Energy & Storage

Field Intelligence Report

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Solid-State Batteries / Perovskite Solar Cells / Hydrogen Energy / Next-Gen Storage

Market Mood

72

/ 100 Building Momentum

Advanced Energy: From Lab to Pilot Scale

Breakthroughs in batteries, solar, and hydrogen accelerate commercialization, but scaling and supply chain challenges persist.

Solid-State Battery Energy Density	Perovskite-Silicon Tandem Efficiency	Green Hydrogen Electrolyzer Cost Reduction	US Utility-Scale BESS Capacity
400	35.5	80	52
New high	+0.3%	Significant	+70% YoY

Weekly Summary

This week, the energy and storage domain saw significant advancements across solid-state batteries, perovskite solar cells, hydrogen energy, and next-gen storage. Pilot production targets for solid-state batteries by 2027 are firming up in Asia, while perovskite solar cells achieved new efficiency records and secured initial commercial sales. Green hydrogen production is benefiting from iridium-free catalysts and substantial government investments, though a major German project was canceled. Long-duration energy storage solutions, including sodium-ion and iron-air batteries, are attracting billion-dollar investments and seeing rapid grid-scale deployment, with US capacity projected to double by 2028. Western players must strategically invest in R&D;, secure critical material supply, and scale manufacturing to maintain competitive positions.

4 Sub-Topic Summary

Sub-Topic	Headline	Momentum	Key Insight

Solid-State Batteries	Asian Firms Target 2027 SSB Pilot Production, Western Players Must Accelerate	**Accelerating**	Chinese giants BYD and CATL are aggressively targeting 2027 for small-scale solid-state battery pilot production, while Japan and South Korea lead automotive standard validation. Western players like Solid Power are pivoting to commercial electrolyte supply, but face a critical gap in large-scale cell manufacturing. Material cost reductions (50%+ for lithium sulfide) and AI-driven discovery (63,000 candidates by Cornell's IonNet) are accelerating R&D;, yet broad commercialization is not expected until 2030 due to cost and process bottlenecks.
Perovskite Solar Cells	Perovskite-Silicon Tandem Cells Achieve 35.5% Efficiency, Enter Commercial Sales Phase	**Building**	Perovskite-silicon tandem solar cells reached a new world record of 35.5% efficiency (LONGi) and are moving into commercial sales, with Tandem PV planning revenue-generating sales this year. Chinese firms are investing heavily in 100 MW pilot lines, while US DOE launched a $3M startup prize. Despite lab efficiencies exceeding 34%, challenges in long-term stability, manufacturability, and gigawatt-scale scalability remain critical for widespread adoption. Novel passivation techniques and scalable coating methods are addressing these hurdles.

Hydrogen Energy	Iridium-Free Electrolyzers Cut Costs 80%, US/EU Fund 1GW+ Green Hydrogen Projects	**Building**	Breakthroughs in iridium-free electrolyzers (Germany, Japan) promise to slash green hydrogen production costs by up to 80%, while Chinese scientists achieved 85% cost reduction with cerium oxide-embedded catalysts. The US DOE allocated $62M to 20 projects, targeting 1,000 GW electrolyzer capacity by 2050. Europe committed over $1B in new funding, but Germany's 2.1 GW HyScale 100 project was canceled due to planning uncertainties, highlighting deployment risks. Fuel cells are gaining traction for AI data centers, with Bloom Energy's stock surging 153%.
Next-Gen Storage	LDES Attracts $1.3B+ Investment, US Grid Capacity to Double by 2028	**Accelerating**	Long-Duration Energy Storage (LDES) solutions, including iron-air and thermal batteries, attracted over $1.3 billion in new investments this week, driven by data center demand and grid stabilization needs. US utility-scale BESS capacity reached 52 GW by mid-2026, projected to double to 106 GW by 2028. Sodium-ion batteries are rapidly commercializing, with CATL deploying 2 GWh in Europe and Peak Energy building America's first grid-scale plant (4 GWh/year by 2027). EU regulations mandate 65% recycling efficiency for Li-ion by 2025, emphasizing circular economy goals.

□□ JAPAN EXCLUSIVE

Energy & Storage — Weekly Intelligence from Japan

2026.08.10 — 08.16 | Sources: TDnet, METI, NEDO, Gemini Search Grounding

Toyota & Honda Accelerate Solid-State EV Battery Commercialization

Source: Gemini Grounding (various reports)

Summary: Toyota plans to launch its first solid-state EV model in the 2027-2028 timeframe, targeting a 1,000 km driving range and under 10-minute fast charging (10-80% State of Charge), with mass production ramping up around 2030. Honda, having completed a demonstratio...

WHY ENGINEERS SHOULD CARE

EV platform designers and power electronics engineers should monitor these aggressive timelines for next-generation battery integration, assessing implications for thermal management, charging infrast...

TDK Develops 1,000 Wh/L Solid-State Battery Material for Small Devices

Source: Gemini Grounding (June 2024 announcement)

Summary: TDK announced in June 2024 the development of a new solid-state battery material achieving an energy density of 1,000 Wh/L, representing an approximate 100-fold increase over its conventional solid-state batteries. This breakthrough is primarily targeted at sm...

WHY ENGINEERS SHOULD CARE

Designers of compact, power-constrained devices (wearables, IoT, medical sensors) should evaluate TDK's progress for potential integration, as a 1,000 Wh/L battery could enable significantly smaller f...

Japan Funds Grid Storage, Sodium-Ion Batteries, and Offshore Wind Expansion

Source: Gemini Grounding (METI, NEDO, MOE announcements) | 2026-12-10

Summary: Japan's Ministry of Economy, Trade and Industry (METI) and other agencies are advancing energy initiatives, including ongoing Demand Response (DR) subsidies for household and commercial storage batteries (household application deadline 2026-12-10). The New Ene...

WHY ENGINEERS SHOULD CARE

Power electronics engineers and grid infrastructure planners should note the government's commitment to DR-enabled storage, which drives demand for smart inverters and battery management systems. Batt...

This Week's Japan Technology Highlights

Japan's EV solid-state battery push intensifies, with Toyota targeting 2027-2028 commercialization for 1,000 km range, and Honda aiming for 2028 with 50% size reduction.

CATL and BYD Solid-State Battery Development: Trial Production and Energy Density Targets

■ **China's Move**

Chinese battery giants CATL and BYD are targeting small-scale trial production of solid-state battery cells in 2027 (CATL, BYD). CATL's research is at Technology Readiness Level (TRL) 4, aiming for TRL 7-8 by 2027 to enable pilot production and real-world test...

■ **Technical Verification**

[CONFIRMED]	Both CATL and BYD have publicly announced plans for small-scale trial production of solid-state battery cells in 2027. / BYD completed pilot production of a 60 amp-hour all-solid-state cell in 2024.
[BOTTLENECK]	Achieving high and consistent ionic conductivity in solid electrolytes across a wide temperature range. / Managing interfacial resistance and stability between solid electrolytes and electrodes over...

■ **Implications for Western Engineers**

- Battery R&D teams: Benchmark announced energy density targets (CATL 500 Wh/kg, BYD 400 Wh/kg) against internal roadmaps, but pri...
- EV powertrain engineers: Monitor BYD's 2027 batch demonstration installations for real-world performance data, particularly ther...
- Materials scientists: Investigate BYD's dual-electrolyte cathode architecture and CATL's sulfide-based approach for potential ad...

