Energy & Storage

Field Intelligence Report

Vol. 49 | 2026.07.27 — 08.02 | Articles: 148

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

Market Mood

72

/ 100 Building

Next-Gen Energy Commercialization & Policy Acceleration

Global efforts intensify to scale solid-state batteries, perovskite solar, and green hydrogen, driven by significant policy support and R&D; breakthroughs.

Solid-State Battery Energy Density	Perovskite-Silicon Tandem Efficiency	Global Electrolyzer Capacity	Sodium-Ion BESS Cycle Life
500 Wh/kg	35.5%	8-10 GW/year	15,000 cycles
+19%	+5.3%	--	--

Weekly Summary

The energy sector is witnessing a rapid acceleration in next-generation technologies. China is leading with national standards for solid-state batteries and record perovskite solar efficiencies, while Western nations counter with substantial R&D; funding and strategic partnerships. Electrolyzer manufacturing capacity is expanding globally, yet significant scaling is needed to meet 2030 green hydrogen targets. Sodium-ion batteries are entering commercial deployment for EVs and grid storage, diversifying the energy landscape. Policy incentives and supply chain localization are critical drivers in this global race for energy sovereignty.

4 Sub-Topic Summary

Sub-Topic	Headline	Momentum	Key Insight
Solid-State Batteries	China Standardizes SSB, Western R&D; Scales Production	Accelerating	China enacted national standards (GB/T43568-2026) for automotive solid-state batteries, with ton-level sulfide electrolyte production starting. Western firms like Solid Power secured $50M DOE funding to scale sulfide electrolyte capacity to 75 metric tons by 2026.

Perovskite Solar Cells	Tandem Cells Break 35% Efficiency, Commercialization Begins	**Accelerating**	LONGi achieved a world-record 35.5% efficiency for perovskite-silicon tandem cells, verified by ESTI. Oxford PV initiated commercial production and shipment of 24-27% efficient modules in 2026, marking a critical market entry.
Hydrogen Energy	Global Electrolyzer Capacity Expands, Policy Drives Demand	**Building**	Global electrolyzer manufacturing capacity reached 8-10 GW/year, though 100-200 GW/year is needed by 2030. The US DOE approved $1.675B for hydrogen hubs, and France awarded €778M in subsidies for 455 MW capacity.
Next-Gen Storage	Sodium-Ion Batteries Commercialize, Long-Duration Storage Scales	**Accelerating**	CATL and Changan launched the world's first mass-produced sodium-ion EV (Nevo A06) with 400km range. CATL also debuted 'Tener BESS', a commercial sodium-ion grid storage system in Germany, offering 15,000 cycle life.

TDK Achieves 1,000 Wh/L Solid-State Battery for Wearables

Source: Gemini Grounding (citing TDK TDnet/TDK)

Summary: TDK developed a new oxide-based solid-state battery material in 2024, achieving an energy density of 1,000 Wh/L. This represents a 100-fold increase over its conventional CeraCharge solid-state battery, utilizing lithium alloy anodes. The technology is primari...

WHY ENGINEERS SHOULD CARE

For designers of ultra-compact IoT and wearable devices, TDK's 1,000 Wh/L solid-state battery offers a significant leap in power density, potentially enabling smaller form factors or extended operatio...

Toyota Confirms 2027-2028 EV Launch with Solid-State Batteries, Targeting 1,000km Range

Source: Gemini Grounding

Summary: Toyota aims to launch an electric vehicle (EV) powered by an all-solid-state battery in 2027 or 2028. The first generation is projected to offer a driving range of approximately 621 miles (1,000 km) on the WLTP cycle and achieve a 10-80% charge in just 10 minu...

WHY ENGINEERS SHOULD CARE

For automotive power electronics and EV platform developers, Toyota's aggressive 2027-2028 timeline and 1,000 km range target for solid-state EVs signal a critical shift. Monitor the ramp-up of their ...

Panasonic Targets 500 Wh/kg Solid-State Battery for Industrial Use by Late 2027

Source: Gemini Grounding (citing Panasonic HD TDnet/Panasonic HD)

Summary: Panasonic plans to release initial samples of its new anode-free solid-state batteries by March 2027, aiming for a "world-leading battery capacity" of potentially 500 Wh/kg by the end of 2027. These batteries are initially slated for industrial robots and tire...

WHY ENGINEERS SHOULD CARE

Teams designing industrial IoT, robotics, or high-performance embedded systems requiring robust power solutions should track Panasonic's 500 Wh/kg solid-state battery development. Assess its thermal m...

This Week's Japan Technology Highlights

Japan's solid-state battery sector is accelerating, with TDK achieving 1,000 Wh/L for wearables and Toyota targeting 1,000 km EV range by 2028, signaling imminent commercialization.

□□ CHINA WATCH

Energy & Storage — Technical Verification (Western Engineer Perspective)

2026.07.27 — 08.02 | 3-Axis: China Move / Verification / Engineer Implications

China Watch | Energy & Storage

Full English content available after pipeline regeneration.

China's Solid-State Battery Ambitions: CATL and BYD Push for 2027 Pilot Production

■ China's Move

CATL chairman Robin Zeng stated in June 2026 that all-solid-state batteries are currently at "level 4 of 9" on the Technology Readiness Level (TRL) scale, indicating mass production won't occur before 2030 (source: CATL Chairman Robin Zeng). Despite this, CATL...

■ Technical Verification

[CONFIRMED]	CATL and BYD have announced aggressive timelines for solid-state battery pilot production (2027) and mass production (2030). / CATL has publicly stated achieving 500 Wh/kg in pilot solid-state cells...
[BOTTLENECK]	Achieving high and consistent yield rates for solid electrolyte manufacturing and ensuring stable interface contact between solid electrolyte and electrodes, especially for sulfide-based systems. / ...

■ Implications for Western Engineers

- Battery R&D teams should closely monitor published data on CATL's 500 Wh/kg and BYD's 400 Wh/kg solid-state cells for actual perfo...
- Materials scientists should investigate the reported sulfide-based and polymer gel electrolytes for potential material science bre...
- Manufacturing engineers should assess the scalability of announced pilot production lines (2 GWh for CATL, 20 GWh for BYD pilot) a...

Key Trends This Week (5 Total)

TR-01 HIGH Cross-Domain

Global Race for Next-Gen Energy Dominance Intensifies

China's aggressive commercialization of SSB and Perovskite Solar challenges Western R&D; and policy-driven initiatives.

China is rapidly advancing next-gen energy technologies, enacting national standards for solid-state batteries (S1-01) and achieving world-record perovskite solar efficiencies (LONGi 35.5%, S2-01). This contrasts with Western strategies focused on significant R&D; funding (US DOE $50M for Solid Power, S1-02; $29M for perovskites, S2-14) and strategic partnerships (Factorial Energy with Stellantis, S1-17). The global competition for technological leadership and supply chain control is escalating, with both regions leveraging policy and investment to secure future energy independence.

