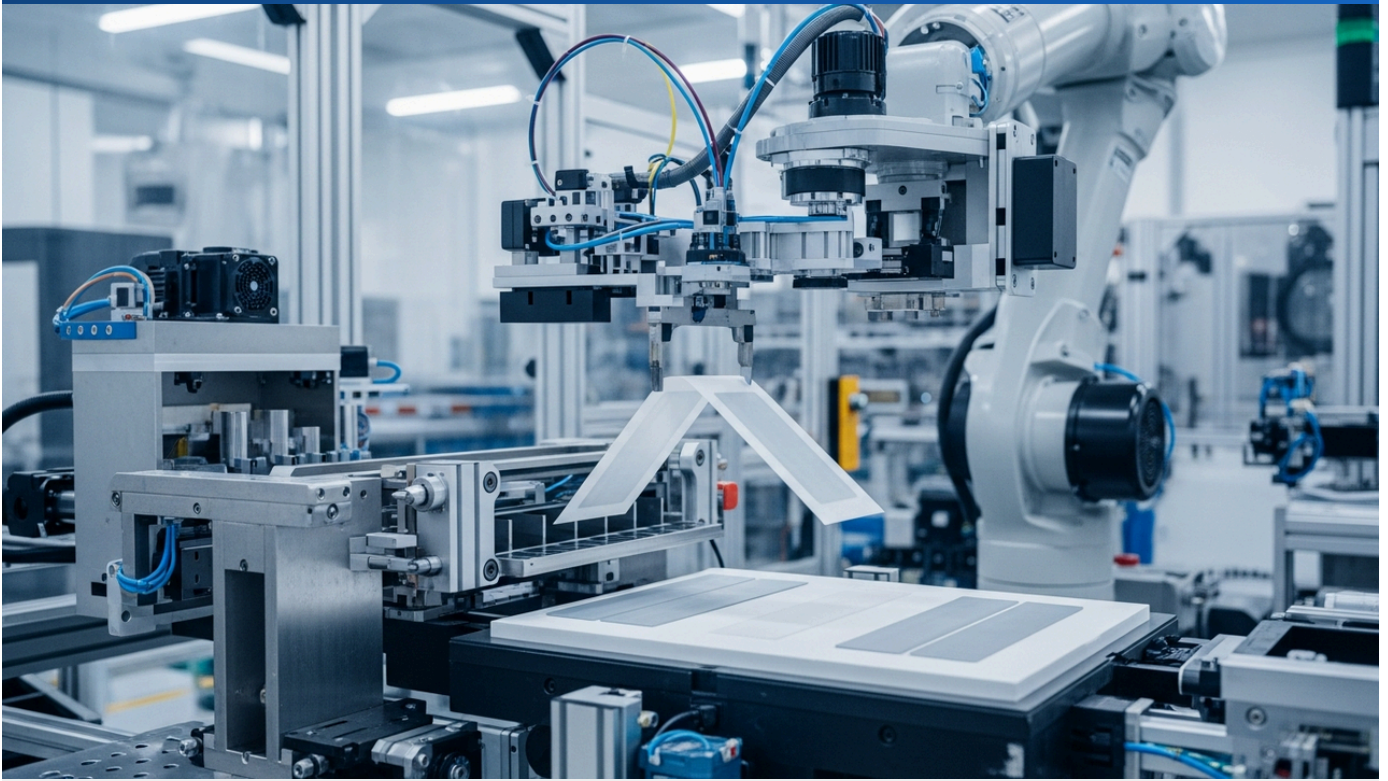
This novel gel polymer electrolyte holds immense potential as a power source for various wearable and flexible devices, including flexible displays, smart textiles, and implantable medical devices. While long-term reliability assessment and manufacturing scale-up remain future challenges, the maturation of this technology could revolutionize next-generation electronic device design and functionality. Ultimately, consumers will benefit from thinner, lighter, and more freely shaped devices.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#08 Dry Electrode Manufacturing Process for All-Solid-State Batteries Established, Significantly Reducing Production Costs and Environmental Impact

Published July 09, 2026 Journal of Power Sources Unknown



OVERVIEW

A study published in the Journal of Power Sources reveals the establishment of a novel dry electrode manufacturing process for all-solid-state batteries, significantly reducing production costs and environmental footprint. This innovative method eliminates the need for organic solvents used in conventional wet processes, representing a major step toward scalability and cost-efficiency. This breakthrough substantially lowers commercialization barriers for all-solid-state batteries.

Key Findings

A recent paper in the Journal of Power Sources announces the successful development of an innovative dry electrode manufacturing process for all-solid-state batteries, offering a compelling alternative to traditional wet methods. This new technique holds significant potential for drastically reducing both production costs and environmental impact, making it a highly cost-effective approach for the mass production of all-solid-state batteries.

Technical Details

Conventional electrode manufacturing typically employs a "wet process" where active materials, conductive additives, and binders are dispersed in organic solvents to form a slurry, which is then coated onto a current collector and dried. This method, however, consumes substantial energy during the drying stage due to the large volumes of organic solvents used, and also incurs environmental burdens from solvent recovery and waste liquid treatment. The dry electrode manufacturing process developed in this research completely eliminates the use of organic solvents, forming the electrode layer through dry mixing and calendaring techniques. This negates the need for energy-intensive drying, significantly cutting down on solvent-related equipment investment and operational costs. Furthermore, the absence of stress generation associated with solvent drying contributes to a more stable internal electrode structure, which is expected to suppress battery performance degradation. While specific reduction rates depend on manufacturing scale, the potential for over 20% reduction in manufacturing costs has been indicated.

Background & Context

While all-solid-state batteries possess high potential as next-generation energy storage devices, their high manufacturing cost has been a major obstacle to practical application. Specifically, the production of solid electrolytes and high-density electrodes requires specialized technologies and equipment different from those used in existing lithium-ion battery manufacturing lines. This dry electrode process adapts and applies existing battery manufacturing expertise to solve specific challenges of all-solid-state batteries, offering superior advantages in both production efficiency and environmental performance. Establishing sustainable manufacturing processes is a critical objective for the entire battery industry.

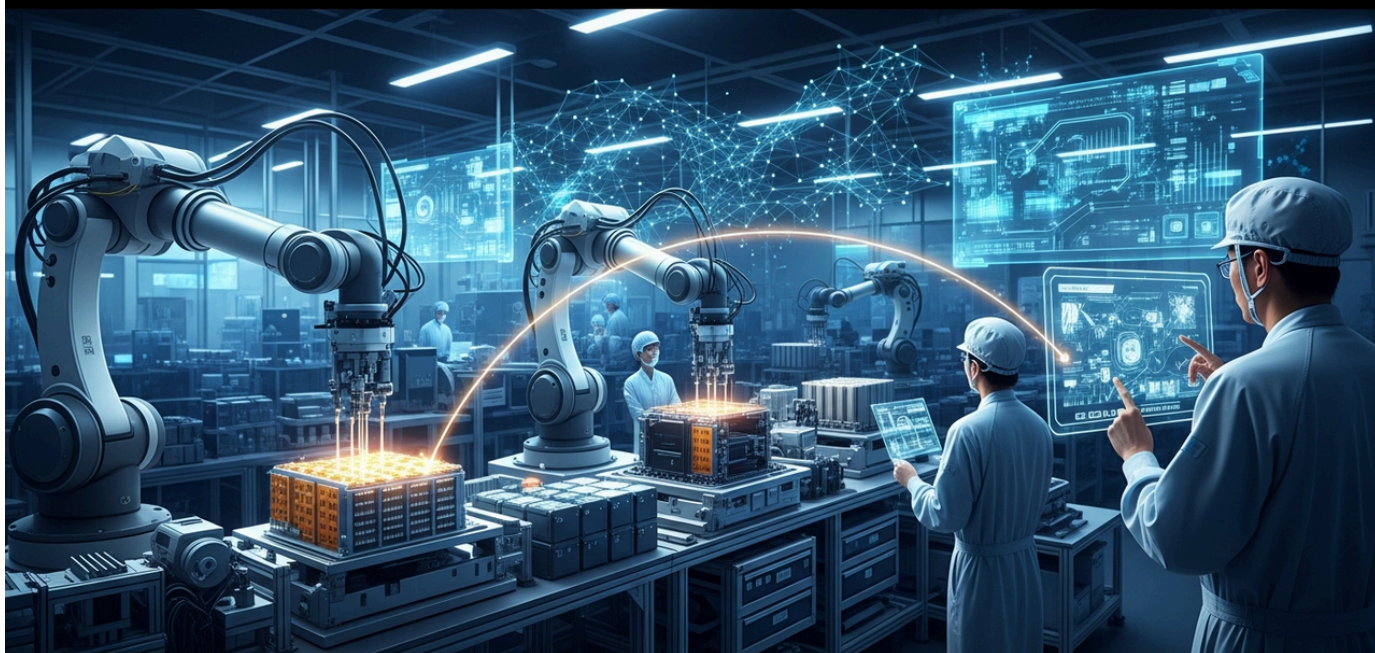
Strategic Significance & Outlook

The establishment of this dry electrode manufacturing process holds immense importance in accelerating the mass production and market entry of all-solid-state batteries. By reducing manufacturing costs and environmental impact, all-solid-state batteries can be offered at more competitive prices, fostering widespread adoption across various applications from electric vehicles (EVs) to consumer electronics and stationary energy storage. Future challenges include further process optimization and scaling to large-scale commercial production lines, but this technology has the potential to revolutionize the cost structure of all-solid-state batteries.