China's Evolving EV Battery Policy and Critical Mineral Supply Chain Control

■ **China's Move**

China is implementing significant policy shifts in its EV and battery market, moving from direct production capacity acceleration to optimizing existing resources (China government). Effective September 1, 2026, tax exemptions for lithium-ion battery manufactu...

■ **Technical Verification**

[CONFIRMED]	The termination of tax exemptions for lithium-ion battery manufacturers and the introduction of a new consumption tax (2% from Sept 1, 2026, 4% from Sept 1, 2027). / New guidelines (June 2026) for t...
[BOTTLENECK]	Adapting battery manufacturing processes and supply chains to absorb increased production costs from new taxes without compromising competitiveness or quality. / Developing robust, economically viab...

■ **Implications for Western Engineers**

- Procurement and Supply Chain teams: Factor in the new 2-4% consumption tax on Li-ion batteries into cost models for Chinese-sour...
- Legal and Compliance departments: Review the "dual-use products" export control list (high-end batteries >300Wh/kg, CAM, AAM, ma...
- Sustainability and R&D divisions: Evaluate the implications of China's accelerated battery recycling mandates, considering poten...

Key Trends This Week (5 Total)

TR-01 HIGH Cross-Domain

Global Race to Pilot Production Intensifies Across Advanced Energy

Asian Firms Lead 2027 Pilot Targets for SSBs, Perovskites, Driving Commercialization

The global race to move advanced energy technologies from lab to pilot production is intensifying, with Chinese firms like BYD and CATL targeting 2027 for solid-state battery pilot lines. Similarly, LONGi is investing $28M in a 100MW perovskite-silicon tandem pilot line. This aggressive push, particularly from Asia, is setting the pace for commercialization and creating urgency for Western players to accelerate their own scaling efforts or risk falling behind in market share and technology leadership.

SSB Pilot Production Target	Perovskite Pilot Line Investment	Perovskite Pilot Line Capacity
2027	$28M	100MW

▶ Western OEM ▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western Distributor

Refs: S1-01 S1-05 S1-11 S1-19 S2-01 S2-25

TR-02 HIGH Cross-Domain

Critical Material Innovation & Cost Reduction Drive Adoption

Iridium-Free Catalysts & Halved Li-Sulfide Prices Unlock New Cost Efficiencies

Breakthroughs in critical material innovation are significantly reducing costs and accelerating the commercial viability of advanced energy technologies. German chemists developed an iridium-free electrolyzer, potentially slashing green hydrogen stack costs by 80%. Concurrently, lithium sulfide prices, crucial for solid-state batteries, have halved in six months. These material-level advancements are essential for overcoming economic hurdles and enabling broader market adoption, particularly for Western manufacturers seeking competitive advantages.

Iridium-Free Electrolyzer Cost Reduction	Lithium Sulfide Price Reduction	Chinese PEMWE Cost Reduction
80%	50%+	85%

▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western OEM ▶ Western Foundry

Refs: S1-06 S1-10 S3-01 S3-02 S3-03 S3-05

TR-03 MED Solid-State Batteries

AI & Computational Methods Accelerate Materials Discovery

AI Identifies 63,000 Electrolyte Candidates, Speeding Battery R&D; by Years

Artificial intelligence and high-throughput computational screening are revolutionizing materials discovery, dramatically accelerating R&D; cycles. Cornell's IonNet AI identified 63,000 solid-state electrolyte candidates from chemical composition alone, bypassing traditional crystal structure data requirements. Similar computational methods are identifying interfacial stabilization coatings for halide solid electrolytes. This shift towards AI-driven R&D; offers Western companies a pathway to rapidly innovate and overcome material science bottlenecks, reducing development costs and time-to-market for next-generation energy solutions.

AI-Identified Electrolyte Candidates	Computational Screening Compounds
63,000	12,800

▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western OEM ▶ Western T&M; Provider

Refs: S1-03 S1-16 S2-07 S2-13 S2-14

TR-04 MED Next-Gen Storage

Diversification of Long-Duration Energy Storage Solutions

Iron-Air, Sodium-Ion, and Flow Batteries Attract $1.3B+ Investment for Grid Stability

The energy storage landscape is rapidly diversifying beyond lithium-ion, with significant investments flowing into long-duration energy storage (LDES) technologies. Form Energy secured $750M for iron-air batteries, and Antora Energy raised $550M for thermal batteries. Sodium-ion batteries are also seeing rapid commercialization, with CATL deploying 2 GWh in Europe and Peak Energy building a 4 GWh US plant. This diversification is crucial for grid stability, renewable integration, and reducing reliance on single chemistries, offering Western investors and utilities a broader portfolio of resilient storage options.

Form Energy Series G Funding	Antora Energy Funding	Peak Energy US Na-ion Capacity
$750M	$550M	4 GWh/year

▶ Western OEM ▶ Western Investor ▶ Western Equipment Maker ▶ Western Material Supplier

Refs: S4-01 S4-04 S4-05 S4-06 S4-13 S4-19 S4-20 S4-22 S4-23

TR-05 LOW Next-Gen Storage

Circular Economy Mandates Drive Battery Recycling Innovation

EU Regulations Set 65% Li-ion Recycling Target by 2025, Spurring Patent Surge

The European Union's Battery Regulation is setting stringent recycling targets, mandating 65% efficiency for lithium-based batteries by end-2025 and 70% by 2030, alongside specific material recovery goals. This regulatory push is driving innovation in battery recycling, evidenced by a 103% surge in related patent filings in 2026. Western companies, particularly in Europe, must invest in advanced recycling infrastructure and technologies to meet these targets, secure critical raw materials, and establish a sustainable, circular battery economy.

Li-ion Recycling Target (2025)	Battery Recycling Patent Filings Increase	EU Strategic Raw Material Recycling Target (2030)
65%	103%	25%

▶ Western OEM ▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western Foundry

Refs: S4-17 S4-30 S4-31 S4-32 S4-33

Macro Market Indicators

Indicator	Direction	Value	Note	Source
US DOE Clean Energy Funding	↑	$2.0B	Additional investment for domestic battery supply chain, including $1.4B loan to Sila Nanotechnologies.	Markets Insider (S1-07)
EU Battery Recycling Targets	↑	65	Minimum 65% recycling efficiency for Li-ion by end of 2025, 70% by 2030.	Industry Blog (S4-30)
Critical Mineral Supply Coverage (2035)	↓	68-75	Projected supply meets only 68% of lithium, 74% cobalt, 75% copper demand.	IndexBox (S4-21)
Global Green Hydrogen Production (2026)	↑	1	Projected to exceed 1% of global hydrogen production, up 20% from 2025.	IEA / Hydrogen Insight (S3-22)

Macro Environment Summary

Global energy transition efforts are accelerating, driven by significant government funding and ambitious policy targets in the US and EU. While R&D; breakthroughs are frequent, critical mineral supply chains face severe processing risks, threatening long-term supply for key technologies. The push for green hydrogen and diverse energy storage solutions is gaining momentum, but geopolitical volatility and planning uncertainties continue to pose challenges to large-scale project deployment.

Market Data: LIT (Battery & Storage) Weekly Trend

75.23 USD +1.65%

Action Recommendations by Player

Action Recommendations for Western OEM / Final Product Maker

OEM BMW, Nissan, Tesla, Xcel Energy, Google

Western OEMs like BMW and Nissan are collaborating with solid-state battery developers (Solid Power, QuantumScape) for future EV integration by FY2028. However, Chinese rivals BYD and CATL are targeting 2027 for pilot SSB production, creating a potential 12-18 month lead. In solar, Tandem PV is launching commercial perovskite-silicon modules this year, offering 30-year warranties.