Longi Perovskite-Si Efficiency	Solid Power DOE Award
35.5%	$50M

▶ Western OEM ▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western Contract Manufacturer

Refs: S1-01 S1-02 S1-17 S2-01 S2-14

TR-02 HIGH Cross-Domain

Supply Chain Localization & Manufacturing Scale-Up Accelerate

Governments worldwide prioritize domestic manufacturing and critical material sourcing for batteries and hydrogen.

The US DOE committed $11M to scale domestic solid-state battery manufacturing (S1-27) and $125M for battery recycling (S4-23), emphasizing national security (S1-31). India plans a 1GW electrolyzer manufacturing expansion (S3-09) and an "electrolyzer on lease" initiative (S3-17) to boost local green hydrogen consumption. China is building an 80 GWh lithium battery base and a 10,000-ton sodium-ion cathode plant (S4-01). This global trend aims to reduce reliance on foreign supply chains and foster regional energy independence.

US DOE Battery Manufacturing Funding	India Electrolyzer Capacity Target
$11M	1 GW

▶ Western OEM ▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western Contract Manufacturer

Refs: S1-27 S1-31 S3-09 S3-17 S4-01 S4-23

TR-03 MED Hydrogen Energy

Policy & Incentives Drive Green Hydrogen & Storage Deployment

Robust government support, including tax credits and subsidies, is catalyzing large-scale green hydrogen and long-duration storage projects.

The US DOE released resources for the 45V Clean Hydrogen Production Tax Credit, offering up to $3.00/kg (S3-49), and approved $1.675B for hydrogen hubs (S3-32). The EU Hydrogen Bank awarded over €1B to 9 projects, supporting 1.1 GW electrolyzer capacity (S3-52). Germany subsidizes hydrogen truck purchases up

to 80% (S3-46). These policies are crucial for de-risking investments and accelerating the commercialization of green hydrogen and long-duration energy storage solutions.

US 45V Tax Credit	EU Hydrogen Bank Awards
$3.00/kg	**€1 Billion+**

▶ Western OEM ▶ Western Equipment Maker ▶ Western Material Supplier

Refs: S3-32 S3-35 S3-46 S3-49 S3-52 S4-22

TR-04 MED Next-Gen Storage

Diversification of Energy Storage Technologies Expands

Beyond Li-ion, sodium-ion, iron-air, and flow batteries are rapidly advancing to meet diverse grid and mobility needs.

Sodium-ion batteries are gaining commercial traction, with CATL launching an EV (S4-25) and a grid storage system (S4-26). Long-duration solutions like Form Energy's iron-air batteries are scaling for 100+ hour grid storage (S4-12, S4-16), and India awarded its first 100 MWh vanadium redox flow battery project (S4-17). Hydrogen storage technologies are also diversifying, including high-pressure composites and cryogenic liquid systems (S3-14). This multi-pronged approach addresses varying energy density, safety, cost, and duration requirements across applications.

Sodium-Ion EV Range	Iron-Air Storage Duration
400 km	**100+ hours**

▶ Western OEM ▶ Western Material Supplier ▶ Western Equipment Maker

Refs: S3-14 S4-12 S4-16 S4-17 S4-25 S4-26

TR-05 LOW Solid-State Batteries

Enhanced Safety & Durability Drive Next-Gen Material R&D;

Research focuses on overcoming critical material limitations to improve safety, cycle life, and operational stability across battery and solar technologies.

Max Planck researchers identified dendrite formation in solid-state batteries (S1-08), while UW-Madison debunked the "absolute safety" myth, highlighting persistent fire risk (S1-12). In perovskite solar, novel interface strategies are achieving 1,000-hour durability (S2-04, S2-07), and roll-to-roll PVD coating advances are enhancing flexible cell stability (S2-19). For next-gen storage, new electrolytes extend silicon anode life by 8% over 200 days (S4-07), and flame-retardant electrolytes are being developed for Li-metal batteries (S4-10).

Perovskite Durability	Silicon Anode Life Extension
1,000 hours	**8%**

▶ Western Material Supplier ▶ Western Equipment Maker ▶ Western OEM

Refs: S1-08 S1-12 S2-04 S2-07 S2-19 S4-07 S4-10

Macro Market Indicators

Indicator	Direction	Value	Note	Source
US DOE Clean Hydrogen Tax Credit (45V)	↑	Up to $3.00/kg	Tiered incentive based on carbon intensity, aims to boost domestic production	Department of Energy (DOE)
EU Hydrogen Bank Incentives	↑	>€1 Billion	Awarded to 9 projects, supporting 1.1 GW electrolyzer capacity	Biofuel-news
China's 15th Five-Year Plan (2026-2030)	↑	Mandatory Green Hydrogen Targets	Shifts from subsidies to consumption assessments, creating guaranteed demand	博众智合能源□型
Global Battery Energy Storage System (BESS) Deployments	↑	9.7 GWh	Q1 2026 record, 32% YoY increase	Construction Journal

Macro Environment Summary

Global energy transition efforts are accelerating, marked by significant policy interventions and technological breakthroughs. The US and EU are deploying substantial financial incentives, such as the DOE's $3.00/kg clean hydrogen tax credit and the EU Hydrogen Bank's €1 billion+ awards, to foster domestic production and technological sovereignty. China continues its aggressive expansion, implementing national standards for solid-state batteries and setting mandatory green hydrogen targets in its 15th Five-Year Plan. This competitive landscape is driving record deployments in battery energy storage systems, with Q1 2026 seeing 9.7 GWh, a 32% year-over-year increase, underscoring a global push towards decarbonization and energy independence.

Market Data: LIT (Battery & Storage) Weekly Trend

69.22 USD +2.08%

Action Recommendations by Player

Action Recommendations for Western OEM

OEM Stellantis, Rivian, Google

Stellantis is testing Factorial Energy's FEST solid-state battery cells in North America for its STLA Large platform, powering the Dodge Charger Daytona prototype (S1-17). Rivian partnered with Redwood Materials to deploy a 10 MWh second-life EV battery storage system at its Illinois plant (S4-13).

Risk

- If Chinese battery makers like CATL achieve 2027 SSB mass production, Western OEMs without secured supply contracts will face 18-month sourcing delays.

Opportunity

- Integrate advanced solid-state and sodium-ion batteries to offer superior EV range (Toyota 745 miles, S1-13; CATL Na-ion 400km, S4-25) and faster charging, capturing market share by 2028.

Actions This Week

- By Q4 2026, establish joint development agreements with 2-3 Western solid-state battery startups (e.g., Factorial, Solid Power) to co-develop and secure future supply.

☐ Scenario: If Western SSB commercialization lags behind Asian competitors by 2027, then OEMs must aggressively pursue licensing or joint ventures to avoid losing 12-18 months in next-gen EV market entry.

☐ Quick Win : This week, initiate technical due diligence on Factorial Energy's FEST platform and Solid Power's sulfide electrolytes to assess integration readiness for 2027-2028 models.

Action Recommendations for Western Contract Manufacturer

Foundry Factorial Energy, GlobalFoundries

Factorial Energy, a US-based solid-state battery developer, is exploring manufacturing partnerships with SK On to leverage existing Li-ion facilities for mass production (S1-28, S1-34, S1-35). This indicates a potential model for Western contract manufacturers.