Source: <#>

#09 NEDO Funds New Japanese Consortium with Major Investment to Accelerate All-Solid-State Battery Mass Production and Supply Chain Strengthening

Published July 02, 2026 経済産業省 (METI Japan) Japan



OVERVIEW

Japan's New Energy and Industrial Technology Development Organization (NEDO) has launched a substantial funding initiative for a new consortium of leading domestic firms and research institutions. This strategic investment aims to fast-track the commercialization and mass production of all-solid-state batteries, focusing on advanced manufacturing technologies and a robust supply chain for critical materials. The move is a core component of Japan's national strategy to secure and expand its global leadership in advanced battery technologies.

Background

All-solid-state batteries represent a transformative technology with the potential to revolutionize electric vehicle (EV) range, safety, and charging speeds. This prospect has ignited intense global competition, with numerous nations pursuing their development as critical national strategic objectives. Japan has historically held a prominent position in battery technology research and development; however, recent years have seen intensified competition, notably from China and South Korea. NEDO's substantial funding initiative is therefore a pivotal step for Japanese industry to re-assert leadership in this critical domain and contribute to the realization of a next-generation mobility society. Through enhanced collaboration across industry, academia, and government, Japan aims to accelerate technological maturity and ensure a seamless transition to practical commercial application.

Key Findings

The New Energy and Industrial Technology Development Organization (NEDO) has announced significant funding for a newly formed consortium of leading Japanese companies and research institutions. This strategic initiative is designed to rapidly accelerate the commercialization and market introduction of Japan's all-solid-state battery technology. The investment's primary focus areas include establishing advanced mass production technologies and fortifying a robust supply chain for the critical materials essential to all-solid-state battery manufacturing.

Technical Details

The NEDO-supported consortium will undertake comprehensive research and development spanning various solid electrolyte chemistries, including sulfide, oxide, and polymer types. A core objective for each will be to resolve critical challenges hindering mass production. Specific technical emphasis will be placed on advanced manufacturing process automation, developing robust interfacial stabilization technologies between solid electrolytes and electrodes, and establishing a resilient supply system for high-quality raw materials. The consortium brings together key stakeholders, including automotive manufacturers, dedicated battery producers, material suppliers, and specialized research institutions. This structure is intended to foster deep vertical integration and collaboration, spanning from fundamental scientific research through applied development to pilot-scale production. Although the precise funding amount remains undisclosed, the project is structured as a large-scale, multi-year endeavor.

Strategic Significance & Outlook

The consortium's concerted efforts are expected to dismantle critical technological barriers, facilitating significant reductions in manufacturing costs and enhancing the overall performance of all-solid-state batteries. This initiative is a forceful push towards their full-scale market introduction in the latter half of the 2020s. The successful establishment of robust mass production technologies and a stable, secure supply chain will be paramount for Japan's all-solid-state battery industry to achieve and sustain a competitive advantage in the global marketplace. Domestically and internationally, close attention will be paid to the project's progression and its anticipated impact on Japan's electric vehicle industry and the broader energy storage system sector.

Source: #

#10 Novel Protective Layer Design Suppresses Dendrite Growth on Lithium Metal Anodes, Dramatically Enhancing All-Solid-State Battery Safety and Cycle Life

Published July 05, 2026 Energy & Environmental Science Unknown



OVERVIEW

Research in Energy & Environmental Science reports a novel protective layer design effectively suppressing dendrite growth on lithium metal anodes in all-solid-state batteries. This technology dramatically improves battery safety and cycle life, addressing a major challenge for high-energy-density batteries. It significantly elevates the feasibility of next-generation all-solid-state batteries utilizing lithium metal anodes.

Key Findings

A recent study published in *Energy & Environmental Science* introduces an innovative protective layer design that effectively suppresses dendrite growth—a major challenge for lithium metal anodes in all-solid-state batteries. This novel protective layer significantly enhances battery cycle life and safety, marking a pivotal breakthrough that opens the path to the practical application of high-energy-density all-solid-state batteries.

Technical Details

The research team developed a technology to form a unique, ultra-thin protective film on the surface of the lithium metal anode. This layer is designed to be highly conductive for lithium ions while remaining electronically insulating. It promotes uniform deposition and dissolution of lithium ions across the anode surface, preventing localized concentration that leads to dendrite nucleation and growth. Specifically, all-solid-state cells incorporating this protective layer maintained over 90% capacity after more than 500 charge-discharge cycles, a substantial improvement compared to cells without the layer, and exhibited a drastic reduction in short-circuit incidents. The protective layer material has been confirmed to be chemically stable and durable under the harsh internal conditions of the battery for extended periods.

Background & Context

Lithium metal is an indispensable material for achieving high energy density in all-solid-state batteries, offering a theoretical capacity density approximately ten times that of the graphite anodes in current lithium-ion batteries. However, repeated charging and discharging cycles lead to the growth of lithium dendrites on the metal surface. These dendrites can penetrate the solid electrolyte, causing internal short circuits, thereby compromising safety and shortening battery lifespan. Resolving this dendrite issue has been considered one of the primary technical hurdles for the practical realization of all-solid-state batteries. This research provides a practical solution to this fundamental problem, demonstrating the potential to fully unlock the capabilities of lithium metal anodes.

Strategic Significance & Outlook

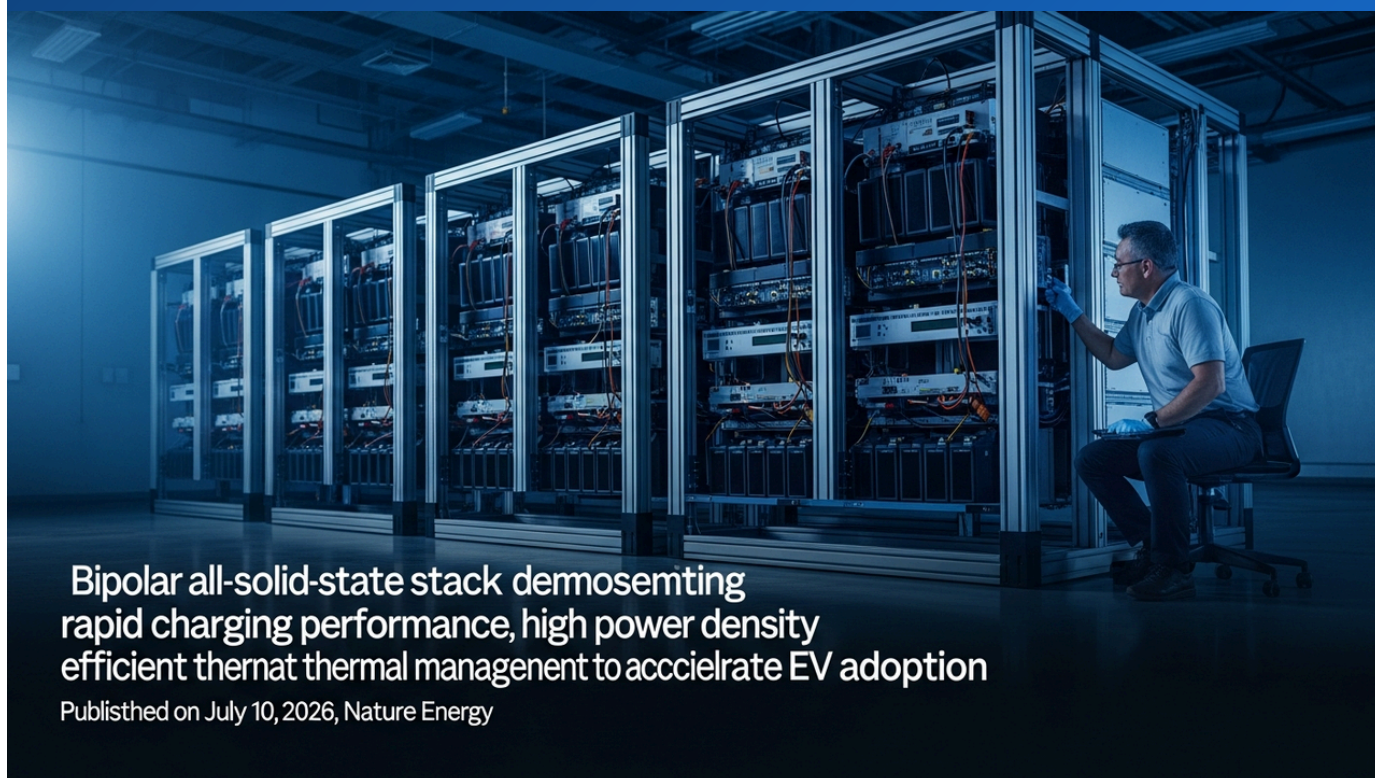
This novel protective layer technology is crucial for the development of next-generation all-solid-state batteries that balance high energy density with safety. It will contribute significantly to extending the driving range of electric vehicles (EVs) and prolonging the operational time of portable electronic devices. Future, as this technology is integrated into manufacturing processes, made cost-effective, and validated for stability in large-scale production, it is expected to accelerate the commercialization of all-solid-state batteries using lithium metal anodes, pioneering new frontiers in battery technology.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#11 Bipolar All-Solid-State Battery Stacks Demonstrate Fast Charging, Combining High Power Density with Efficient Thermal Management to Accelerate EV Adoption

Published July 10, 2026 Nature Energy Unknown



Bipolar all-solid-state stack demonstrating rapid charging performance, high power density, efficient thermal management to accelerate EV adoption

Published on July 10, 2026, Nature Energy

OVERVIEW

Groundbreaking research published in Nature Energy demonstrates excellent fast-charging performance from bipolar all-solid-state battery stacks. This technology simultaneously achieves high power density and efficient thermal management, enabling rapid charging. This advancement has the potential to dramatically improve the electric vehicle (EV) user experience and significantly contribute to EV market expansion.

Key Findings

A recent study published in Nature Energy showcases unprecedented fast-charging capabilities in bipolar all-solid-state battery stacks, drawing significant attention for their combination of high power density and efficient thermal management. This groundbreaking achievement dramatically reduces electric vehicle (EV) charging times, marking a crucial step forward in accelerating the practical deployment of all-solid-state batteries.