Risk

- If Chinese SSB makers achieve 2027 mass production, Western OEMs without secured supply will face 18-month sourcing delays
- Failure to secure critical minerals (Li, Co, Cu) could limit battery production, with supply meeting only 68-75% demand by 2035
- Slow adoption of next-gen solar could cede market share to Asian manufacturers with 35.5% efficient modules

Opportunity

- Partner with US/EU SSB electrolyte suppliers (Solid Power, Nuvvon) to secure early access to advanced materials
- Invest in domestic LDES solutions (Form Energy, Peak Energy) to stabilize grids and power AI data centers, a $300B+ market
- Integrate high-efficiency perovskite-silicon tandem modules (35.5%+) into product lines for competitive advantage

Actions This Week

- By Q4 2026: Initiate dual-sourcing qualification for solid-state battery electrolytes with Solid Power and Nuvvon
- Within 3 months: Evaluate perovskite-silicon tandem module suppliers (Tandem PV, Oxford PV) for 2027 product roadmaps
- By Q1 2027: Develop a critical mineral supply chain resilience plan, focusing on recycling and diversified sourcing

☐ Scenario: If Chinese CATL achieves 2027 SSB mass production, Western OEMs without secured alternative supply chains will lose 12–18 months on product launch timelines — begin dual-sourcing qualification now.

☐ Quick Win : Register for the DOE Solid-State Battery Summit (August, Washington DC) and book meetings with Factorial and Solid Power BD teams this week.

Action Recommendations for Western Contract Manufacturer

CDMO/CRO BHEL, Lonza, GlobalFoundries

Western contract manufacturers are seeing increased demand for advanced energy components. BHEL (India) is partnering with thyssenkrupp nucera and Hystar for local PEM electrolyzer manufacturing. The shift to modular outdoor BESS containers due to NFPA 855 standards creates new opportunities for specialized fabrication and assembly. However, the 'mass production incurs losses' dilemma for solid-state batteries (QingTao -111.6% gross margin) highlights scaling challenges.

Risk

- High CAPEX for new advanced material production lines (e.g., solid electrolytes) may lead to initial losses
- Lack of skilled labor for novel manufacturing processes (e.g., uniform perovskite coating) could hinder scale-up
- If Western OEMs delay SSB adoption, contract manufacturers will face underutilized capacity and delayed ROI

Opportunity

- Specialize in modular BESS container fabrication, a growing market driven by NFPA 855 standards
- Partner with material developers (Sumitomo Chemical, Solivis) to scale solid electrolyte production by FY2028
- Offer pilot-scale manufacturing services for perovskite solar cells, leveraging blade coating and co-deposition techniques

Actions This Week

- By Q1 2027: Investigate modular BESS container manufacturing capabilities and NFPA 855 compliance requirements
- Within 6 months: Establish R&D; partnerships with US/EU universities (Cornell, KTU) for advanced material processing expertise
- By Q3 2027: Develop a strategic plan for scaling solid electrolyte production, targeting FY2028 mass production timelines

☐ Scenario: If the 'mass production incurs losses' dilemma persists for SSBs, Western foundries must secure long-term contracts with R&D-heavy; OEMs to de-risk initial scaling investments — prioritize strategic partnerships now.

☐ Quick Win : Attend the Perovskite Connect 2026 conference (October, Berlin) to network with module developers and material suppliers this week.

Action Recommendations for Western T&M; / Testing Provider

T&M; NREL, TÜV SÜD, Pall Corporation, Bureau Veritas

The rapid commercialization of new energy technologies is driving demand for advanced testing and certification. Nuvvon achieved safety validation for its polymer electrolyte SSB, demonstrating 2,000+ cycles and nail penetration resistance. Perovskite solar cells require rigorous long-term stability and reliability testing (IEC61215/61730). Pall Corporation emphasizes high-purity water filtration for PEM electrolyzers, highlighting the need for precise process monitoring and quality control.

Risk

- Failure to adapt testing protocols for novel materials (e.g., boride-based SSBs) could create market entry barriers
- Lack of standardized testing for emerging LDES technologies (iron-air, thermal) may slow adoption and certification
- If regulatory bodies delay new energy product certifications, T&M; providers will face reduced demand for services

Opportunity

- Develop specialized testing services for solid-state battery safety (nail penetration, thermal stability) and cycle life (2,000+ cycles)
- Offer advanced reliability and durability testing for perovskite solar modules, including high-altitude and harsh environment trials
- Provide high-purity water filtration and quality control solutions for green hydrogen PEM electrolyzer operations

Actions This Week

- By Q4 2026: Invest in new equipment and expertise for solid-state battery safety and performance validation (e.g., 400 Wh/kg cells)
- Within 6 months: Collaborate with NREL and TÜV SÜD to develop standardized testing for perovskite-silicon tandem modules
- By Q2 2027: Launch a dedicated service line for green hydrogen production quality control, focusing on water purity and catalyst integrity

☐ Scenario: If new energy technologies face unexpected safety or durability issues during pilot deployment, T&M; providers with robust, specialized testing capabilities will become indispensable — invest in advanced validation now.

☐ Quick Win : Review NFPA 855 standards for BESS and identify gaps in current testing offerings; propose new services to clients by next month.

Action Recommendations for Western Material Supplier

Material BASF, Sumitomo Chemical, Everlight Chemical, Dow, DuPont, Umicore

Western material suppliers are critical for advanced energy solutions. BASF and Siemens Energy commissioned Germany's largest 54MW PEM electrolyzer. Sumitomo Chemical plans mass production of novel solid electrolytes by FY2028. Everlight Chemical is developing encapsulation solutions for perovskite solar cells. However, critical mineral supply chains face processing risks, with projected supply meeting only 68-75% of demand for key battery minerals by 2035.

Risk

- Reliance on non-Western sources for critical minerals (Li, Co, Cu) could lead to supply disruptions and price volatility
- If iridium-free catalysts become standard, Western suppliers of precious metal catalysts will face declining demand
- Failure to scale production of novel materials (e.g., solid electrolytes, perovskite precursors) could cede market share to Asian competitors

Opportunity

- Develop and scale production of iridium-free catalysts for green hydrogen electrolyzers, targeting 80% cost reduction
- Invest in domestic processing and recycling of critical minerals to mitigate supply chain risks and meet EU targets
- Supply advanced solid electrolytes (sulfide, oxide, polymer) for SSB commercialization, a market growing towards 2030

Actions This Week

- By Q1 2027: Accelerate R&D; into iridium-free catalyst alternatives, leveraging academic breakthroughs (RIKEN, German chemists)
- Within 6 months: Secure long-term supply agreements for lithium sulfide and other SSB precursors, anticipating 2027 pilot demand
- By Q3 2027: Evaluate opportunities in battery recycling, particularly for lithium and cobalt, to meet EU 2025/2030 targets

☐ Scenario: If critical mineral supply shortages materialize by 2030, Western material suppliers without diversified sourcing or recycling capabilities will face severe production constraints — invest in circular economy solutions and new extraction methods now.

☐ Quick Win : Engage with US DOE and EU Commission on critical raw material initiatives; identify funding opportunities for domestic processing by next month.

Action Recommendations for Western Distributor / Trading Company

Distributor Solarpro Holding, Arrow, Avnet, Brenntag

Western distributors are navigating a complex market with rapid technological shifts. CATL partnered with Solarpro Holding to deploy 2 GWh of sodium-ion battery storage in Central and Eastern Europe, indicating growing demand for diverse storage solutions. The shift to modular BESS containers and the need for

high-purity water for electrolyzers create new product distribution opportunities. However, the cancellation of Germany's 2.1 GW HyScale 100 project highlights market volatility and planning uncertainties.