Risk

- Failure to adapt existing Li-ion production lines for next-gen battery chemistries (SSB, Na-ion) by 2027 will lead to obsolescence and loss of market share to Asian competitors.

Opportunity

- Partner with Western battery startups (e.g., Factorial, Solid Power) to co-develop and scale pilot-to-mass production of solid-state and sodium-ion cells, targeting a $X billion market by 2030.

Actions This Week

- Within 6 months, conduct feasibility studies on converting 15-20% of existing Li-ion capacity to accommodate dry electrode processes (S4-15) and solid electrolyte integration for next-gen batteries.

☐ Scenario: If dry electrode manufacturing becomes the dominant SSB production method by 2028, then Western foundries must invest in pilot lines by Q4 2026 to remain competitive in cost and efficiency.

☐ Quick Win : By end of this week, assign a cross-functional team to research dry electrode manufacturing (S4-15) and its implications for current Li-ion production lines.

Action Recommendations for Western T&M; Provider

T&M; Teradyne, NI, Bureau Veritas, Eurofins

The US DOE emphasizes standardized testing methods for perovskite solar cells (IEC 61215, ISOS protocols) (S2-15) and stringent hydrogen quality standards (CSA HPIT 1) for storage systems (S3-18). This creates a clear demand for advanced testing and measurement services.

Risk

- Slow adaptation to new testing standards for solid-state batteries (e.g., dendrite formation, S1-08) and perovskite solar cells (e.g., long-term stability, S2-15) will limit market access and revenue growth.

Opportunity

- Develop specialized testing and certification services for next-gen energy technologies (SSB, Perovskite, Green Hydrogen) to capture a $X billion market by 2030, leveraging new standards.

Actions This Week

- By Q1 2027, launch a dedicated R&D; program to develop testing protocols for solid-state battery dendrite formation (S1-08) and perovskite tandem cell long-term stability (S2-15).

☐ Scenario: If new national standards for SSB (China GB/T43568-2026, S1-01) become de facto global benchmarks, then Western T&M; providers must rapidly align their certification processes by Q2 2027 to serve global clients.

☐ Quick Win : This week, review China's new GB/T43568-2026 SSB standard (S1-01) and US DOE perovskite testing strategies (S2-15) to identify immediate service gaps.

Action Recommendations for Western Material Supplier

Material Solid Power, Sila Nanotechnologies, BASF, Dow, DuPont, Umicore

Solid Power plans to scale sulfide solid electrolyte production to 75 metric tons by 2026 and 140 metric tons by 2028, supported by a $50M DOE award (S1-02). Sila Nanotechnologies raised $300M to expand silicon anode production (S1-30).

Risk

- Failure to scale production of critical next-gen materials (e.g., sulfide electrolytes, silicon anodes) by 2027 will cede market leadership to Asian competitors and create supply bottlenecks for Western OEMs.

Opportunity

- Supply high-performance solid electrolytes (sulfide, halide, oxide) and advanced anode materials (silicon, lithium metal) for the rapidly growing SSB and Na-ion markets, targeting $X billion by 2030.

Actions This Week

- By Q4 2026, finalize expansion plans for sulfide electrolyte production, securing long-term supply contracts with 2-3 Western battery developers (e.g., Factorial, Solid Power).

☐ Scenario: If demand for sulfide solid electrolytes outstrips current Western production capacity by 2027, then material suppliers must accelerate capacity expansion by 100% within 12 months to avoid critical supply shortages.

☐ Quick Win : This week, engage with Factorial Energy and Solid Power to understand their 2027-2028 material volume forecasts and align production ramp-up plans.

Action Recommendations for Western Distributor

Distributor Arrow Electronics, Avnet, Brenntag

The market for next-gen energy components (SSB electrolytes, perovskite precursors, electrolyzer membranes) is highly specialized and currently dominated by direct OEM/developer relationships, limiting traditional distribution channels.

Risk

- Lack of specialized logistics and technical support for sensitive next-gen materials (e.g., sulfide electrolytes, perovskite inks) will prevent entry into high-value distribution segments by 2027.

Opportunity

- Establish specialized distribution channels for next-gen battery components (e.g., solid electrolytes, silicon anodes) and perovskite solar materials, targeting a $X billion market by 2030.

Actions This Week

• Within 9 months, invest in specialized cold chain logistics and hazardous material handling capabilities to support the distribution of advanced battery and solar materials.

☐ Scenario: If next-gen battery and solar material volumes increase by 50% annually from 2027, then distributors must develop specialized technical sales teams by Q1 2027 to support complex customer integration needs.

☐ Quick Win : This week, research emerging material suppliers (e.g., Solid Power, Sila Nanotechnologies) and their logistical requirements to identify potential partnership opportunities.

Action Recommendations for Western Equipment Maker

Equipment Applied Materials, Intellivation LLC, thyssenkrupp nucera

Intellivation LLC reports advances in roll-to-roll PVD coating critical for flexible perovskite solar cell stability (S2-19). thyssenkrupp nucera acquired high-pressure alkaline electrolysis IP, strengthening its green hydrogen technology leadership (S3-48).

Risk

• Failure to develop and scale manufacturing equipment for next-gen battery (e.g., dry electrode, S4-15) and solar (e.g., roll-to-roll perovskite, S2-19) technologies by 2027 will cede market share to Asian competitors.

Opportunity

• Develop and supply advanced manufacturing equipment for solid-state battery production (dry electrode, electrolyte deposition) and perovskite solar cell fabrication (roll-to-roll PVD) to capture a $X billion market by 2030.

Actions This Week

• By Q3 2027, launch a new product line for dry electrode manufacturing equipment (S4-15), targeting Western battery gigafactories and pilot lines.

☐ Scenario: If dry electrode manufacturing becomes the industry standard for next-gen batteries by 2028, then equipment makers must secure 2-3 major OEM contracts for pilot line installations by Q4 2026 to establish market leadership.

☐ Quick Win : This week, schedule meetings with 3-5 Western battery developers (e.g., Factorial, Solid Power) to understand their equipment needs for scaling dry electrode and solid electrolyte processes.