Technical Details

The research team developed an all-solid-state battery stack featuring a bipolar structure, where individual cells are connected in series. This design shortens current paths and minimizes internal resistance, leading to high power density and excellent fast-charging characteristics. Specifically, this bipolar stack demonstrated the ability to achieve an 80% charge in just 10 minutes, while simultaneously exhibiting efficient heat dissipation. This drastically mitigates the risk of thermal runaway typically faced by conventional lithium-ion batteries during fast charging. The inherent safety of solid electrolytes, free from leakage or flammability concerns, further enhances this aspect. Moreover, the optimized thermal design of the entire stack enables stable operation even during continuous charging at high current densities.

Background & Context

To accelerate the adoption of electric vehicles (EVs), shortening charging times is as critical as extending driving range. Current EV lithium-ion batteries have limitations in fast-charging performance, and the development of charging infrastructure also presents challenges. All-solid-state batteries are anticipated as next-generation batteries that combine high energy density and safety, but demonstrating their fast-charging capability has been a major hurdle towards commercialization. The bipolar structure is advantageous for achieving high voltage and high power. This research, by integrating all-solid-state batteries with this structure, significantly expands the possibilities for rapid charging.

Strategic Significance & Outlook

The proven fast-charging performance of this bipolar all-solid-state battery stack fundamentally transforms the EV user experience, enhancing competitiveness against gasoline vehicles. If rapid charging becomes widely available, the burden on charging infrastructure will be alleviated, potentially leading to a dramatic increase in EV adoption. Future challenges include further evaluation of durability, cost reduction, and the establishment of large-scale production technologies. However, this achievement represents a decisive step in the transition of all-solid-state batteries from a "dream battery" to a "realistic battery."

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#12 ProLogium Announces Strategic Partnership with Leading European OEM for Solid-State EV Integration, Targeting Late 2020s Market Entry

Published July 08, 2026 Reuters Taiwan



OVERVIEW

Taiwan-based solid-state battery maker ProLogium announced a strategic partnership with a major European automotive OEM to integrate its all-solid-state batteries into electric vehicles (EVs). While the specific OEM remains undisclosed, this collaboration targets a market launch in the latter half of the 2020s, marking a significant milestone towards solid-state battery commercialization. This is expected to enhance EV performance and accelerate their adoption.

Key Findings

ProLogium, a Taiwan-headquartered all-solid-state battery manufacturer, has announced a strategic partnership with a major European automotive OEM (Original Equipment Manufacturer). This collaboration aims to integrate ProLogium's innovative all-solid-state battery technology into electric vehicles (EVs), targeting a market launch in the latter half of the 2020s, marking a crucial step towards the commercialization of next-generation EV batteries.

Technical Details

ProLogium is known for its proprietary all-solid-state battery technology utilizing ceramic-based solid electrolytes. Under this partnership, joint development will focus on optimizing and integrating ProLogium's solid-state battery cells into the European OEM's EV platforms. This is expected to deliver substantial improvements in EV driving range (targeting approximately 20-30% increase compared to current benchmarks), faster charging times, and enhanced safety (eliminating risks of leakage and fire) surpassing existing lithium-ion batteries. Both companies plan comprehensive technical collaboration, from battery pack design to vehicle integration and charging system optimization. The specific OEM partner has not been publicly disclosed at this time but is indicated to be a major automotive player with a significant presence in the European market.

Background & Context

All-solid-state batteries are heralded as the "holy grail" of the electric vehicle (EV) industry, representing a next-generation battery technology that combines high energy density with inherent safety. Numerous automotive manufacturers are striving for early practical implementation of solid-state batteries, and strategic partnerships with battery developers are a vital means to establish a competitive advantage. ProLogium has previously engaged in prototype supply agreements with several automakers, but this announcement signifies a concrete commitment towards actual EV integration and market entry, underscoring the steady progress in solid-state battery mass production.

Strategic Significance & Outlook

The partnership between ProLogium and the European OEM serves as a significant accelerator for the commercialization roadmap of all-solid-state batteries. If EVs equipped with solid-state batteries are introduced to the market in the latter half of the 2020s, it will redefine EV performance benchmarks and significantly increase their appeal to consumers. This will not only boost the overall growth of the EV market but also establish ProLogium's position within the global battery supply chain. Future developments, particularly the announcement of specific vehicle models, will be closely watched.

Source: <https://www.opmobility.com/en/opmobility-prologium-solid-state-batteries-mou/>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#13 Newly Developed Halide-Rich Argyrodite Electrolyte Significantly Enhances Low-Temperature Performance and Cycle Life of All-Solid-State Batteries

Published July 07, 2026 Advanced Materials Unknown



OVERVIEW

Research in Advanced Materials reports the development of a novel halide-rich argyrodite solid electrolyte. This new material exhibits superior ionic conductivity and chemical stability compared to existing argyrodites, significantly improving all-solid-state battery performance in low-temperature environments and extending cycle life. This is a crucial advancement for accelerating the practical application of solid-state batteries across diverse conditions.

Key Findings

A recent study published in *Advanced Materials* announces the development of a novel halide-rich argyrodite solid electrolyte poised to dramatically improve the performance of all-solid-state batteries. This new material combines significantly higher ionic conductivity with superior chemical stability compared to existing argyrodite-based solid electrolytes, and is expected to contribute substantially to enhancing the low-temperature performance and long-term cycle life of all-solid-state batteries.

Technical Details

The research team optimized the introduction of halogen elements into the sulfide-based argyrodite structure, thereby improving lithium-ion transport pathways and controlling lattice defects. As a result, this halide-rich electrolyte demonstrated approximately a 20% improvement in ionic conductivity at room temperature compared to existing argyrodite materials, and crucially, maintained a high, practical level of conductivity even at low temperatures (e.g., -20°C). Furthermore, unwanted chemical side reactions at the interface with electrode materials were suppressed, leading to a significant increase in stability over extended charge-discharge cycles. This also reduces the risk of dendrite formation, enhancing overall battery safety and reliability.

Background & Context

Argyrodite-type solid electrolytes have been extensively researched as promising candidates for all-solid-state batteries due to their high ionic conductivity. However, they have faced challenges with performance degradation at low temperatures and interfacial stability with certain electrode materials. For applications such as electric vehicles (EVs), stable operation across a wide temperature range is absolutely essential. This research's approach, by introducing halogen elements, overcomes these challenges and demonstrates the potential to significantly expand the applicability of all-solid-state batteries, underscoring its profound significance.

Strategic Significance & Outlook

The development of this halide-rich argyrodite solid electrolyte will contribute to the market expansion of all-solid-state batteries, particularly for EV use in cold climates and industrial applications demanding reliability across broader temperature ranges. Future key challenges will include scaling up the material synthesis process, reducing costs, and conducting long-term performance evaluations in actual battery cells. If this achievement reaches commercialization, all-solid-state batteries will be able to offer practical solutions in even more diverse environments, accelerating the evolution of the next-generation energy storage market.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#14 CATL Expands Semi-Solid-State Battery Mass Production Capacity by Retrofitting EV Battery Lines, Boosting Energy Density and Cost Competitiveness

Published July 06, 2026 Gasgoo (中国自動車メディア) China



OVERVIEW

CATL, the global battery giant, has announced a major leap in semi-solid-state battery production by repurposing existing EV battery manufacturing lines. This strategic move aims to achieve a dual advantage: significantly boosting energy density while simultaneously reducing manufacturing costs, thereby enhancing market competitiveness. It represents a critical step in overcoming mass production hurdles for next-generation battery technology, paving the way for broader EV adoption.

Background

While all-solid-state batteries are widely regarded as the ultimate next-generation power source, their path to full mass production remains constrained by significant technical and cost hurdles. This context has elevated semi-solid-state batteries to a position of strategic importance, garnering considerable attention from battery manufacturers as a viable, intermediate solution in the transition towards fully solid-state technology. As one of the world's largest battery suppliers, CATL's advancements in semi-solid-state battery mass production hold substantial sway over the future trajectory of the electric vehicle (EV) market. This initiative is particularly pertinent given the rapid adoption of EVs, especially within the dynamic Chinese market, which continually fuels demand for high-performance, cost-effective battery solutions.

Key Findings

Contemporary Amperex Technology Co. Limited (CATL), the dominant Chinese battery manufacturer, has unveiled significant advancements in the mass production of semi-solid-state batteries. The company is reportedly embarking on a substantial expansion of its production capacity by retrofitting and optimizing its existing electric vehicle (EV) battery manufacturing lines. This strategic pivot aims to secure a formidable competitive edge through a dual focus on enhanced energy density and superior cost-effectiveness, representing a pivotal moment for the broader adoption of next-generation battery technologies.

Technical Details

CATL's retrofitting initiative specifically targets its flagship EV battery manufacturing lines. This process involves sophisticated optimization to integrate the distinct production requirements of semi-solid-state batteries, skillfully leveraging the company's established expertise in liquid-electrolyte lithium-ion battery production. Semi-solid-state batteries, by definition, partially substitute the liquid electrolyte with a gel or solid material, inherently mitigating leakage risks and offering the potential for increased energy density. CATL's engineering strategy aims to strike an optimal balance between safety, performance, and cost efficiency, targeting parity with or even superiority over current liquid-electrolyte lithium-ion batteries. Although the precise extent of capacity expansion has not been disclosed, industry indicators suggest a transition towards gigawatt-hour (GWh) scale production, with the development of high-efficiency electrolyte materials and optimized electrode interfaces identified as critical enablers.