Risk

- Inventory obsolescence if new energy technologies (e.g., SSB) rapidly displace current offerings (Li-ion)
- Geopolitical instability impacting critical mineral supply chains could disrupt product availability and pricing
- If large-scale green hydrogen projects face further cancellations, demand for electrolyzer components will decrease

Opportunity

- Expand distribution networks for sodium-ion batteries, targeting grid-scale storage and cold-climate applications
- Offer value-added services for modular BESS container integration and deployment, leveraging NFPA 855 standards
- Distribute high-purity water filtration systems and advanced catalysts for green hydrogen production facilities

Actions This Week

- By Q4 2026: Identify and onboard new suppliers for sodium-ion battery components and complete product qualification
- Within 3 months: Develop a market entry strategy for perovskite solar modules, focusing on residential and BIPV applications
- By Q2 2027: Establish partnerships with Western electrolyzer manufacturers (thyssenkrupp nucera, ITM Power) for component distribution

☐ Scenario: If the market rapidly shifts to sodium-ion batteries for grid storage, distributors without established supply lines will lose significant market share — secure exclusive distribution agreements with emerging Na-ion manufacturers now.

☐ Quick Win : Research emerging LDES technologies (iron-air, thermal) and identify potential distribution partners; schedule introductory calls this week.

Action Recommendations for Western Equipment Maker

Equipment Siemens Energy, thyssenkrupp nucera, ITM Power, Pall Corporation, Applied Materials

Western equipment makers are crucial enablers of the energy transition. Siemens Energy commissioned Germany's largest 54MW PEM electrolyzer with BASF. thyssenkrupp nucera doubled order intake to €471M, driven by chlor-alkali and green hydrogen demand. ITM Power secured £86.5M UK funding for a gigawatt-scale electrolyzer manufacturing line. The need for scalable manufacturing processes for perovskite solar cells (blade coating) and advanced battery production lines (QuantumScape's Eagle Line) presents significant opportunities.

Risk

- Intense competition from Asian equipment makers (e.g., for SSB pilot lines) could limit market penetration
- Delays in large-scale green hydrogen projects (e.g., HyScale 100 cancellation) could impact order backlogs
- If new material processing techniques (e.g., AI-driven synthesis) require entirely new equipment, current offerings may become obsolete

Opportunity

- Supply advanced manufacturing equipment for solid-state battery pilot lines, targeting 2027 production goals
- Develop and sell scalable blade coating and co-deposition equipment for high-efficiency perovskite solar cell production
- Provide high-purity water filtration and process equipment for green hydrogen electrolyzer facilities (Pall Corporation)

Actions This Week

• By Q4 2026: Develop a sales strategy targeting Asian SSB manufacturers (BYD, CATL) for advanced production equipment

• Within 6 months: Invest in R&D; for next-generation perovskite manufacturing equipment, focusing on large-area uniformity and stability

• By Q2 2027: Partner with US DOE and EU-funded hydrogen projects to supply electrolyzer components and balance-of-plant equipment

☐ Scenario: If the transition to advanced energy technologies accelerates faster than anticipated, equipment makers without scalable, high-precision manufacturing solutions will miss significant market opportunities — invest in modular, flexible production lines now.

☐ Quick Win : Schedule technical deep-dive meetings with Solid Power and Nuvvon to understand their electrolyte manufacturing equipment needs by next month.

Impact Matrix (Players × Trends)

++ = Strong Tailwind + = Tailwind 0 = Neutral − = Headwind −− = Strong Headwind

Player	TR-01 HIGH Global	TR-02 HIGH Critic	TR-03 MED AI & C	TR-04 MED Divers	TR-05 LOW Circul
Western OEM / Final Product Maker	++	+	+	++	-
Western Contract Manufacturer	+	+	++	+	0
Western T&M; / Testing Provider	++	++	++	++	+
Western Material Supplier	++	++	++	++	++
Western Distributor / Trading Company	+	+	+	++	0
Western Equipment Maker	++	++	++	++	+

Timeline This Week (9 Events)

Date	Tag	Headline	Source
2026-08-06	milestone	BYD patents 6 SSB innovations, targets 2027 pilot production	China S1-01
2026-08-07	policy	US DOE awards $30M to 5 LDES demonstration projects	USA S4-04
2026-08-08	deal	Peak Energy selects Sacramento for 4 GWh/year US Na-ion battery plant	USA S4-19
2026-08-10	milestone	CATL joins BYD in 2027 SSB pilot race, declares 'industry-leading' progress	China S1-05, S1-11
2026-08-10	milestone	German chemists pioneer iridium-free electrolyzer, slashing costs by 80%	Germany S3-01
2026-08-11	milestone	LONGi achieves NREL-certified 35.5% efficiency for perovskite-silicon tandem cells	China S2-11
2026-08-12	deal	Form Energy secures $750M Series G funding for iron-air battery expansion	USA S4-22
2026-08-13	risk	Germany's 2.1 GW HyScale 100 electrolyzer project canceled due to planning uncertainties	Germany S3-23
2026-08-14	milestone	Nuvvon achieves safety validation for sulfide and oxide-free solid polymer electrolyte	USA S1-04, S1-20

Company Spotlight

Form Energy [-] ↑ Raised $750M Series G

Secured substantial funding, quadrupling project backlog to 80 GWh for iron-air LDES, indicating strong market confidence.

- Western investors: Evaluate Form Energy's long-term growth potential and market penetration strategy for LDES.
- Western utilities: Engage Form Energy for pilot projects to integrate multi-day storage solutions into grid infrastructure.

LONGi Green Energy [-] ↑ Achieved 35.5% Perovskite-Si Efficiency

Set a new world record for tandem solar cell efficiency and committed $28M to a 100MW pilot production line, accelerating commercialization.

- Western solar OEMs: Assess LONGi's technology roadmap and competitive implications for future module development.
- Western material suppliers: Explore partnerships with leading perovskite developers to supply high-performance precursors.

thyssenkrupp nucera [-] ↑ Doubled Order Intake to €471M

Reported significant growth in order intake for electrolyzer technology, reflecting strong demand in green hydrogen and chlor-alkali sectors.

- Western equipment makers: Analyze thyssenkrupp nucera's market strategy and identify opportunities for collaboration or competitive positioning.
- Western investors: Monitor thyssenkrupp nucera's expansion plans, particularly in India, for potential investment opportunities.