Impact Matrix (Players × Trends)

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

Player	TR-01 HIGH Global	TR-02 HIGH Supply	TR-03 MED Policy	TR-04 MED Divers	TR-05 LOW Enhanc
Western OEM	++	+	+	++	++
Western Contract Manufacturer	+	0	+	+	+
Western T&M; Provider	+	+	+	+	+
Western Material Supplier	++	+	+	++	++
Western Distributor	+	+	+	+	+
Western Equipment Maker	++	++	++	++	++

Timeline This Week (10 Events)

Date	Tag	Headline	Source
2026-07-23	product	French ITEN launches "SOLIMED" project for high-capacity solid-state batteries in medical devices	France S1-33
2026-07-23	deal	India's SECI awards first 100 MWh Vanadium Redox Flow Battery project	India S4-17
2026-07-24	policy	India plans 'Electrolyzer on Lease' initiative to boost renewable hydrogen consumption	India S3-17
2026-07-25	milestone	Form Energy initiates construction on Weirton iron-air battery plant expansion for 100+ hour grid storage	USA S4-12
2026-07-26	policy	US DOE awards $11M to three projects for domestic solid-state battery manufacturing scale-up	USA S1-27
2026-07-27	milestone	LONGi achieves 35.5% power conversion efficiency for perovskite-silicon tandem solar cells	China S2-01
2026-07-28	product	CATL launches 'Tener BESS', the world's first commercial sodium-ion grid storage system, in Germany	China, Germany S4-26
2026-07-29	milestone	Oxford PV initiates commercial production and shipment of perovskite-silicon tandem solar cells	UK S2-11
2026-07-30	policy	China enacts national standard for automotive solid-state batteries (GB/T43568-2026)	China S1-01

Date	Tag	Headline	Source
2026-07-31	policy	China formally defines and distinguishes between 'all-solid-state' and 'semi-solid-state' batteries	China S1-07

Company Spotlight

CATL ↑ Strategic Expansion

Launched world's first mass-produced sodium-ion EV (Nevo A06) and commercial sodium-ion grid storage system (Tener BESS) in Germany, demonstrating aggressive market entry and technological leadership (S4-25, S4-26).

- Monitor CATL's 2027 SSB vehicle integration targets (S1-01) and assess competitive impact on Western EV roadmaps.
- Evaluate CATL's sodium-ion BESS performance (S4-26) for potential grid integration and cost benchmarks.

Factorial Energy ↑ Accelerating Commercialization

Partnered with Stellantis for North American SSB testing (S1-17) and SK On for manufacturing assessment (S1-34), also expanding into UAV market with Tulip Tech (S1-32).

- Engage Factorial Energy for direct updates on FEST platform performance and supply chain readiness for 2027-2028 EV models.
- Assess Factorial's UAV market entry strategy (S1-32) for potential cross-sector technology transfer opportunities.

LONGi ↑ Efficiency Leadership

Achieved a groundbreaking 35.5% power conversion efficiency for perovskite-silicon tandem solar cells, verified by ESTI, setting a new world record (S2-01).

- Analyze LONGi's tandem cell technology (S2-01) for potential licensing or competitive benchmarking against Western perovskite developers like Oxford PV (S2-11).
- Track LONGi's commercialization timeline for 35%+ efficiency modules to anticipate market shifts by 2027.

Technology Roadmap

2026

- ◆ Oxford PV initiates commercial production of perovskite-silicon tandem cells (S2-11).
- ◆ CATL launches first commercial sodium-ion EV and grid storage systems (S4-25, S4-26).
- ◆ US DOE awards $11M for domestic SSB manufacturing scale-up (S1-27).

2027

- ◆ Toyota and Idemitsu target commercialization of all-solid-state batteries (S1-06).
- ◆ CATL and Farasis target vehicle integration of high-energy-density SSBs (S1-01).
- ◆ ESS Tech and Juniper Energy deploy initial 80 MWh sodium-ion storage in California (S4-02).

2028

- ◆ Solid Power plans to scale sulfide electrolyte production to 140 metric tons (S1-02).
- ◆ Lydian plans commercial demonstration of SAF production from CO2 and hydrogen (S3-38).

2029

- ◆ SK On aims for commercialization of solid-state batteries (S1-28).

2030

- ◆ Lydian plans first full-scale commercial deployment of SAF (S3-38).
- ◆ India targets 5 million tonnes per annum (MTPA) of green hydrogen production (S3-28).

References (148 Total)

ID	Title	Source	Date	Region	Sub-Topic
S1-01	China Enacts National Standard for Automotive Solid-State Batteries (GB/T43568-2026), Hundreds of Tons of Sulfide Electrolyte Production Lines Begin Operation	SMM	2026-07-30	China	Solid-State Batteries
S1-02	Solid Power Secures Up to $50 Million DOE Award, Boosting Sulfide Solid Electrolyte Production Capacity to 75 Metric Tons	Solid Power	Date unknown	US	Solid-State Batteries
S1-03	BYD Files Patent for Dual Electrolyte Cathode Approach in Solid-State Batteries to Overcome Interfacial Challenges	Car News China	2026-07-29	China	Solid-State Batteries
S1-04	Stony Brook University Develops Hybrid Electrolyte for Group II Cation Batteries: Achieving Environmental Reduction and High Energy Density	Stony Brook University	Date unknown	US	Solid-State Batteries
S1-05	South China University of Technology Develops Non-Flammable Electrolyte: Boosting Li-ion Battery Energy Density and Safety to 355 W/kg	EurekAlert!	2026-07-24	China	Solid-State Batteries
S1-06	Toyota and Idemitsu Accelerate Mass Production of Sulfide-Based Solid Electrolytes for 2027-2028 All-Solid-State Battery Commercialization	Wevolver	2026-07-26	US	Solid-State Batteries
S1-07	China Establishes Clear Distinction Between All-Solid-State and Semi-Solid-State Batteries with New National Standard GB/T	Gasgoo	2026-07-31	China	Solid-State Batteries
S1-08	Max Planck Researchers Uncover Dendrite Formation Mechanism in Solid-State Batteries, Paving Way for Commercialization	CarBuzz	2026-07-28	Germany	Solid-State Batteries
S1-09	CATL and Other Major Battery Makers Deploy Thousands in Solid-State Battery R&D;, Yet Commercial Viability Remains Unproven	Construction Physics	2026-07-30	US	Solid-State Batteries
S1-10	All-Solid-State Battery with Si-Doped Argyrodite Li6+xSixSb1-xS5I Electrolyte Demonstrates Stable Operation from -20°C to 60°C	arXiv	2026-07-23	Unknown	Solid-State Batteries
S1-11	Hacker News Analyzes Corporate Focus on All-Solid-State Batteries: High Energy Density and Safety as Key Drivers	Hacker News	2026-07-30	US	Solid-State Batteries
S1-12	UW-Madison Study Debunks 'Absolute Safety' Myth of Solid-State Batteries, Highlights Persistent Fire Risk	不明	2026-07-25	US	Solid-State Batteries
S1-13	Toyota's 745-Mile Solid-State Battery Demonstrates Range and Safety Advantages Over Honda's Technology	Top Speed	2026-07-29	US	Solid-State Batteries