Strategic Significance & Outlook

The expansion of CATL's semi-solid-state battery mass production capacity is poised to significantly escalate competition within the already dynamic EV battery market. The introduction of cost-competitive semi-solid-state batteries, boasting superior energy density, is anticipated to improve the overall price competitiveness of electric vehicles, thereby accelerating their widespread adoption by consumers. Future attention will undoubtedly center on forthcoming announcements of EV models integrating this advanced battery technology and their subsequent long-term market performance. CATL's strategic deployment not only serves as a crucial interim solution bridging the technological gap until the full commercialization of all-solid-state batteries but is also set to profoundly influence the broader trajectory and evolution of battery technology.

Source: #

#15 U.S. Department of Energy Establishes New Grant Program for All-Solid-State Battery Recycling Technologies to Promote Sustainable Supply Chains

Published July 03, 2026 米国エネルギー省 (U.S. Department of Energy - DOE) USA



OVERVIEW

The U.S. Department of Energy (DOE) has launched a new grant program dedicated to advancing recycling technologies for all-solid-state batteries. This strategic initiative aims to significantly boost material recovery efficiency and minimize environmental impact, thereby establishing a sustainable and circular supply chain critical for the widespread adoption of next-generation battery technology.

Background and Context

All-solid-state batteries are widely envisioned as the transformative next-generation technology for applications ranging from electric vehicles (EVs) to stationary energy storage. However, parallel to their anticipated growth in adoption, critical challenges are emerging concerning end-of-life battery processing and ensuring a stable supply of their constituent raw materials. Fundamentally, all-solid-state batteries feature distinct material compositions compared to conventional lithium-ion batteries, thereby demanding specialized recycling technologies. The DOE's grant program proactively tackles these impending challenges by accelerating technological development, with the dual aim of fostering a circular economy for resources and bolstering the resilience of the entire battery supply chain. This initiative stands as a significant policy move, addressing both environmental protection and national economic security imperatives.

Key Findings

The U.S. Department of Energy (DOE) has initiated a new grant program to foster innovative recycling technologies, marking a crucial step towards establishing a sustainable supply chain vital for the widespread adoption of all-solid-state batteries. This program is specifically designed to significantly enhance the recovery efficiency of critical materials from solid-state batteries, concurrently minimizing the environmental footprint of the recycling process.

Technical Details

The new grant program prioritizes research and development projects focused on recycling technologies uniquely adapted for all-solid-state batteries. A key emphasis is placed on supporting the advancement of efficient separation and recovery techniques for critical metals (such as lithium, cobalt, and nickel) and solid electrolyte materials (including sulfides, oxides, and polymers). Furthermore, the funding aims to enable the creation of low-cost, environmentally sustainable processes for regenerating and high-quality reuse of these recovered materials. Specific objectives include boosting recycling efficiency to surpass current lithium-ion battery recycling rates (e.g., exceeding 95%) and substantially reducing energy consumption and greenhouse gas emissions throughout the recycling process. Although the precise scale of funding has not been disclosed, it is expected to facilitate large-scale projects involving collaborations among multiple research institutions and private companies.

Strategic Significance and Outlook

This grant program is poised to accelerate innovation in all-solid-state battery recycling technologies, making a substantial contribution to the establishment of a sustainable battery ecosystem. By facilitating the re-utilization of high-quality recovered materials in the manufacturing of new batteries, the program will mitigate raw material procurement risks and potentially enhance the cost competitiveness of all-solid-state batteries. Global attention is now keenly focused on how future advancements in R&D will elevate the environmental performance and economic viability throughout the complete lifecycle of all-solid-state batteries.

Source: <#>

#16 Novel Cathode Coating Technology Reduces Interfacial Resistance, Dramatically Extending Cycle Life of All-Solid-State Batteries

Published July 04, 2026 Journal of the Electrochemical Society Unknown



OVERVIEW

A study published in the Journal of the Electrochemical Society reports that a novel coating technology applied to the cathode interface of all-solid-state batteries significantly reduces interfacial resistance and achieves extended cycle life. This innovative coating effectively suppresses interfacial side reactions during charge and discharge, preventing battery performance degradation. This opens new pathways for the commercialization of high-capacity, long-life all-solid-state batteries.

Key Findings

A recent study published in the Journal of the Electrochemical Society announces an innovative new coating technology that dramatically enhances the interfacial stability between the cathode and solid electrolyte in all-solid-state batteries. This coating successfully reduces interfacial resistance and suppresses undesirable interfacial reactions during charge-discharge cycles, thereby significantly extending the long-term cycle life of all-solid-state batteries.

Technical Details

The research team developed a unique process to form an ultrathin coating layer on the surface of the cathode active material in all-solid-state batteries. This layer is highly permeable to lithium ions and chemically stable. The coating improves the physical and chemical compatibility between the cathode and solid electrolyte, reducing interfacial charge transfer resistance by over 30% compared to conventional approaches. This enables high-current-density charging and discharging, boosting the battery's power characteristics. Furthermore, it effectively suppresses parasitic reactions where lithium ions desorb from the cathode material and react with the solid electrolyte under high potential conditions during charging. This leads to improved capacity retention over long periods, consequently extending battery lifespan significantly. Specifically, cells with this coating demonstrated a cycle life more than double that of conventional uncoated cells.

Background & Context

All-solid-state batteries are anticipated as next-generation energy storage devices promising high energy density and superior safety. However, one of the primary challenges for their commercialization has been the high resistance and instability at the interface between the electrodes and the solid electrolyte. Particularly at the cathode interface, issues such as solid electrolyte decomposition or phase changes under high potential conditions during charging have been reported. Resolving this challenge is essential for improving the performance and reliability of all-solid-state batteries, making the results of this research a significant breakthrough in the field.

Strategic Significance & Outlook

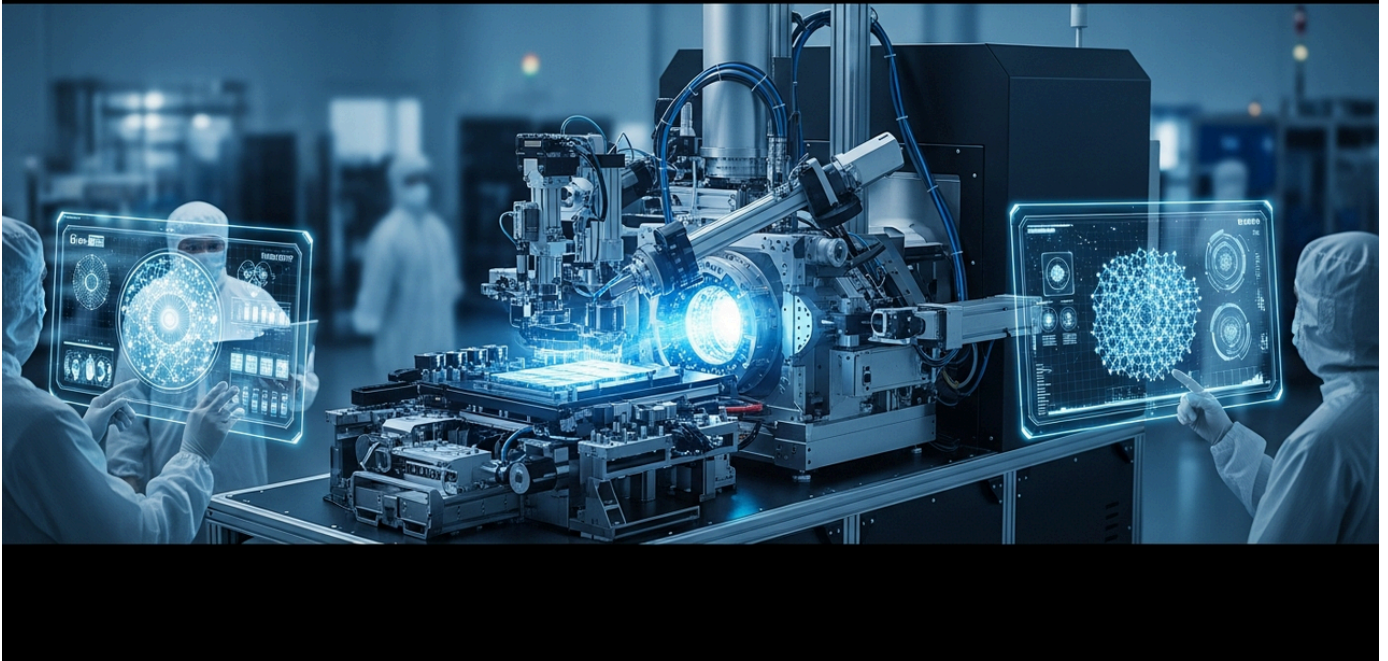
This novel cathode coating technology is set to significantly enhance the performance of all-solid-state batteries, accelerating their practical application in demanding sectors such as electric vehicles (EVs) and stationary energy storage systems, where long life and high reliability are paramount. Future challenges will include the cost-effectiveness of the coating materials, scaling up the manufacturing process, and conducting long-term durability evaluations in actual large-format battery cells. Nevertheless, this achievement lays a crucial foundation for all-solid-state batteries to become competitive across a wide range of markets.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#17 ULVAC Unveils New Deposition System for Thin-Film Solid Electrolytes, Advancing Mass Production and Cost Reduction for All-Solid-State Batteries

Published July 06, 2026 ULVAC Press Release Japan



OVERVIEW

ULVAC announced a new deposition system specifically designed for manufacturing thin-film solid electrolytes, crucial components for all-solid-state batteries. This innovative equipment features high productivity and excellent uniformity, poised to significantly reduce manufacturing costs and stabilize performance for next-generation batteries. This addresses a key manufacturing bottleneck, accelerating the commercialization of solid-state batteries.