Technology Roadmap

2026

- Perovskite-silicon tandem cells exceed 34% lab efficiency (S2-02, S2-04)
- Global grid-scale stationary battery storage market exceeds $300B (S4-18)
- Solid-state battery industry enters critical engineering validation phase (S1-06, S1-10)
- US utility-scale BESS capacity reaches 52 GW, growing 70% annually (S4-12, S4-24)
- EU Battery Regulation mandates 65% Li-ion recycling efficiency by year-end (S4-30)

2027

- BYD and CATL target small-scale pilot production of solid-state batteries (S1-01, S1-05, S1-11, S1-19)
- Peak Energy's 4 GWh/year US Na-ion battery plant begins production (S4-19)
- EU Battery Regulation mandates user-replaceable batteries for portable devices (S4-32)
- European Energy's 68MW solar + 95MWh BESS project in UK begins commercial operations (S4-08)
- Monochrome to field-test perovskite PV prototype at 5,000m altitude (S2-20)

2028

- Sumitomo Chemical to mass-produce novel solid electrolyte for ASSBs (S1-08)
- Nissan aims for EV integration of solid-state batteries (S1-09, S1-14)
- US utility-scale BESS capacity projected to double to 106 GW (S4-12, S4-24)

- Tandem PV targets gigawatt-scale manufacturing for perovskite-silicon modules (S2-08)
- Aternium's clean hydrogen production facility in Delaware commences operations (S3-33)

2030

- Tandem PV targets 37% efficiency for solar modules (S2-08)
- EU Battery Regulation mandates 70% Li-ion recycling efficiency (S4-30)
- EU aims to source 25% of strategic raw materials from recycling (S4-31)
- Broad commercialization of solid-state batteries expected (S1-13)
- US DOE targets $1/kg clean hydrogen cost ('Hydrogen Shot' goal) (S3-09)

2050

- EU targets carbon neutrality (S3-19)
- US DOE targets 1,000 GW electrolyzer capacity and 50 GW fuel cells (S3-12)
- US targets net-zero emissions across the economy (S3-30)

References (115 Total)

ID	Title	Source	Date	Region	Sub-Topic
S1-01	BYD Patents Six Solid-State Battery Innovations, Targets 2027 Pilot Production with Novel Interface Contact Metric	Car News China	2026-08-06	China	Solid-State Batteries
S1-02	Solid Energies Secures $900,000 Federal Grant from U.S. Department of Energy for High-Energy Solid-State Battery Development	Solid Energies	2026-08-14	US	Solid-State Batteries
S1-03	Cornell's IonNet AI Identifies 63,000 Solid-State Electrolyte Candidates Without Crystal Structure Data, Accelerating Materials Discovery	XenoSpectrum	2026-08-11	US	Solid-State Batteries
S1-04	Nuvvon Achieves Safety Validation with Sulfide and Oxide-Free Solid Polymer Electrolyte, Drawing Global Attention	Shanghai Metals Market	2026-08-14	US	Solid-State Batteries
S1-05	CATL Joins BYD in 2027 Solid-State Battery Pilot Race, Declaring 'Industry-Leading' Progress	Car News China	2026-08-10	China	Solid-State Batteries
S1-06	Solid-State Batteries Enter Critical Engineering Phase: Japan, Korea Lead Automotive Standards as Key Material Costs Halve	TrendForce	2026-08-13	Taiwan	Solid-State Batteries
S1-07	U.S. Government Commits Additional $2 Billion to Domestic Battery Supply Chain, Including $1.4 Billion Loan to Sila Nanotechnologies	Markets Insider	2026-08-10	US	Solid-State Batteries
S1-08	Sumitomo Chemical to Mass-Produce Novel Solid Electrolyte for All-Solid-State Batteries by FY2028, Redefining Battery Materials Strategy	Yahoo! ( )	2026-08-13	Japan	Solid-State Batteries
S1-09	Solid-State Battery Summit Reveals New Industry Timeline: Oxides Prioritized, Sulfides Delayed to 2028+, Baihu Institute Achieves 400Wh/kg with Boride	Solid-state Battery Weekly Analysis	2026-08-14	US	Solid-State Batteries
S1-10	Japan, South Korea Push All-Solid-State Batteries to Engineering Validation as Key Material Costs Halve	BigGo Finance	2026-08-13	Global	Solid-State Batteries
S1-11	Global Leader CATL Targets 2027 for All-Solid-State Battery Pilot Production, Prioritizing High-End EVs	STARNEWS / Car News China	2026-08-10	China	Solid-State Batteries
S1-12	Solid Power Pivots to Commercial Electrolyte Supply for Solid-State Batteries, Bolstering Partnerships with BMW, SK On, and Samsung SDI	Investing.com	2026-08-13	US	Solid-State Batteries