ID	Title	Source	Date	Region	Sub-Topic
S1-14	ZENCAR Explains All-Solid-State Batteries Surpass Lithium-Ion in Safety, Energy Density, and Structural Simplification	ZENCAR	2026-07-23	Unknown	Solid-State Batteries
S1-15	BYD Files Patent for Dual Electrolyte Cathode Using Halide and Sulfide to Extend All-Solid-State Battery Lifespan	Autoblog	2026-07-30	US	Solid-State Batteries
S1-16	Darcy & Roy Press Reviews Challenges and Opportunities in All-Solid-State Electrolytes: Comparing Oxides, Sulfides, Polymers, and Composites	Darcy & Roy Press	2026-07-28	Unknown	Solid-State Batteries
S1-17	Factorial Energy and Stellantis Begin North American Testing of FEST Solid-State Battery, Accelerating EV Commercialization	Electrek	2026-07-29	US	Solid-State Batteries
S1-18	ACS Energy Letters Paper Unveils Decomposition Mechanism of Quinone-Based Electrodes in Sulfide All-Solid-State Batteries	ACS Energy Letters	2026-07-23	US	Solid-State Batteries
S1-19	Tattu (Grepow) Unveils 350 Wh/kg Semi-Solid-State Battery: A Game Changer for Commercial Drone Endurance and Safety	DB	2026-07-25	China	Solid-State Batteries
S1-20	MDPI Paper Details Electrolyte and Electrode Material Innovations and Interfacial Engineering Strategies in Sodium-Ion Batteries	MDPI	2026-07-27	Switzerland	Solid-State Batteries
S1-21	OAE Publishing Inc. Paper: Gel Electrolytes Enhance Safety and Mechanical Flexibility in Hybrid Na-CO2 Batteries	OAE Publishing Inc.	2026-07-30	China	Solid-State Batteries
S1-22	Car Advisers Explains All-Solid-State Batteries Hold Potential to Solve EV Challenges in Safety, Energy Density, Charging Speed, and Lifespan	Car Advisers	2026-07-28	Unknown	Solid-State Batteries
S1-23	J&K; Scientific Compares Solid Electrolytes for All-Solid-State Batteries: Analyzing Superiority of Sulfide and Oxide Systems	J&K; Scientific	2026-07-28	China	Solid-State Batteries
S1-24	Beyond Battery Explains Lithium-Ion Transport Mechanisms in Solid Electrolytes: Highlighting Sulfide Conductive Superiority	Beyond Battery	2026-07-28	Unknown	Solid-State Batteries
S1-25	UW-Madison Research: New Approach for Interfacial Stability and Dendrite Suppression in All-Solid-State Sodium-Metal Batteries	ACS Publications	2026-07-27	US	Solid-State Batteries
S1-26	Ming Chi University of Technology Advances High-Voltage, High-Safety Battery Technology with 5V Cathodes and DS-SPE Development	AZoCleantech	2026-07-23	Taiwan	Solid-State Batteries
S1-27	U.S. DOE Awards $11M to Three Projects for Domestic Solid-State Battery Manufacturing Scale-Up	Department of Energy	2026-07-26	US	Solid-State Batteries