Key Findings

ULVAC, a leading company in vacuum technology, has unveiled a new deposition system designed for the efficient manufacturing of thin-film solid electrolytes, which are indispensable for the widespread adoption of all-solid-state batteries. This innovative equipment boasts high productivity and exceptional uniformity in film thickness and composition, representing a groundbreaking technology that contributes to significant manufacturing cost reductions and performance stabilization for next-generation batteries.

Technical Details

The new deposition system developed by ULVAC is based on sputtering technology, a type of physical vapor deposition (PVD). This apparatus is capable of depositing high-quality thin-film solid electrolytes over large areas at high speeds. Specifically, through proprietary plasma control technology and a substrate transfer system, it successfully forms solid electrolyte films ranging from a few to tens of microns in thickness with high uniformity, while simultaneously doubling production throughput compared to conventional equipment. The precise control over film composition and crystalline structure is expected to maximize ionic conductivity and enhance stability at the electrode interface. This enables reduced performance variation in all-solid-state batteries, ensuring a reliable supply of high-quality products.

Background & Context

All-solid-state batteries are regarded as "dream batteries" with the potential to significantly improve the performance of electric vehicles (EVs) and various electronic devices. However, establishing manufacturing technology for solid electrolytes has been a major challenge for their mass production. Thin-film solid electrolytes are particularly important for achieving both high energy density and safety, but conventional manufacturing methods have been characterized by high costs and low production efficiency. ULVAC's new deposition system resolves this manufacturing bottleneck, serving as a critical infrastructure technology to accelerate the practical application of all-solid-state batteries. This further underscores the significant role of Japanese manufacturing technology in the next-generation battery industry.

Strategic Significance & Outlook

The introduction of this new deposition system is expected to dramatically boost the production capacity of all-solid-state battery manufacturers, improving market competitiveness through reduced manufacturing costs. The stable supply of high-quality thin-film solid electrolytes will facilitate the earlier market introduction of products like EVs and smartphones slated to incorporate all-solid-state batteries. ULVAC aims to contribute to the overall development of the all-solid-state battery industry by deploying this technology globally, providing strong support for the realization of a next-generation mobility society.

Source: <#>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#18 Dongfeng to Deploy 50,000 Solid-State Battery EVs by 2027, Initiating Mass Production of 350Wh/kg Cells in September 2026

Published July 08, 2026 ChinaEVHome China



OVERVIEW

Dongfeng Motor Group announced an aggressive roadmap to launch 100 demonstration vehicles with solid-state batteries by late 2026 and deliver 50,000 units by 2027. The company has established a 0.2 GWh pilot production line and plans to commence mass production of 350 Wh/kg solid-state batteries by September 2026. This move signifies a major step towards enhancing EV range and safety with next-generation battery technology.

Key Findings

Dongfeng Motor Group has unveiled an ambitious plan to deploy 50,000 electric vehicles (EVs) powered by solid-state batteries by 2027. This ambitious target is supported by plans to commence mass production of 350 Wh/kg solid-state batteries by September 2026. The company has already established a 0.2 GWh pilot production line, demonstrating significant progress towards large-scale manufacturing. This strategic move highlights China's leadership in advanced EV technology and is poised to accelerate the global automotive industry's adoption of solid-state batteries.

Technical / Clinical Details

The solid-state batteries under development by Dongfeng target an energy density of 350 Wh/kg. This represents a substantial leap forward compared to current mainstream lithium-ion batteries, offering the potential to dramatically extend EV driving ranges and enhance overall vehicle utility. Crucially, solid-state batteries replace flammable liquid electrolytes with solid counterparts, significantly mitigating the risk of thermal runaway and improving inherent safety. Dongfeng has successfully completed rigorous winter vehicle testing for its 350 Wh/kg solid-state battery, validating its performance and reliability in extreme conditions. The company plans to integrate this innovative battery into vehicle models by Q4 2026, transitioning from testing to real-world application. This will offer consumers electric vehicles with superior safety and extended range capabilities.

Background & Context

The global automotive industry is in the midst of an aggressive transition to electrification, with battery technology innovation at its core. Solid-state batteries are widely considered the most promising next-generation battery, attracting intense R&D competition from major players in Japan, South Korea, Europe, North America, and China. The Chinese government actively promotes the development of its New Energy Vehicle (NEV) industry and technological self-reliance as a national strategy. Dongfeng's announcement is emblematic of China's ambition to secure global leadership in the solid-state battery domain. While technical hurdles remain, the proactive investments and concrete commercialization roadmap from Chinese companies are set to significantly influence the trajectory of the entire industry.

Strategic Significance & Outlook

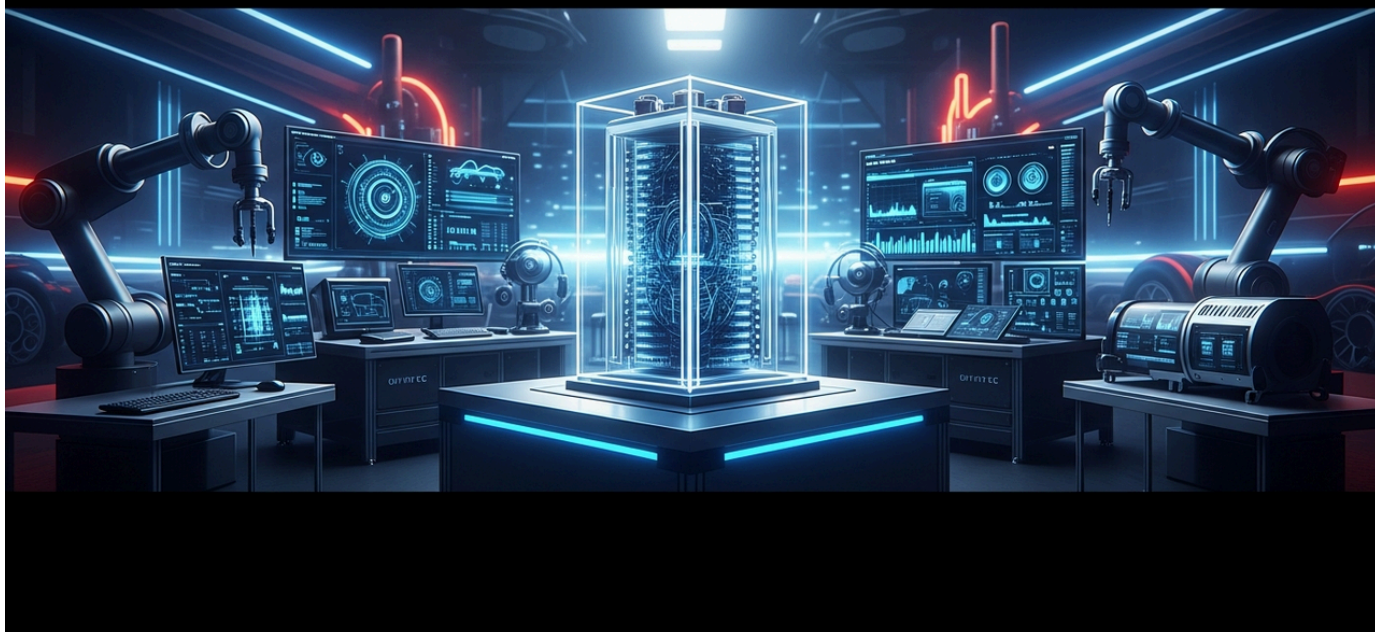
Dongfeng's announcement signals that solid-state battery commercialization is moving beyond R&D into tangible mass production and market deployment. The plan to roll out 100 demonstration vehicles by the end of 2026, followed by 50,000 production vehicles by 2027, is exceptionally aggressive. If successful, this could accelerate the penetration of solid-state battery-powered EVs into the general market at an unforeseen pace. This will further catalyze EV adoption globally and induce significant shifts in competitive strategies among automotive manufacturers. The success of Dongfeng's strategy will provide crucial insights into the standardization and cost-competitiveness of solid-state battery technology for the future, marking a critical development for the energy transition.

Source: <https://chinaevhome.com/2026/07/08/dongfeng-eyes-50000-solid-state-battery-vehicle-deliveries-by-2027/>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#19 Greater Bay Technology to Launch World's First Industrial-Scale 500 Wh/kg Solid-State Battery by 2026 for GAC Hyptec Premium EVs

Published July 02, 2026 China GBT China



OVERVIEW

Greater Bay Technology (GBT) announced plans to introduce the world's first industrial-scale solid-state battery by 2026, featuring an energy density of up to 500 Wh/kg. These advanced batteries are slated for integration into GAC Hyptec's high-end electric vehicle models. GBT asserts its proprietary composite solid electrolyte significantly enhances safety, energy density, and rapid charging capabilities, positioning it as a transformative technology for EVs.

Key Findings

Greater Bay Technology (GBT) has announced an ambitious plan to commence the world's first industrial-scale production of solid-state batteries by 2026. This pioneering battery technology is projected to achieve an energy density ranging from 260 Wh/kg to an impressive 500 Wh/kg, and is slated for integration into GAC Hyptec's high-end electric vehicle models. GBT asserts that its proprietary composite solid electrolyte significantly enhances safety, energy density, and rapid charging capabilities, positioning it as a potentially transformative technology for the global EV market.

Technical / Clinical Details

The core innovation of GBT's solid-state battery lies in its uniquely developed composite solid electrolyte. This advanced electrolyte not only demonstrates substantially higher ionic conductivity compared to conventional liquid electrolytes but also dramatically improves safety by virtually eliminating the risk of thermal runaway and fire. The standout feature is its ultra-high energy density of up to 500 Wh/kg. This capacity is nearly double that of many existing lithium-ion batteries in electric vehicles, promising a significant extension in single-charge driving range, thereby alleviating "range anxiety" for consumers. Furthermore, the technology is designed for ultra-fast charging, which could enable EVs to achieve charging speeds comparable to refueling traditional gasoline vehicles, greatly boosting convenience and accelerating widespread EV adoption.