ID	Title	Source	Date	Region	Sub-Topic
S1-13	Solid-State Battery IPOs Ignite Race to Market, But Steep Losses Unmask Commercialization Hurdles	Shanghai Metals Market (SMM)	2026-08-10	東アジア	Solid-State Batteries
S1-14	6th Global Solid-State Battery Summit: Nissan Targets 2028 EV Integration, China Pursues Semi-Solid, while Japan-Korea Lead Full Solid-State with Sulfide, Oxide, and Halide Systems	SunSirs	2026-08-13	Global	Solid-State Batteries
S1-15	Solivis Secures 23 Billion Won in Series C Funding to Dramatically Scale Sulfide Solid Electrolyte Production Capacity	DigitalToday / Solivis Press Release	2026-08-13	South Korea	Solid-State Batteries
S1-16	High-Throughput Computational Screening Identifies Interfacial Stabilization Coatings for Halide Solid Electrolytes in High-Voltage All-Solid-State Sodium-Ion Batteries	ResearchGate / PMC	2026-08-12	Global	Solid-State Batteries
S1-17	QuantumScape Reports Progress on "Eagle Line" for Scalable Pilot Production of High-Energy-Density QSE-5 All-Solid-State Batteries, Accelerating EV Commercialization	Nasdaq / TradingView	2026-08-11	US	Solid-State Batteries
S1-18	Solid-State Battery Unicorns WeLion, QingTao, and ProLogium Race for IPO Dominance in 2026	Shanghai Metals Market (SMM)	2026-08-10	China	Solid-State Batteries
S1-19	BYD to Launch Small-Scale Solid-State Battery Production and Testing in 2027, Revolutionizing EV Range and Safety	CarsGuide	2026-08-07	Australia	Solid-State Batteries
S1-20	Nuvvon Advances Polymer Electrolyte Solid-State Battery Commercialization, Demonstrating Over 2,000 Cycles and Broad Temperature Range	Shanghai Metals Market (SMM)	2026-08-13	US	Solid-State Batteries
S2-01	LONGi Commits $28M to 100MW Silicon-Perovskite Tandem Pilot Line in China, Validating 35.5% World Record Efficiency	Perovskite-Info	2026-08-12	China	Perovskite Solar Cells
S2-02	JinkoSolar Achieves 33.84% Tandem Solar Cell World Record as Perovskite-Silicon Cells Surpass 34% Lab Efficiency	Facebook	2026-08-11	International	Perovskite Solar Cells
S2-03	Yunnan University Team Achieves Record 20.96% Efficiency in Inorganic Perovskite Solar Cells via Sulfonamide Surface Passivation	Perovskite-Info	2026-08-12	China	Perovskite Solar Cells
S2-04	Perovskite-Silicon Tandem Modules: Lab Efficiencies Exceed 34%, But Face Major Manufacturing and Durability Hurdles for Commercialization	Rayzon Solar	2026-08-06	International	Perovskite Solar Cells
S2-05	GCL Optoelectronics Raises Over $14M, Achieves 30.23% Efficiency for 2042 cm² Tandem Module and World Record for Flexible Perovskite Modules	Perovskite-Info	2026-08-07	China	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-06	Perovskite Solar Cells Achieve 33.9% Tandem Efficiency Record, Offering Low-Cost Manufacturing to Accelerate Renewable Energy Adoption	Bajaj Finserv	2026-08-13	India	Perovskite Solar Cells
S2-07	Synergistic Self-Passivation Unlocks 1000x Carrier Lifetime Boost in Perovskites, Enhancing Defect Tolerance for Next-Gen Solar Cells	ACS Publications	2026-08-11	International	Perovskite Solar Cells
S2-08	Tandem PV to Launch Sales of World's Most Efficient Solar Panels This Year, Targeting 37% Efficiency by 2030 with 30-Year Warranty	PV Magazine	2026-08-14	US	Perovskite Solar Cells
S2-09	Kaunas University of Technology Engineers Stable Perovskite Tandem Solar Cells, Hitting Over 29% Efficiency and Eliminating Key Degradation Pathway	Kaunas University of Technology (KTU)	2026-08-12	リトアニア	Perovskite Solar Cells
S2-10	Blade-Coated Perovskite Solar Cells Hit 26.60% Efficiency, Demonstrate Scalability with 23.31% on Mini-Modules	Perovskite-Info	2026-08-14	International	Perovskite Solar Cells
S2-11	LONGi Achieves NREL-Certified World Record 35.5% Efficiency with High-Performance Crystalline Silicon-Perovskite Tandem Solar Cell Technology	Facebook (LONGi Solar)	2026-08-06	China	Perovskite Solar Cells
S2-12	Thiol Chemistry Unleashes Durable Perovskite Solar Cells: A Breakthrough in Defect Passivation and Ion Migration Suppression	Chem (The Royal Society of Chemistry)	2026-08-12	International	Perovskite Solar Cells
S2-13	Double-Sided Advantage: Bifacial Interface Engineering with CF3–PEAI Propels Perovskite Memristors for Advanced Neuromorphic AI	ACS Publications	2026-08-13	International	Perovskite Solar Cells
S2-14	FAI-Induced Defect Passivation Significantly Boosts Performance of Spray-Deposited Lead-Free Cs3Bi2I9 Self-Powered Photodetectors	ACS Publications	2026-08-11	International	Perovskite Solar Cells
S2-15	Perovskite-Silicon Tandem Cells Emerge as Next Major Solar Upgrade, Targeting Over 37% Efficiency; Future Pipeline Includes All-Perovskite and Quantum Dot Cells	Medium (Maxeon Solar Panels)	2026-08-12	International	Perovskite Solar Cells
S2-16	Everlight Chemical Supports Perovskite Commercialization with Encapsulation Materials and Expertise in Scalable Manufacturing, Reliability Testing	Perovskite-Info	2026-08-11	Taiwan	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-17	Chinese Academy of Sciences Develops Scalable Co-Deposition Strategy for High-Efficiency Perovskite Solar Cells, Reaching 26.60% and Significantly Boosting Long-Term Stability	Chinese Academy of Sciences (EurekAlert)	2026-08-10	China	Perovskite Solar Cells
S2-18	Chinese Academy of Sciences Team Sets New World Record with 28.04% Certified Efficiency for Perovskite-Organic Tandem Solar Cells, Demonstrates High Stability and Roll-to-Roll Compatibility	Pandaily.com	2026-08-12	China	Perovskite Solar Cells
S2-19	U.S. DOE Launches $3M Perovskite Startup Prize to Accelerate Commercialization of High-Efficiency Tandem and Flexible Modules for Residential Market	U.S. Department of Energy (DOE)	2026-08-07	US	Perovskite Solar Cells
S2-20	Japanese BIPV Manufacturer Monochrome to Field-Test Perovskite PV Prototype at Over 5,000m Altitude to Assess Performance and Durability	pv magazine Global	2026-08-12	Japan	Perovskite Solar Cells
S2-21	SCAPS-1D Simulation Unveils Thermal Performance Limitations in Lead-Free CH3NH3SnBr3 Perovskite Solar Cells	MDPI	2026-08-14	International	Perovskite Solar Cells
S2-22	U.S. DOE Strategically Reallocates $71M in Congressional Perovskite Funding to Drive Efficiency, Reliability, and Material Development	Innovation Waypoints	2026-08-12	US	Perovskite Solar Cells
S2-23	Nanjing University & Renshine Achieve 22% Certified Efficiency on Meter-Scale Perovskite Modules, Demonstrating Up to 5.81% Monthly Power Gain Over Silicon in Field Tests, Published in Nature	Pandaily	2026-08-13	China	Perovskite Solar Cells
S2-24	Chinese Academy of Sciences Achieves World Record 28.04% Efficiency in Solution-Processable Perovskite-Organic Tandem Solar Cells, Demonstrating 90% Retention After 625 Hours	Pandaily	2026-08-12	China	Perovskite Solar Cells
S2-25	LONGi Invests ¥240 Million in 100 MW Silicon-Perovskite Tandem Solar Cell Pilot Line, Accelerating Commercialization After Achieving 35.5% Efficiency	Energytrend	2026-08-12	Taiwan	Perovskite Solar Cells
S2-26	DOE Reports Small Perovskite Solar Cell Efficiency Exceeds 26%, Tandem Near 34% in 2026; Fraunhofer ISE Achieves Over 33% on 210mm-Compatible Platform	Market.us	2026-08-11	US	Perovskite Solar Cells
S2-27	Perovskite Connect 2025 Illuminates Robust Industry Ecosystem with Key Global Players	Perovskite-Info	2026-08-11	International	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-28	Oxford PV to Detail 2024 World-First Commercial Shipment and >30% Efficiency Module Roadmap at Perovskite Connect 2026	Perovskite-Info	2026-08-06	Germany	Perovskite Solar Cells
S2-29	Enecoat Technologies to Showcase Advanced Perovskite Solar for Sustainable Urban Futures at GREEN×EXPO 2027	— —	2026-08-06	Japan	Perovskite Solar Cells
S3-01	German Chemists Pioneer Iridium-Free Electrolyzer, Slashing Green Hydrogen Costs by 80%	Nature Communications	2026-08-10	Germany	Hydrogen Energy
S3-02	RIKEN Pioneers Cost-Effective Manganese Catalyst for High-Efficiency Green Hydrogen Production	Facebook経由	2026-08-10	Japan	Hydrogen Energy
S3-03	Chinese Scientists Cut PEMWE Green Hydrogen Production Costs by 85% and Boost Efficiency by 65% with Cerium Oxide-Embedded Iridium Catalyst	Facebook	2026-08-10	China	Hydrogen Energy
S3-04	BASF and Siemens Energy Commission Germany's Largest 54MW PEM Electrolyzer, Targeting 72,000 Tons CO_2 Reduction Annually	Facebook	2026-08-10	Germany	Hydrogen Energy
S3-05	Carbon-Based Catalysts Advance Hydrogen Production in Microbial Electrolysis Cells, Offering Low-Cost Platinum Alternatives	The Royal Society of Chemistry	2026-08-14	UK	Hydrogen Energy
S3-06	Revolutionary Nano-Carbon Catalyst Unlocks Stable, Efficient Fuel Cells with Trace Platinum for Data Centers and Beyond	ScienceDaily	2026-08-08	US	Hydrogen Energy
S3-07	Pall Corporation Emphasizes Critical Role of High-Purity Water Filtration for PEM Electrolyzers in Green Hydrogen Production	Pall Corporation	2026-08	US	Hydrogen Energy
S3-08	Power to Hydrogen Unveils World's First Industrial 0.5MW AEM Electrolyzer at Port of Antwerp-Bruges, Targeting 65% Green Hydrogen CAPEX Reduction	Power to Hydrogen	2026-08-11	Belgium	Hydrogen Energy
S3-09	Lancaster, Texas, Activates Clean Hydrogen Production Facility Powered by Dedicated Wind and Solar, Flagship for U.S. 'Hydrogen Shot' Goal	Facebook	2026-08-11	US	Hydrogen Energy
S3-10	Ohio State University Develops New Process for Green Hydrogen Production with Negative Emissions from CO2 and Industrial Waste	Ohio State News	2026-08-06	US	Hydrogen Energy
S3-11	NASA Develops Regenerative Fuel Cell (RFC) Technology Functioning Like Rechargeable Batteries for Long-Duration Space Exploration Energy Storage	NASA TechPort	2026-08-07	US	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-12	U.S. DOE Report Targets 1,000GW Electrolyzer Capacity and Over 50GW Fuel Cells by 2050, Assessing Supply Chain	Department of Energy (DOE)	2026-08-07	US	Hydrogen Energy
S3-13	U.S. Department of Energy Outlines Hydrogen as 'Flexible Energy Carrier' Capable of Production from Diverse Domestic Resources	Department of Energy (DOE)	2026-08-07	US	Hydrogen Energy
S3-14	Bloom Energy Expands MiTAC Partnership to Power AI Data Centers On-Site, Stock Surges 153%	Bloom Energy Investor Relations	2026-08-06	US	Hydrogen Energy
S3-15	thyssenkrupp nucera Hands Over State-of-the-Art Chlor-Alkali Plant to Chlorum Solutions in Palmeira, Brazil, Now Operational	thyssenkrupp nucera Newsroom	2026-08-07	Germany	Hydrogen Energy
S3-16	thyssenkrupp nucera and BHEL Sign Strategic Collaboration to Advance Green Hydrogen Electrolyzer Manufacturing in India	thyssenkrupp nucera Newsroom	2026-08-07	Germany	Hydrogen Energy
S3-17	Berenberg Raises ITM Power Target Price Following £86.5M UK Government Funding for Gigawatt Electrolyzer Manufacturing	Research the market	2026-08-07	UK	Hydrogen Energy
S3-18	Plug Power Reports Q2 Revenue of $178M, Ups Full-Year Guidance to 15-16%, Targets Q4 EBITDAS Break-Even	Plug Power Inc. Investor Relations	2026-08-10	US	Hydrogen Energy
S3-19	EU Commission Updates Hydrogen Strategy to Achieve 2050 Carbon Neutrality, Sets 2030 Production Targets	European Clean Hydrogen Alliance (ECHA)	2026-08-10	EU	Hydrogen Energy
S3-20	thyssenkrupp nucera Doubles Order Intake to €471M in First Nine Months of Fiscal Year 2025/2026	thyssenkrupp nucera Newsroom	2026-08-12	Germany	Hydrogen Energy
S3-21	NEOM's $8.5 Billion Green Hydrogen Plant Enters Commissioning, Poised for 600 Tons/Day Output	SolarQuarter	2026-08-13	Saudi Arabia	Hydrogen Energy
S3-22	IEA Launches 'Global Hydrogen Review 2026,' Highlighting Hydrogen's Role in Energy and Food Security Amidst Geopolitical Volatility	IEA / Hydrogen Insight	2026-08-10	Global	Hydrogen Energy
S3-23	Germany's 2.1 GW HyScale 100 Electrolyzer Project Canceled Due to Planning Uncertainties	pv magazine (The Hydrogen Stream)	2026-08-14	Germany	Hydrogen Energy
S3-24	Hystar and BHEL Partner for Local PEM Electrolyzer Manufacturing in India, Boosting Domestic Green Hydrogen Production Capacity	pv magazine (The Hydrogen Stream)	2026-08-14	Norway /India	Hydrogen Energy
S3-25	Italy Unveils €400 Million Annual Green Hydrogen Scheme to Drive Decarbonization	pv magazine (The Hydrogen Stream)	2026-08-14	Italy	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-26	LANXESS First to Deploy Hydrogen Fuel in Industrial Process at Krefeld-Uerdingen Plant, Cutting 6,000 Tons CO2 Annually	NewswireToday	2026-08-14	Germany	Hydrogen Energy
S3-27	Europe Fuels Green Hydrogen Future with Over $1 Billion Investment: Spain, Netherlands Lead the Charge	pv magazine	2026-08-07	/Netherlands	Hydrogen Energy
S3-28	U.S. DOE Allocates $62M to 20 Projects Across 15 States to Advance National Clean Hydrogen Strategy	U.S. Department of Energy (DOE)	2026-08-07	US	Hydrogen Energy
S3-29	Fusion Fuel Green Subsidiary Marks Major Milestones in Southern European Green Hydrogen Deployments	Markets Insider	2026-08-12	(一)	Hydrogen Energy
S3-30	U.S. DOE Hydrogen and Fuel Cell Technologies Office (HFTO) Announces Funding Opportunity to Advance National Clean Hydrogen Strategy	HigherGov	2026-08-13	US	Hydrogen Energy
S3-31	Fuel Cell Energy's SOFC Achieves Commercial Maturity for AI Data Center On-Site Power Demand	EnkiAI	2026-08-07	US	Hydrogen Energy
S3-32	SFC Energy Achieves Record H1 2026 Revenue with 47.1% Gross Margin, Driven by Increased Fuel Cell Orders to Ukraine	S&P; Global (Market Intelligence)	2026-08-14	Germany	Hydrogen Energy
S3-33	Aternium Plans Clean Hydrogen Production in Dover, Delaware, Using Zero-Emission Power Without Federal Aid	Delaware Public Media	2026-08-07	US	Hydrogen Energy
S4-01	DOE Defines Long-Duration Energy Storage: 10+ Hour Discharge Capacity Crucial for Renewable Integration	Zion Technologies	2026-08-12	New Zealand	Next-Gen Storage
S4-02	Scatec Activates Africa's Largest Hybrid Power Plant: Egypt's Gigawatt-Scale Obelisk Solar-Storage Project Enters Full Commercial Operation	Energy-Storage.News	2026-08-13	エジプト	Next-Gen Storage
S4-03	ACS Review Highlights Critical Need for Cathode Material Optimization to Drive Industrial Adoption of Sodium-Ion Batteries	ACS Publications (ACS Applied Energy Materials)	2026-08-10	US	Next-Gen Storage
S4-04	U.S. Department of Energy Awards $30 Million to Five Long-Duration Energy Storage Demonstration Projects, Including Organic Flow Batteries and Thermal Storage	U.S. Department of Energy (OCED)	2026-08-07	US	Next-Gen Storage
S4-05	Diverse Long Duration Energy Storage Solutions Commercialized in 2026: From India's 100MWh Vanadium Flow Battery to North America's Sodium-Chromium Oxide Storage	iGrow News	2026-08-14	Global	Next-Gen Storage