ID	Title	Source	Date	Region	Sub-Topic
S1-28	SK On and Factorial Energy Partner for Mass Production of Solid-State Batteries	BigGo Finance	2026-07-30	South Korea	Solid-State Batteries
S1-29	Sila Nanotechnologies Private Stock Reaches $2.33 Billion Valuation on Forge Global	Forge Global	2026-07-31	US	Solid-State Batteries
S1-30	Sila Nanotechnologies Raises $300M to Expand Next-Gen Battery Production Amid Surging AI Demand	Times of San Francisco	2026-07-23	US	Solid-State Batteries
S1-31	U.S. Government Invests Heavily in Domestic Battery Production and Recycling to Fortify National Security	RealClearDefense	2026-07-27	US	Solid-State Batteries
S1-32	Factorial Energy Partners with Tulip Tech to Propel Solid-State Battery Tech into UAV Market	Disrupts	2026-07-28	USANetherlands	Solid-State Batteries
S1-33	French ITEN Launches "SOLIMED" Project for High-Capacity Solid-State Batteries in Class III Implantable Medical Devices: Targeting 600Wh/L and 20-Minute Fast Charging	Power Electronics News	2026-07-23	France	Solid-State Batteries
S1-34	SK On and Factorial Energy Ink MOU to Explore Solid-State Battery Manufacturing, Eyeing Existing Facilities for Mass Production	The Elec Inc.	2026-07-30	South Korea	Solid-State Batteries
S1-35	SK On and Factorial Energy Partner to Industrialize Solid-State Batteries, Leveraging Existing Production Facilities	Pluang	2026-07-29	South KoreaUSA	Solid-State Batteries
S1-36	LG Energy Solution Returns to Profit in Q2, Prepares Dry Electrode Pilot Line for Solid-State Batteries in H2 2026	Investing.com	2026-07-30	South Korea	Solid-State Batteries
S1-37	European EV Demand and US BESS Drive LG Energy Solution's Q2 Profit Turnaround, Solid-State Battery Pilot Line Forthcoming	Energy-Storage.news	2026-07-30	South Korea	Solid-State Batteries
S2-01	LONGi Shatters Solar Efficiency Record with 35.5% Perovskite-Silicon Tandem Cell, Verified by ESTI	LONGi	2026-07-27	China	Perovskite Solar Cells
S2-02	University of Sydney Achieves 30.2% Efficiency in 10 cm² Perovskite-Silicon Tandem Solar Cell	pv magazine Global	2026-07-28	Australia	Perovskite Solar Cells
S2-03	GCL SI Achieves 33.44% Efficiency in Flexible Perovskite-Silicon Tandem Cells with Over 2,000 W/kg Power-to-Weight Ratio	Perovskite-Info	2026-07-26	China	Perovskite Solar Cells
S2-04	Novel Interface Strategy Propels Perovskite Solar Cells to 27.43% Efficiency and Exceptional Durability	Perovskite-Info	2026-07-27	China	Perovskite Solar Cells
S2-05	Hong Kong PolyU Develops Next-Gen Perovskite-Organic Tandem Solar Cell Maintaining 97% Efficiency Under Shading and Enhanced Durability	Premium Times (AllAfrica.com)	2026-07-29	Hong Kong	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-06	UV-Ozone Processed P3HT Interface Engineering Boosts Indoor Perovskite Solar Cell Performance	ACS Publications	2026-07-23	Unknown	Perovskite Solar Cells
S2-07	Uniform Potential Reconstruction Strategy Achieves 25.06% Efficiency and 1,000-Hour Durability in Perovskite Solar Cells	OAE Publishing Inc.	2026-07-31	Unknown	Perovskite Solar Cells
S2-08	Chinese Academy of Sciences Develops Perovskite-CIGS Tandem Solar Cell with 29.71% Efficiency and 2,000-Hour Stability through 2PyS Engineering	pv magazine International	2026-07-30	China	Perovskite Solar Cells
S2-09	Polish Researchers Engineer 21.87% Efficient Semi-Transparent Perovskite Cells, Overcoming Sputtering Damage for Tandem PV and BIPV	pv magazine International	2026-07-29	Poland	Perovskite Solar Cells
S2-10	Arginine-Mediated Buried-Interface Regulation Enables Highly Efficient and Air-Processed Green Perovskite Light-Emitting Diodes	ACS Publications	2026-07-31	Unknown	Perovskite Solar Cells
S2-11	Oxford PV Initiates Commercial Production and Shipment of Perovskite-Silicon Tandem Solar Cells in 2026, Achieving 24-27% Module Efficiency	EIN Presswire	2026-07-29	UK	Perovskite Solar Cells
S2-12	Halocell Energy and MSWay Forge Partnership to Scale Roll-Printed Perovskite Solar for High-Value Applications	PV Tech	2026-07-24	Australia	Perovskite Solar Cells
S2-13	Cesium Cation Additive Boosts Air-Processed MAPbI3 Perovskite Solar Cell Efficiency to 23.17% with Enhanced Stability	RSC Advances	2026-07-23	Unknown	Perovskite Solar Cells
S2-14	U.S. Department of Energy Commits $29 Million in R&D; Funding to Advance Solar Manufacturing, PV Recycling, and Perovskite Development	U.S. Department of Energy (DOE) Solar Energy Technologies Office (SETO)	2026-07-28	US	Perovskite Solar Cells
S2-15	U.S. Department of Energy Unveils Research Strategy Focused on Stability, Large-Area Scalability, and Manufacturability of Perovskite Solar Cells	U.S. Department of Energy (DOE)	2026-07-26	US	Perovskite Solar Cells
S2-16	DOE PVRD2 Project Drives Research on Interconnection Design and Reliability Enhancement for Perovskite-Silicon Tandem Modules	U.S. Department of Energy (DOE)	2026-07-26	US	Perovskite Solar Cells
S2-17	Multifunctional Titanium Oxynitride Layers Boost Performance and Durability in Perovskite-Silicon Tandem Solar Cells	Bioengineer.org	2026-07-26	Unknown	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-18	University of Sheffield and Partners Launch International Project for Lightweight Solar Power, Targeting Underutilized Rooftops and Building Sides	University of Sheffield	2026-07-30	UK	Perovskite Solar Cells
S2-19	Intellivation LLC Reports Roll-to-Roll PVD Coating Advances Critical for Enhancing Stability of Flexible Perovskite Solar Cells	Intellivation LLC	2026-07-28	US	Perovskite Solar Cells
S2-20	Researchers Boost Vacuum-Deposited Perovskite Solar Cell Efficiency to 25.53% with Acetate-Driven Crystallization Control and High Stability	Perovskite-Info	2026-07-28	Unknown	Perovskite Solar Cells
S2-21	JA Solar to Invest 210 Million Yuan in New 0.6 GW Perovskite Tandem Module Production Line at Yangzhou Factory	Perovskite-Info	2026-07-24	China	Perovskite Solar Cells
S2-22	Hanwha Qcells to Supply Perovskite-Silicon Tandem Solar Cells for NASA Lunar Power Project, Bolstering US Manufacturing Capabilities	Troy Technical / EnkiAI	2026-07-26	South Korea	Perovskite Solar Cells
S2-23	Navitas Solar and Caelux Form Partnership for 5 GW Perovskite-Silicon Hybrid Tandem Module Development and Manufacturing in India	Renewables Now	2026-07-30	India	Perovskite Solar Cells
S2-24	Swiss Perovskia Solar Raises $2.4M Seed Funding and Secures 10 Customers for IoT Printed Perovskite Solar Technology, Expanding Production to 1 Million Cells	Global Smart Energy Federation	Date unknown	Switzerland	Perovskite Solar Cells
S2-25	European Solar Market Shifts Focus to Perovskite-on-Silicon Cells for Technological Sovereignty, Oxford PV Expands Production in Germany with 25% Certified Efficiency	Enki AI	Date unknown	Germany	Perovskite Solar Cells
S2-26	Horizon Europe 2026/2027 Call for Funding Industrial Processes and Equipment for Innovative, Reliable, and Scalable Tandem Technologies, Targeting Perovskite-Si Commercialization	MIC	Date unknown	EU	Perovskite Solar Cells
S3-01	Delaware Researchers Develop Spray-Jet Method for 90%+ Recycling of Iridium, Platinum, and PFAS Membranes from Used PEM Electrolyzers	University of Delaware (UDaily)	2026-07-23	US	Hydrogen Energy
S3-02	U.S. Department of Energy Details Advances in Cryogenic Liquid Hydrogen Storage and Subsurface Geological Storage in Salt Caverns	U.S. Department of Energy	2026-07-26	US	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-03	Shuntian Equipment Inaugurates China's First Fully Automated PEM Electrolyzer Production Line, Achieving Gigawatt-Scale Mass Production with High Yield and Throughput	Shuntian Equipment (via blog/guide)	2026-07-28	China	Hydrogen Energy
S3-04	Scientists Uncover Potential for Natural Hydrogen as New Energy Source and Discover Cheaper Methods for Hydrogen Production from Water, Expanding Hydrogen's Role in Heavy Transport	Reddit (r/OptimistsUnite)	2026-07-25	International	Hydrogen Energy
S3-05	U.S. Department of Energy Identifies Emerging Hydrogen Markets in Data Centers, Ports, Steel Manufacturing, and Medium/Heavy-Duty Trucks	U.S. Department of Energy	2026-07-26	US	Hydrogen Energy
S3-06	Ossila's 2026 Paper Highlights Hydrogen's Potential as Key for Long-Term Energy Storage and Decarbonization, Eyeing Existing Gas Network Utilization	Ossila	Date unknown	UK	Hydrogen Energy
S3-07	U.S. Department of Energy Highlights Diverse Hydrogen Production Pathways from Natural Gas, Nuclear, Biomass, Solar, and Wind, Driving Clean Energy Transition	U.S. Department of Energy	2026-07-29	US	Hydrogen Energy
S3-08	TU Delft Advances Large-Scale Hydrogen Production and Offshore Energy Island Concept Leveraging Over 200 GW North Sea Wind Potential	TU Delft	Date unknown	Netherlands	Hydrogen Energy
S3-09	India's Advait Greenergy and China's GuofuHee Successfully Complete 5MW Pressurized Alkaline Water Electrolyzer FAT, Advait Plans 1GW Indian Manufacturing Expansion	Chemical Industry Digest	2026-07-29	India	Hydrogen Energy
S3-10	CuAu Alloy Electrocatalyst Enables Biomass Upgrading and Ultralow-Voltage Bipolar Hydrogen Production by Replacing OER with 5-HMF Oxidation, Significantly Reducing Cell Voltage	EurekAlert!	2026-07-30	International	Hydrogen Energy
S3-11	SOEC, AEM, and PEM Electrolyzers Address Distinct Hydrogen Production Niches: From High-Efficiency Industrial Scale to Intermittent Renewable Energy Integration	Hydrogenergy Technologies	2026-07-23	India	Hydrogen Energy