Background & Context

Solid-state batteries are widely recognized as the ultimate next-generation technology, poised to overcome the limitations of current lithium-ion batteries. Intense research and development efforts are underway globally by major automotive and battery manufacturers. China, as the world's largest EV market, has made the development of its New Energy Vehicle (NEV) industry and technological self-sufficiency a national strategic priority. GBT's leadership in the commercialization of solid-state batteries signifies China's determined push to establish itself as a global leader in advanced energy storage. The planned supply to GAC Hyptec, a prominent automotive manufacturer, indicates that this technology is moving beyond laboratory-scale achievements into concrete market deployment.

Strategic Significance & Outlook

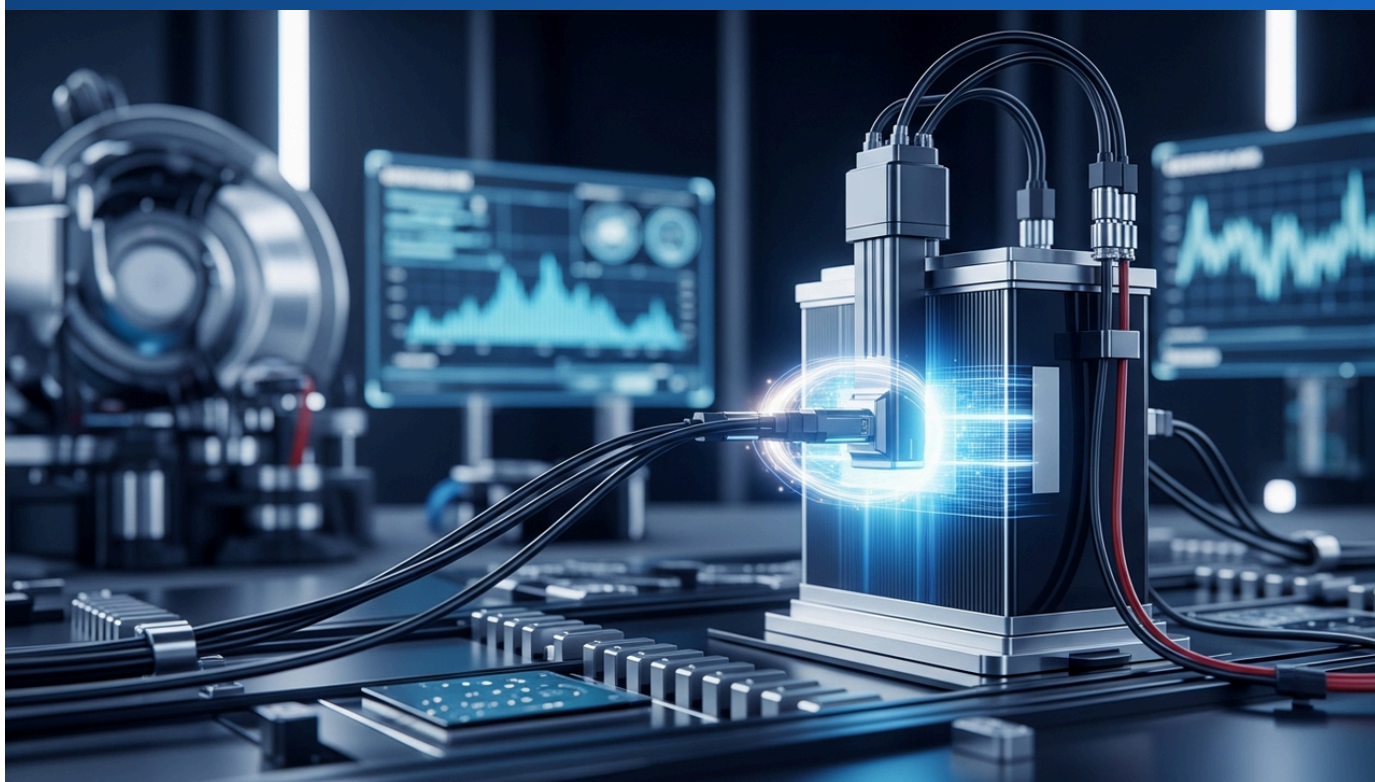
The realization of industrial-scale production by 2026 would mark a profound turning point for the electric vehicle industry. If a 500 Wh/kg solid-state battery becomes commercially viable, it has the potential to simultaneously resolve three critical consumer concerns regarding EVs: driving range, charging time, and safety. This breakthrough could dramatically accelerate the EV market, ushering in a new era of competition. Significant attention will be on how GBT's innovation reshapes the global EV competitive landscape and how other battery and automotive manufacturers respond to this advancement. This development could set new benchmarks for performance and safety, driving further investment and innovation across the battery value chain.

Source: <https://en.clickpetroleogas.com.br/china-to-launch-worlds-first-industrial-scale-solid-state-battery-in-2026-doubling-energy-storage-of-current-electric-car-batteries-davila/>

Collected: July 10, 2026 | Automated Research System (Gemini API)

#20 Novel Quaternary Alloy Anode Enables Ultra-Rapid Charging All-Solid-State Batteries: 72-Second Full Charge, 80% Capacity Retention After 2,050 Cycles

Published July 08, 2026 ACS Sustainable Chemistry & Engineering USA



OVERVIEW

Researchers have engineered a quaternary Li-Al-Si-Zn alloy anode (ASZ@Li) that significantly enhances the performance of all-solid-state batteries. Full cells utilizing this anode achieved ultra-rapid charge-discharge within 72 seconds at a 50 C rate, maintaining 80% capacity after 2,050 cycles at 20 C. This breakthrough addresses critical challenges of sluggish Li-ion transport and solid-solid interface degradation, paving the way for highly efficient and durable next-generation batteries.

Key Findings

Pioneering research has led to the development of a quaternary Li-Al-Si-Zn alloy anode (ASZ@Li) that dramatically enhances the performance of all-solid-state batteries, achieving both ultra-rapid charging and exceptional long-term durability. Full cells incorporating this novel alloy anode demonstrated complete charge-discharge cycles within an astonishing 72 seconds at a 50 C rate. Crucially, these cells maintained 80% of their initial capacity after an impressive 2,050 cycles at a high 20 C rate, representing a significant breakthrough in overcoming the critical challenges of fast charging and cycle life, which have been major impediments to solid-state battery commercialization.

Technical / Clinical Details

The developed ASZ@Li alloy anode was strategically designed to address two primary challenges in all-solid-state battery technology: sluggish lithium-ion transport kinetics and degradation at the solid-solid electrode-electrolyte interface. The multiphase structure of this alloy significantly boosts electron-ion co-conductivity, enabling ultra-fast intercalation and deintercalation of lithium ions. The ability to charge and discharge within 72 seconds at a 50 C rate is a game-changer, potentially reducing EV charging times from tens of minutes to just over a minute, profoundly improving user experience. Furthermore, the robust capacity retention of 80% after 2,050 cycles at a demanding 20 C rate underscores its excellent practical durability and extended projected battery lifespan, far exceeding the requirements for many commercial applications. The research specifically detailed mechanisms that suppress lithium dendrite growth at the interface, ensuring stable lithium migration and preventing short circuits.

Background & Context

All-solid-state batteries are widely recognized as the most promising next-generation power source across various sectors, including electric vehicles (EVs), portable electronics, and stationary energy storage systems, owing to their high energy density, superior safety (attributed to the use of non-flammable solid electrolytes), and potential for compact design. However, the slow mobility of lithium ions within solid electrolytes, high interfacial resistance between electrodes and solid electrolytes, and mechanical degradation of the interface due to electrode volume changes during cycling, have historically posed significant barriers to their practical implementation. This groundbreaking research directly confronts these fundamental technical challenges by proposing a concrete materials science solution, marking a substantial advancement on the path to solid-state battery commercialization.