ID	Title	Source	Date	Region	Sub-Topic
S4-06	CATL's Naxtra Sodium-Ion Batteries Powering EVs and Mining Trucks in China, Accelerating Commercial Adoption with 175 Wh/kg and 10,000+ Cycles	Wikipedia	2026-08	China	Next-Gen Storage
S4-07	International Scientists Review Sodium-Ion Battery Prototypes Approaching 200 Wh/kg, Poised as Lower-Cost, Sustainable Alternative	ESS News / pv magazine	2026-08-10	International	Next-Gen Storage
S4-08	European Energy Secures £58.1 Million for 68MW Solar + 95MWh BESS Project in Cornwall, UK, Commercial Operations Set for 2027	PV Tech	2026-08-11	UK	Next-Gen Storage
S4-09	Mexico's La Esperanza Solar-BESS Project Secures Funding: 420MW Solar PV Paired with 750MWh Storage	Energy-Storage.News	2026-08-11	Mexico	Next-Gen Storage
S4-10	Tokyo University of Science Research Achieves 91.2% Capacity Retention (After 300 Cycles) in Sodium-Ion Battery Electrodes via Scandium Doping and Surface Coating	EurekAlert! (Peer-Reviewed Publication: Small)	2026-08-11	Japan	Next-Gen Storage
S4-11	NTPC India Seeks Pilot LDES Systems, Including Gravity, CO2, Air, and Advanced CAES, to Drive Renewable Energy Integration	NTPC Limited	2026-08-07	India	Next-Gen Storage
S4-12	US Utility-Scale BESS Capacity Projected to Double to 106GW by 2028 with Additional 54GW Online	Energy-Storage.News	2026-08-12	US	Next-Gen Storage
S4-13	CATL Partners with Solarpro Holding to Deploy 2 GWh of Sodium-Ion Battery Storage in Central and Eastern Europe	ElectricDrives (Facebook)	2026-08-07	China	Next-Gen Storage
S4-14	ACS Review Highlights Critical Role of Sodium Compensation for Achieving 100% Initial Coulombic Efficiency in Sodium-Ion Batteries (SIBs)	ACS Publications (ACS Applied Energy Materials)	2026-08-07	US	Next-Gen Storage
S4-15	Nadion Energy Launches Sodium-Ion Starting Battery Series for Motorcycles and ATVs, Offering Drop-in Replacement for Lead-Acid Batteries	Nadion Energy	2026-08-11	US	Next-Gen Storage
S4-16	Research Shows Optimized Particle Structure in Sodium-Ion Battery Cathodes Achieves 96.7% Capacity Retention After 300 Cycles, Suppressing Hidden Cracking	Bioengineer.org (Study published in eScience Energy)	2026-08-12	Unknown	Next-Gen Storage
S4-17	Puget Sound Energy Announces Decommissioning and Recycling of 2MW/4.4MWh Glacier Lithium-Ion BESS Installed in 2016	PSE (Puget Sound Energy)	2026-08-06	US	Next-Gen Storage
S4-18	Global Grid-Scale Stationary Battery Storage Market Exceeds $300 Billion in 2026, LFP Dominates with 8,000-10,000 Cycle Performance	AnengJi Power	2026-08-10	Global	Next-Gen Storage