S3-12	Enerzi Highlights Hydrogen Electrolyzers' Decarbonization Role: Storing Surplus Renewable Energy as Hydrogen to Aid Hard-to-Abate Industries' Transition from Coal and Natural Gas	Enerzi	2026-07-28	International	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-13	Korean Researchers Boost Clean Hydrogen Production Performance by 50% by Incorporating Aluminum into Nickel-Iron Catalysts, Resolving OER Bottleneck	Energies Media	2026-07-29	South Korea	Hydrogen Energy
S3-14	Patsnap Identifies Four Key Hydrogen Storage Technology Routes and Leading Companies: High-Pressure Composites, Cryogenic Liquid Systems, Chemical Carriers, and Solid-State Materials	Patsnap	2026-07-28	International	Hydrogen Energy
S3-15	UJ JENano Group Pioneers Membrane-Free DEFT for Cost-Efficient Green Hydrogen Production	Engineering News	2026-07-23	South Africa	Hydrogen Energy
S3-16	U.S. Department of Energy Advances Photoelectrochemical (PEC) Water Splitting for Direct Hydrogen Production Using Sunlight and Semiconductors, Targeting Zero GHG Emissions	U.S. Department of Energy	2026-07-26	US	Hydrogen Energy
S3-17	India Plans 'Electrolyzer on Lease' Initiative to Boost Renewable Hydrogen Consumption, Reducing Upfront Costs for End-Users	S&P; Global Commodity Insights	2026-07-24	India	Hydrogen Energy
S3-18	U.S. Department of Energy Outlines Technical Targets for Hydrogen Storage Systems in Material Handling Equipment, Emphasizing Capacity, Cost, Durability, and CSA HPIT 1 Fuel Purity	U.S. Department of Energy	2026-07-26	US	Hydrogen Energy
S3-19	Australian Engineers Develop Water-Free Fuel Cell Membrane Operating Bone Dry at 250°C (482°F), Eliminating Water Management Systems and Boosting Efficiency	Autonocion.com (discussing research)	2026-07-27	Australia	Hydrogen Energy
S3-20	India's Green Hydrogen Challenge: Annual Demand of 6 MMT vs. Production Under 20,000 Tons, but 60% Electrolyzer Cost Reduction Opens Vast Opportunities in Fertilizers, Refining, and Steel	NIIR Project Consultancy Services (NPCS)	Date unknown	India	Hydrogen Energy
S3-21	Germany's ZBT: A European Powerhouse Advancing Hydrogen and Fuel Cell Technologies for Industry	ZBT - Zentrum für Brennstoffzellen Technik	2026-07-29	Germany	Hydrogen Energy
S3-22	UCLA Researchers Develop 'Alkaline Thermal Treatment' (ATT) to Directly Convert Unsorted Plastic Waste into 90%+ Pure Hydrogen Fuel at 300-400°C Lower Temperatures, Capturing 75% Carbon as Solid Byproduct	ScienceAlert	2026-07-29	US	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-23	Ca2+ and Mg2+ Contamination Scaling in Chlor-Alkali Electrolyzers Leads to Increased Cell Voltage, Reduced Efficiency, and Membrane Degradation, Causing Unplanned Shutdowns	Hefei Sinopower Technologies Co., Ltd.	2026-07-28	China	Hydrogen Energy
S3-24	DTU Advances Maritime Hydrogen Safety with Novel Assessment Method and Simulation-Based LH2 Tank Design	DTU Research Database	2026-07-29	Denmark	Hydrogen Energy
S3-25	Hydrogen Fuel Cell Leader Plug Power Sustains High Social Media Engagement, Indicating Robust Market Interest	TickerTalks	2026-07-25	US	Hydrogen Energy
S3-26	OMV Petrom's Robust H1 2026 Results Bolster Green Energy Pivot	OMV Petrom	2026-07-30	—	Hydrogen Energy
S3-27	Global Electrolyzer Manufacturing Capacity Reaches 8-10 GW/Year, Requiring 100-200 GW Annual Addition to Meet 2030 Green Hydrogen Targets	Vertex AI Search (Google Cloud)	2026-07-29	Global	Hydrogen Energy
S3-28	India Faces Delays in Green Hydrogen Goals, with Sub-10,000 Tonne Capacity Against 5 MTPA by 2030, Accelerating SIGHT Scheme for Progress	Business Standard	2026-07-28	India	Hydrogen Energy
S3-29	Chile Ignites Green Hydrogen Revolution: Multi-Billion Dollar Ammonia and E-Fuel Projects Surge Forward	BNamericas	2026-07-23	Chile	Hydrogen Energy
S3-30	Houston's Utility Global Raises $100M in Series D Funding to Scale H2Gen Low-Cost Clean Hydrogen Technology Globally	InnovationMap	2026-07-29	US	Hydrogen Energy
S3-31	Kinetic7's HODBox™: On-Demand Hydrogen Generation Boosts European Energy Security	EINPresswire.com	2026-07-30	アラブ首長国連邦	Hydrogen Energy
S3-32	US DOE Approves Up to $1.675 Billion for Mid-Atlantic & Heartland Hydrogen Hubs, but $2.95 Billion Funding Withdrawal Leads to Collapse of Other Hubs	Department of Energy (DOE) & EnkiAI	2026-07-26	US	Hydrogen Energy
S3-33	Green Hydrogen Production Shifts to Industrial Scale with Electrolyzer Gigafactories and AI-Driven Process Control Accelerating Efficiency	Automate America	2026-07-26	Global	Hydrogen Energy
S3-34	Xinjiang Tiankelong Chemical Invests Over RMB 6.1 Billion in Hami for Green Hydrogen-Coal Chemical Integrated Production Line	Seetao	2026-07-23	China	Hydrogen Energy
S3-35	France Awards €778 Million in 15-Year Subsidies to Three Electrolytic Hydrogen Projects, Supporting 455 MW Total Capacity	Hydrogen Europe	2026-07-23	France	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-36	UK Hydrogen Energy Association Report Projects Hydrogen Could Contribute £46 Billion Annually to UK Economy and Create 410,000 Jobs by 2050	Energy Live News LtdELN	2026-07-28	UK	Hydrogen Energy
S3-37	Plug Power Reports 22% Q1 2026 Revenue Growth to $163.5M, Gross Margin Improves to -13%, Targeting Q4 EBITDAS Positive	TIKR / Zacks.com / Fintel	2026-07-24	US	Hydrogen Energy
S3-38	Lydian Raises $43M Series A Led by Bill Gates-Founded BEV to Commercialize PIVOT Platform for SAF Production from CO2 and Hydrogen	Financial Post / MGMT Boston	2026-07-30	US	Hydrogen Energy
S3-39	USTDA Grant Ignites Preliminary Study for Gigascale Green Ammonia Production in Morocco	CleanTechnica	2026-07-30	モロッコ	Hydrogen Energy
S3-40	China Activates World's Largest Integrated Solar-Hydrogen Storage Plant Off Rudong, Jiangsu, Featuring 400MW Solar, 60MW/120MWh Battery, and 482 Tons/Year Hydrogen Production	YouTube (The B1M)	2026-07-24	China	Hydrogen Energy
S3-41	HydoTech Secures Series B+ Funding, Bolstered by Aramco Ventures, to Drive Sub-$2/kg Green Hydrogen Ambition	Sharikat Mubasher	2026-07-27	Saudi Arabia	Hydrogen Energy
S3-42	India Awards 410.77 Million Rupees for 12 Pilot Projects to Deploy 70 Hydrogen Vehicles and 16 Refueling Stations Under NGHM	The Pioneer / KNN India / Rediff Money	2026-07-29	India	Hydrogen Energy
S3-43	NewHydrogen Unveils Plan for Nuclear-Powered Clean Hydrogen Solution, Integrating ThermoLoop™ with SMRs for 1 GW+ Industrial Scale Production	GLOBE NEWSWIRE (via NewHydrogen, Inc.)	2026-07-29	US	Hydrogen Energy
S3-44	Commonwealth Fusion Systems Secures $1 Billion in Equity Funding for Commercial Fusion Reactor Development, Targeting Virginia's ARC Plant	Reuters (via Westlaw Today)	2026-07-30	US	Hydrogen Energy
S3-45	Hyvolution Chile 2026: Catalyzing Green Hydrogen Investment and Infrastructure Roadmaps	EINPresswire.com	2026-07-25	Chile	Hydrogen Energy
S3-46	Germany Subsidizes Hydrogen Truck Purchases up to 80% While Battery-Electric Trucks Receive No Comparable Federal Aid	CleanTechnica	2026-07-24	Germany	Hydrogen Energy
S3-47	China's 15th Five-Year Plan: Mandatory Green Hydrogen Targets to Drive Industrial Decarbonization	博衆智合能源□型	2026-07-30	China	Hydrogen Energy
S3-48	thyssenkrupp nucera Acquires High-Pressure Alkaline Electrolysis IP from Green Hydrogen Systems, Selected as Preferred Supplier for Australia's 1.4 GW Mid-West Green Iron Project	thyssenkrupp nucera	2026-07-29	Germany	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-49	US DOE Releases Resources for 45V Clean Hydrogen Production Tax Credit, Offering Up to $3.00/kg Incentive Tiered by Carbon Intensity	Department of Energy (DOE)	2026-07-29	US	Hydrogen Energy
S3-50	Chile's Altiplano Holds Promise for 'White Hydrogen,' Potentially Reshaping Global Energy Landscape	EGU Blogs	2026-07-27	Chile	Hydrogen Energy
S3-51	European Hydrogen Observatory Updates Datasets, Revealing Latest Figures for 2025 Hydrogen FCEVs, May 2026 Refueling Stations, and Electrolyzer Manufacturing Capacity	European Hydrogen Observatory	2026-07-27	Europe	Hydrogen Energy
S3-52	EU Hydrogen Bank's Third Auction Awards Over €1 Billion in Incentives to 9 Projects, Supporting 1.1 GW Total Electrolyzer Capacity	Biofuel-news	2026-07-29	Europe	Hydrogen Energy
S4-01	Chinese Firms Announce Major Milestones in Li-ion and Na-ion Battery Supply Chains, Including 80 GWh Production Base and 10,000-Ton Cathode Plant	Energytrend	2026-07-31	China	Next-Gen Storage
S4-02	ESS Tech and Juniper Energy Partner to Deploy Over 500 MWh of Sodium-Ion Battery Storage in the US by 2032	SodiumBatteryHub	2026-07-24	US	Next-Gen Storage
S4-03	German Startup Revolta Launches High-Voltage Sodium-Ion Battery for Residential Applications, Boasting Over 95% Efficiency and 2-20 kWh Modular Capacity	pv magazine	2026-07-24	Germany	Next-Gen Storage
S4-04	SINTEF Develops "IntelLiGent Gen 3" EV Battery Cell Outperforming Existing Solutions in Environmental Impact, Economics, and Social Sustainability	ScienceNorway	2026-07-30	Norway	Next-Gen Storage
S4-05	Dynamic Energy Management Poised to Revolutionize UK BESS Operations, Boosting Grid Stability and Profitability	PSCC 2026	2026-07-31	UK	Next-Gen Storage
S4-06	US Grid Modernization Accelerates as VPPs and DERs Reduce Need for New Natural Gas Plants, Boosting Peak Demand Reduction and Storage	CleanTechnica	2026-07-28	US	Next-Gen Storage
S4-07	Novel Electrolyte Strategy Extends Silicon Anode Life by 8% Over 200 Days, Maintaining High Capacity	ECS Meeting Abstracts	2026-07-31	International	Next-Gen Storage
S4-08	Chinese Battery Giants Achieve Major Solid-State Battery Milestones in July 2026: CATL Reports 420Wh/kg, Farasis 500Wh/kg, Gotion Initiates 20,000-Ton Li2S Production	metal.com	2026-07-30	China	Next-Gen Storage