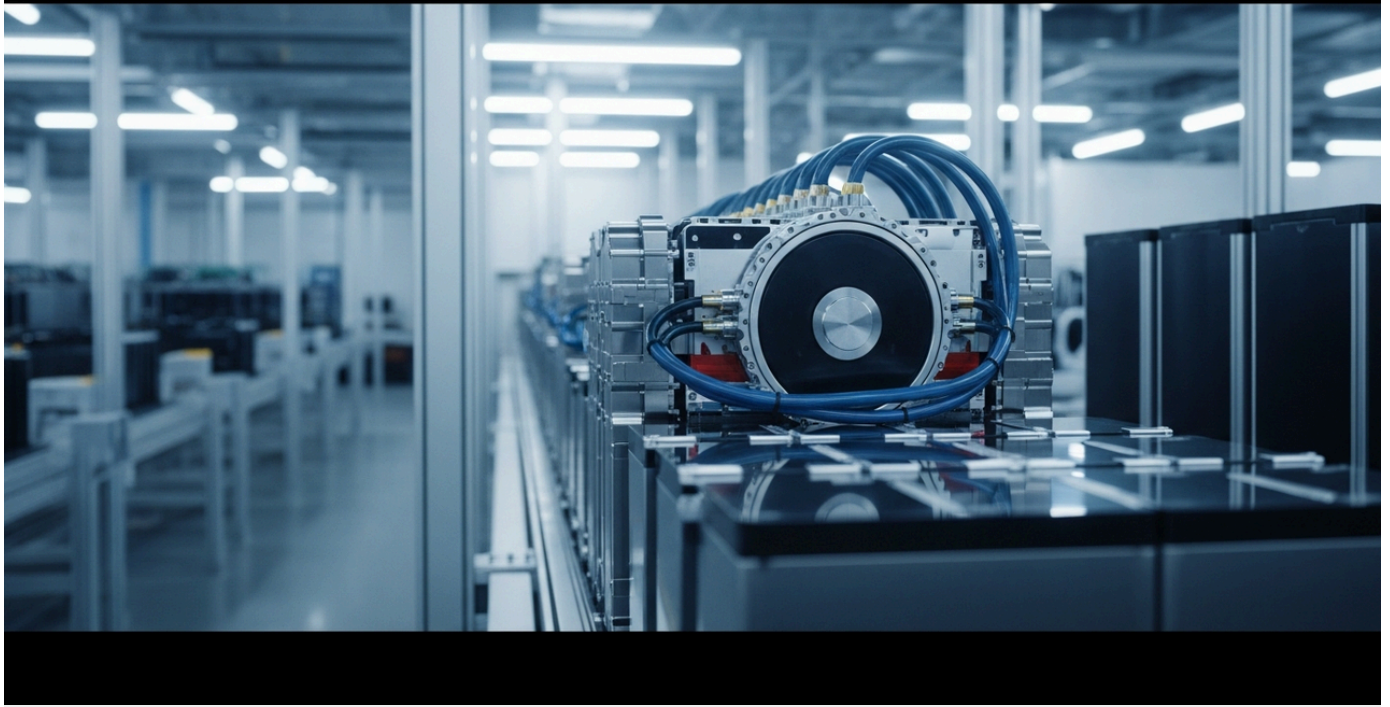
Strategic Significance & Outlook

The success of this quaternary alloy anode technology holds immense significance for accelerating the widespread adoption of all-solid-state batteries. Especially, the dual achievement of ultra-rapid charging and high durability could be a decisive factor in enhancing EV convenience, thereby driving greater consumer uptake globally. Should this technology be successfully scaled up for cost-effective mass production, it has the potential to revolutionize the entire energy storage industry. In the future, this new anode material is expected to serve as a foundation for developing even safer, longer-lasting, and higher-performance batteries, accelerating the global transition to clean energy. Further optimization of materials and development of manufacturing processes will be key areas of focus for ongoing research and development efforts.

Source: <https://pubs.acs.org/doi/10.1021/acssuschemeng.6c03084>

#21 Solid Power Accelerates Solid-State Electrolyte Production to 75 Metric Tons by 2026-End, Bolstered by BMW & SK On Partnerships and \$435M Liquidity

Published July 06, 2026 Seeking Alpha USA



OVERVIEW

Solid Power, focusing on sulfide-based solid electrolyte supply and licensing, is on track to scale electrolyte production to 75 metric tons by late 2026, supported by strategic partnerships with BMW and SK On. Despite a prolonged commercialization timeline and projected revenue decreases in 2026-2027, the company benefits from robust liquidity of \$435 million and strengthens its automotive ties with a BMW executive joining its board. This strategy emphasizes a capital-efficient, partner-driven path to solid-state battery adoption.

Key Findings

Solid Power (NASDAQ:SLDP) is strategically positioned as a key enabler in the solid-state battery ecosystem, concentrating on the supply of sulfide-based solid electrolyte materials and technology licensing, rather than direct cell manufacturing. The company has fortified its market position through robust partnerships with automotive giants like BMW and battery manufacturer SK On, and further enhanced its strategic alignment with the appointment of BMW executive Uwe Breitweg to its board of directors. This approach underscores a capital-efficient, partner-driven pathway to commercialization.

Technical & Commercial Details

Solid Power's core technology revolves around its proprietary sulfide-based solid electrolytes, known for their high ionic conductivity and promising ductility compared to other solid electrolyte materials. These properties are crucial for achieving improved energy density, enhanced safety, and potentially faster charging in all-solid-state battery (ASSB) cells. The company is actively progressing towards its goal of expanding electrolyte production capacity to 75 metric tons by the end of 2026. Recent milestones include the successful integration of their technology into BMW i7 prototype vehicles, ongoing collaboration with Samsung SDI, and validation on SK On's pilot production lines. These achievements serve as significant validation points, indicating that Solid Power's technology is meeting the stringent performance and reliability standards required by leading automotive and battery manufacturers. The business model emphasizes licensing its technology, enabling partners to leverage their existing manufacturing infrastructure for mass production of ASSBs, thereby de-risking Solid Power's capital expenditures.

Background & Industry Context

Solid-state battery technology is widely regarded as the next frontier for electric vehicles (EVs), promising breakthroughs in range, charging speed, and safety. In a crowded field of ASSB developers, Solid Power's distinct focus on materials and licensing differentiates it, allowing for concentrated R&D efforts without the immense capital burden of establishing gigafactories. The alliances with BMW, SK On, and Samsung SDI are critical endorsements, demonstrating the perceived viability and potential of Solid Power's materials for future automotive applications. However, the path to full commercialization for ASSBs remains long and complex, requiring further advancements in material costs, manufacturing scalability, and overall performance optimization. Consequently, Solid Power anticipates a decrease in annual revenues for 2026 and 2027, reflecting the extended development timelines inherent in disruptive battery technologies. This necessitates a long-term investment perspective, as the market value is largely based on future adoption.

Strategic Significance & Outlook

Solid Power's future success will largely depend on the accelerated adoption and scaling of its solid electrolyte technology by its key partners. The inclusion of a BMW executive on its board signifies a deeper strategic integration, suggesting that Solid Power's materials could play a central role in BMW's upcoming EV lineup. With \$435 million in liquidity, the company possesses a strong financial runway to continue its R&D and expand its partner ecosystem. While current financial performance reflects a pre-commercialization phase, the partner-driven approach aims to achieve revenue growth and market penetration efficiently as the broader ASSB market matures, likely post-2030. Solid Power is positioned to be a crucial material supplier as the industry transitions towards more advanced battery solutions, underpinning next-generation electric mobility and beyond.

Source: <https://seekingalpha.com/article/4919980-solid-power-cash-backed-speculative-buy-on-solid-state-battery-disruption>

#22 Samsung SDI's Solid-State Battery Samples Receive Positive Global Customer Feedback, Targeting 2027 H2 Mass Production for EVs and Robotics

Published July 02, 2026 Tech News Outlet South Korea



OVERVIEW

Samsung SDI executives confirmed positive global customer feedback on their solid-state battery samples, citing advancements in safety and energy density. The company aims for mass production by the second half of 2027, initially targeting EVs, robotics, and future Galaxy smartphones. This technology promises higher energy density, rapid charging in minutes, and significantly reduced fire risks compared to existing lithium-ion batteries, specifically addressing demand for high-density applications in confined spaces.

Key Findings

Samsung SDI has announced that its solid-state battery samples have garnered positive feedback from global customers regarding their safety and energy density. The company is accelerating towards mass production by the second half of 2027, with initial targets including electric vehicles (EVs), robotics, and future Galaxy smartphones. This endorsement signifies a critical milestone in Samsung SDI's journey to commercialize solid-state battery technology, validating its potential to address key market demands.

Technical & Commercial Details

Samsung SDI's solid-state batteries are engineered to deliver several decisive advantages over current lithium-ion counterparts. A primary benefit is the significantly increased energy density, which promises extended range for EVs and longer operational times for portable devices like smartphones and robots. The adoption of a solid electrolyte inherently boosts safety by drastically reducing the risk of fire and thermal runaway, a critical concern with liquid electrolytes, thereby enabling safer high-energy applications. Furthermore, the company aims for ultra-fast charging capabilities, potentially allowing full recharges in just minutes, dramatically enhancing user convenience. Samsung SDI established a pilot manufacturing line in March 2023 and is actively testing its solid-state cells in BMW electric vehicles through a partnership with Solid Power. The "positive feedback" from customers strongly suggests that these technical objectives are being validated at the demonstration stage, paving the way for market readiness. The high energy density and safety features are particularly appealing for robotics, where limited physical space demands maximum power within strict safety parameters.

Background & Industry Context

The battery market is experiencing rapid technological evolution driven by the proliferation of EVs, advancements in robotics, and the continuous demand for higher-performance mobile devices. While lithium-ion batteries remain dominant, they face inherent limitations in safety, energy density, and charging speed. Solid-state batteries are recognized globally as the most promising next-generation technology to overcome these challenges, prompting intense development competition among leading companies. Samsung SDI, leveraging its vertically integrated strengths in key product areas like smartphones and EVs, is at the forefront of this race. Early positive customer evaluations provide a substantial advantage for market introduction post-mass production. The emphasis on robotics applications highlights a strategic niche where the solid-state battery's unique attributes—high energy density and inherent safety—are critical differentiators.

Strategic Significance & Outlook

Should Samsung SDI commence mass production of solid-state batteries in late 2027, it will significantly impact not only the EV market but also the consumer electronics and robotics industries. Integration into high-volume products like Galaxy smartphones could rapidly acclimate consumers to solid-state technology, accelerating its broader adoption. The company's success will serve as a crucial case study for the transition of solid-state battery technology from laboratory research to commercial mass production. Key challenges ahead include cost reduction at scale, ensuring consistent quality, and establishing a robust global supply chain. Through continuous R&D and aggressive investment, Samsung SDI aims to solidify its leadership in the next-generation battery market, potentially transforming numerous sectors with its advanced energy solutions.

Source: https://www.phonearena.com/news/your-next-galaxy-phone-might-get-a-dream-battery_id181577

#23 European Argylum to Industrialize Solid Electrolytes, Ilika Ships Automotive Prototypes: Key Milestones Advance Solid-State Battery Commercialization

Published July 03, 2026 Industry Insights/Report Europe



OVERVIEW

Several critical milestones have been achieved in solid-state battery commercialization, including the establishment of Argylum by Syensqo and Axens in Europe to industrialize sulfide solid electrolytes. Ilika has shipped 10Ah solid-state battery prototypes to automotive customers, while Chinese manufacturers like Nio have already introduced semi-solid-state technology to the market. These developments highlight the rapid progression of solid-state battery technology from research to practical applications.