ID	Title	Source	Date	Region	Sub-Topic
S4-19	Peak Energy to Build America's First Grid-Scale Sodium-Ion Battery Plant in Sacramento, Targeting 4 GWh Annual Production by Early 2027	Intelligent Living	2026-08-08	US	Next-Gen Storage
S4-20	Australian Vanadium and Alcoa to Jointly Study 50-80MW/400-640MWh Vanadium Flow Battery Deployment at WA Alumina Refineries	IndexBox	2026-08-06	Australia	Next-Gen Storage
S4-21	IndexBox Cites IEA Report: Critical Mineral Supply Chains Face Severe Processing Risks Through 2035, Meeting Only 68-75% of Lithium, Cobalt, Copper Demand	IndexBox	2026-08-11	Global	Next-Gen Storage
S4-22	Form Energy Fuels Iron-Air Battery Expansion with $750M Series G, Surging Backlog to 80 GWh	Form Energy	2026-08-12	US	Next-Gen Storage
S4-23	Long-Duration Energy Storage Attracts Billion-Dollar Investments for Iron-Air and Thermal Batteries	Forbes	2026-08-12	US	Next-Gen Storage
S4-24	U.S. Grid-Scale Battery Capacity Grew 70% Annually Over Three Years, Reaching 52 GW by Mid-2026	U.S. Energy Information Administration (EIA)	2026-08-07	US	Next-Gen Storage
S4-25	NFPA 855 Fire Standards Mandate Shifts BESS Deployments to Outdoor Modular Containers, Driven by Safety and Efficiency	Energy-Storage.News	2026-08-13	US	Next-Gen Storage
S4-26	California's Battery Storage Exceeds 21 GW, Stabilizing Natural Gas Prices as Capacity Set to Double by 2028	Natural Gas Intelligence (NGI)	2026-08-11	US	Next-Gen Storage
S4-27	Sodium-Ion Battery Prototypes Approach 200 Wh/kg, Outperforming LFP in Extreme Cold	pv magazine Global	2026-08-10	Germany	Next-Gen Storage
S4-28	U.S. Battery Storage Capacity Surges 70% Annually Over Three Years to 52 GW, With 54 GW More Planned by 2028	pv magazine Global (via Facebook)	2026-08-13	US	Next-Gen Storage
S4-29	AnengJi Launches Liquid-Cooled BESS Containers for Industrial and Grid-Scale Applications, Emphasizing Rapid Deployment and High Reliability	AnengJi	2026-08-07	China	Next-Gen Storage
S4-30	EU Battery Regulation Sets EV Battery Recycling Efficiency Target at 65% by End of 2025, Strengthening Lithium Recovery	Industry Blog	2026-08-09	EU	Next-Gen Storage
S4-31	EU Critical Raw Materials Act Drives Battery Recycling Targets with Enhanced Africa Cooperation, Patent Filings Up 103%	European Council on Foreign Relations	2026-08-10	EU	Next-Gen Storage

ID	Title	Source	Date	Region	Sub-Topic
S4-32	EU Battery Regulation to Take Effect on February 18, 2027, Mandating User-Replaceable Batteries for Smartphones and Portable Devices	In Compliance Magazine (via Facebook)	2026-08-11	EU	Next-Gen Storage
S4-33	CATL Slashes EV Battery Repair Costs Tenfold to $1,480, Launches 48-Hour Mobile Repair Service in 100 Global Cities	Industry News	2026-08-14	China	Next-Gen Storage

Editor's Note

Navigating the Energy Transition: Western Strategy Imperatives

The past week underscores a pivotal moment in the global energy transition, characterized by rapid technological maturation and intensifying commercialization efforts. While R&D; breakthroughs in solid-state batteries, perovskite solar cells, and green hydrogen are abundant, the critical challenge for Western manufacturers, investors, and executives lies in translating these innovations into scalable, cost-effective production. Asian competitors are demonstrating aggressive timelines for pilot production, particularly in advanced batteries and solar, necessitating a proactive and integrated Western response.

To maintain competitive relevance, Western players must prioritize strategic investments across the entire value chain. This includes securing diversified and resilient critical mineral supply chains, accelerating domestic manufacturing capabilities for next-generation components, and fostering robust R&D; partnerships to leverage AI-driven material discovery. The surge in long-duration energy storage deployments and the push for circular economy mandates also present significant opportunities for those who can adapt quickly and strategically.

The cancellation of a major German hydrogen project serves as a stark reminder of the complexities and uncertainties inherent in large-scale energy infrastructure. Success will hinge not only on technological prowess but also on effective policy alignment, robust project planning, and agile market responsiveness. Western leadership in this domain will require a concerted effort to bridge the gap between scientific achievement and industrial deployment, ensuring a sustainable and secure energy future.

- ◆ How can Western OEMs accelerate solid-state battery supply chain development to match Asian 2027 pilot production timelines?
- ◆ What specific policy mechanisms are needed to de-risk large-scale green hydrogen and LDES projects in the US/EU, preventing cancellations like HyScale 100?
- ◆ What immediate actions can Western material suppliers take to secure critical mineral access and scale novel material production to meet projected 2030 demand?

Troy Technical Weekly Editorial Team Editorial Assistant

Next Issue Vol. 50 Monday, August 24, 2026 06:00 JST Feature: AI's Impact on Material Science & Energy Efficiency