Key Findings

The commercialization of solid-state batteries is accelerating, with recent reports highlighting several pivotal milestones in materials development, pilot manufacturing, and early vehicle integration. Notably, the formation of a joint venture in Europe to industrialize sulfide-based solid electrolytes, the shipment of solid-state battery prototypes to automotive clients, and the market introduction of semi-solid-state batteries underscore a significant shift from laboratory-scale research to practical, real-world applications.

Technical & Commercial Details

The journey towards solid-state battery commercialization largely depends on overcoming challenges in solid electrolyte manufacturing and stability. In January 2026, Syensqo and Axens formed Argylum, a joint venture specifically aimed at accelerating the industrialization process of sulfide-based solid electrolytes. This represents a strategic move for Europe to establish leadership in a critical component of ASSB technology. Sulfide electrolytes are highly promising due to their high ionic conductivity but face challenges such as air stability and compatibility with electrode interfaces. Concurrently, UK-based battery developer Ilika has reported shipping 10Ah solid-state battery prototypes to automotive customers, a crucial step in demonstrating the capacity and performance required for vehicle applications. In China, automakers like Nio have already integrated "semi-solid-state" battery technology into their vehicles. Semi-solid-state batteries, which utilize gel-like or minimal liquid electrolytes, serve as an interim step, offering higher energy density and improved safety compared to traditional lithium-ion batteries.

Background & Industry Context

The surging growth of the electric vehicle (EV) market, coupled with an escalating demand for safer and higher-performing energy storage solutions, positions solid-state batteries as the leading next-generation battery technology. Major automakers, battery suppliers, and materials companies worldwide are investing heavily in R&D and manufacturing capabilities for this technology. While much of the development has historically been confined to laboratories, recent milestones indicate that the technology is transitioning into pilot manufacturing and initial deployment phases, bringing real-world products within reach. Reports from Europe, the UK, and China illustrate that solid-state battery development is not limited to a single region but is a global race characterized by intense competition and collaborative efforts.

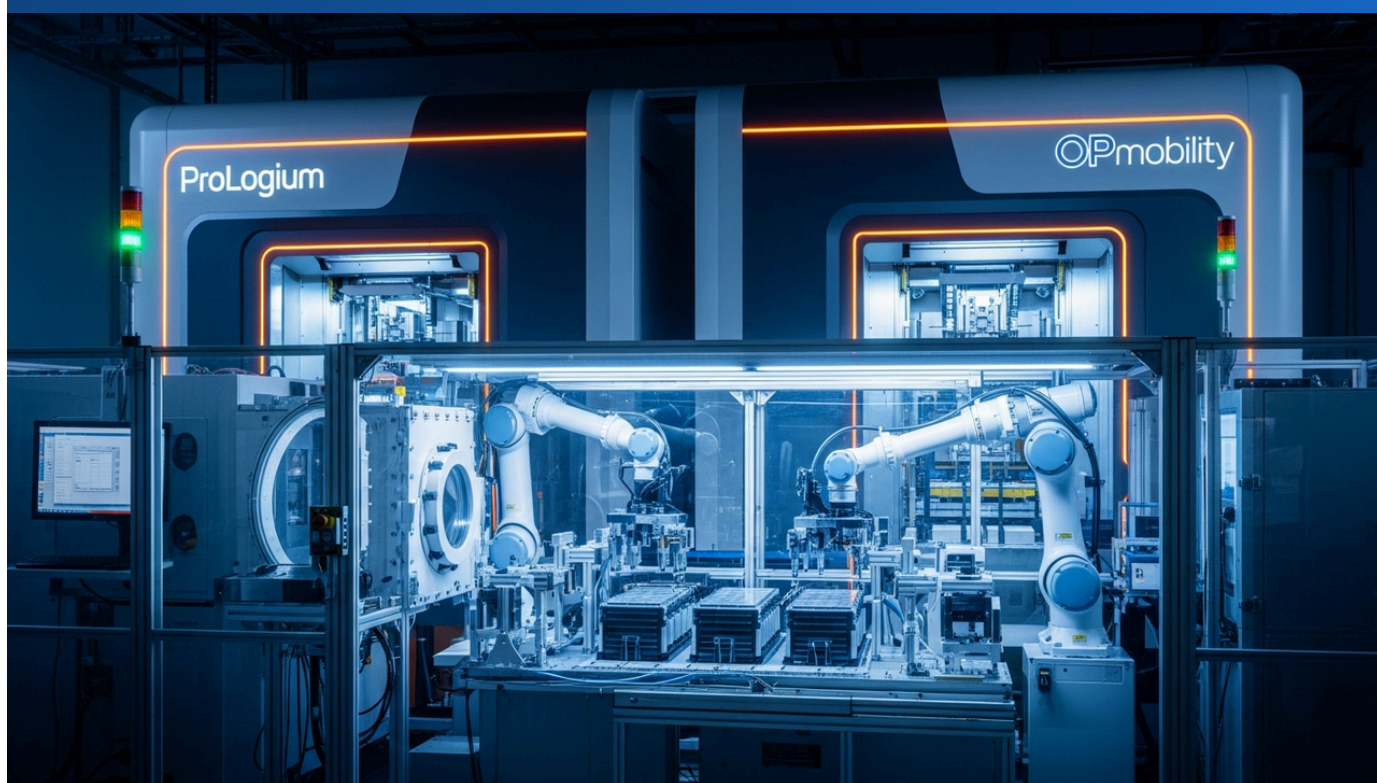
Strategic Significance & Outlook

These developments strongly suggest that solid-state batteries are moving closer to mass production in the near future. Argylum's industrialization of solid electrolytes is expected to alleviate material supply bottlenecks and contribute to reducing manufacturing costs. Prototypes like those from Ilika provide a tangible basis for OEMs to evaluate and integrate ASSB technology into their product roadmaps. Nio's market introduction of semi-solid-state batteries offers consumers an early taste of next-generation battery benefits, building anticipation for full solid-state solutions. However, significant challenges remain, including quality control at mass production scales, cost optimization, and adherence to international safety standards. Over the next few years, an increasing number of companies are expected to scale up pilot production, intensifying the competition to establish solid-state batteries as the dominant battery technology of the future.

Source: <https://engineerlive.com/latest-developments-moving-solid-state-batteries-closer-commercial-reality/>

#24 ProLogium to Go Public via SPAC Merger, Targets 4GWh Solid-State Battery Production by 2030 at Dunkirk Gigafactory; Partners with OPmobility

Published July 06, 2026 TickerSpark Taiwan



OVERVIEW

Solid-state battery developer ProLogium is set to go public in late 2026 via a SPAC merger with Translational Development Acquisition Corp. (TDAC), securing over \$1 billion in funding. The company, which claims commercialization since 2013 with over 2.4 million cells shipped, plans to establish a 4 GWh solid-state battery production capacity at its Dunkirk, France gigafactory by 2030. Furthermore, ProLogium has signed an MoU with OPmobility for joint development of next-generation solid-state battery packs, accelerating its market presence in the mobility sector.

Key Findings

ProLogium, a pioneer in solid-state battery development, is poised to go public in late 2026 through a SPAC (Special Purpose Acquisition Company) merger with Translational Development Acquisition Corp. (TDAC), securing over \$1 billion in funding. The company plans to establish a 4 GWh solid-state battery production capacity by 2030 at its first gigafactory in Dunkirk, France. Additionally, ProLogium has signed a Memorandum of Understanding (MoU) with OPmobility for the joint development and integration of next-generation solid-state battery modules and packs for electric vehicles, accelerating its real-world application in the mobility sector.

Technical & Commercial Details

ProLogium claims to have achieved commercialization of solid-state batteries as early as 2013, having shipped over 2.4 million cells from its Taiwanese gigafactory. The company's solid-state battery technology is characterized by high energy density, superior safety, and fast-charging capabilities. The SPAC merger provides a significant capital injection, crucial for supporting ambitious mass production plans such as the Dunkirk, France factory. This facility is intended to be a major supply hub for the European market, and its 4 GWh production capacity target by 2030 could significantly accelerate the commercial adoption of solid-state batteries. The MoU with OPmobility focuses on how ProLogium's solid-state battery cells will be integrated and electrically tested for mobility applications. This collaboration aims to leverage the benefits of solid-state batteries—extended range, improved charging performance, and enhanced safety—for next-generation electric mobility solutions.

Background & Industry Context

Solid-state batteries are anticipated as a "game-changer" that will dramatically improve electric vehicle (EV) performance and consumer appeal, placing the global automotive and battery industries in a fierce development race. ProLogium's public listing via a SPAC provides a vital avenue for capital access for solid-state battery companies transitioning from R&D to mass production. Historically, solid-state battery commercialization has faced challenges related to cost and scalability. However, ProLogium's early market entry track record and ambitious production capacity plans represent significant steps toward overcoming these hurdles. Partnerships with mobility solution providers like OPmobility broaden the application potential of solid-state batteries beyond just direct automotive manufacturers to a wider range of electrified mobility sectors.

Strategic Significance & Outlook

The SPAC merger and the scaling of production capacity at the Dunkirk factory will establish ProLogium as a key player in the global solid-state battery market. The partnership with OPmobility opens doors for integrating ProLogium's technology into not only electric vehicles but also other electrified mobility applications. Over the coming years, the progress of the Dunkirk factory construction, optimization of production efficiency, and securing further customer contracts will be crucial for ProLogium's market valuation and success. The secured funding of over \$1 billion provides a strong backing to steadily advance these plans. ProLogium's strategy indicates a growing commercial viability for solid-state battery technology, aiming to contribute to a broader electrified society, beyond just the automotive industry.

Source: <https://tickerspark.ai/market/prologium-spac-merger>