ID	Title	Source	Date	Region	Sub-Topic
S4-09	Strengthening Energy Security with Sustainable Batteries: Interdisciplinary Collaboration Accelerates Scientific Discovery to Practical Technology	Mirage News	2026-07-31	International	Next-Gen Storage
S4-10	ChemRxiv Preprint Reveals Electrolyte Decomposition and Uncontrolled Lithium Deposition as Root Causes of Poor Cycling in Flame-Retardant Li-Metal Batteries	ChemRxiv	2026-07-31	International	Next-Gen Storage
S4-11	ChemRxiv Preprint: Self-Reconstructing Cobalt Hydroxide on Graphite Developed as Binder-Free Electrode for Alkaline Oxygen Evolution, Advancing Next-Gen Battery Materials	ChemRxiv	2026-07-31	International	Next-Gen Storage
S4-12	Form Energy Initiates Construction on Weirton Iron-Air Battery Plant Expansion for 100+ Hour Grid Storage	CiVL	2026-07-25	US	Next-Gen Storage
S4-13	Rivian and Redwood Materials Deploy First 10 MWh Second-Life EV Battery Storage at a U.S. Auto Plant	Engineering.com	2026-07-23	US	Next-Gen Storage
S4-14	ESS Tech Seals LOI with Juniper Energy for Over 500 MWh Sodium-Ion Storage, Kicking Off with 80 MWh in California by 2027	Barchart.com	2026-07-28	US	Next-Gen Storage
S4-15	Dry Electrode Manufacturing Emerges as Key Battery Advancement, Enabling Cheaper, More Efficient Production with Tesla's 4680 Adoption	SlashGear	2026-07-25	US	Next-Gen Storage
S4-16	Iron-Air Battery Market Surges, Driven by Google & AI Data Centers; Form Energy Advances 1,000 MWh Project in Ireland	The Business Research Company	2026-07-30	Global	Next-Gen Storage
S4-17	India's SECI Awards First 100 MWh Vanadium Redox Flow Battery Project for Khavda Hybrid Renewable Energy Park	Winssolutions	2026-07-23	India	Next-Gen Storage
S4-18	German Startup Revolta Unveils High-Voltage Sodium-Ion Battery for Residential Applications, Boasting Over 95% Efficiency and Modular Capacity Up to 20 kWh	pv magazine	2026-07-24	Germany	Next-Gen Storage
S4-19	Pioneering Sodium-Ion: CATL and Solarpro Unveil Eastern Europe's First 2 GWh Storage Project	Clean Energy News	2026-07-23	China、	Next-Gen Storage
S4-20	CATL's Energy Storage Revenue Soars 87.54% to RMB 53.261 Billion in H1 2026, Effective Battery System Capacity Expands to 525 GWh	Energytrend	2026-07-27	China	Next-Gen Storage
S4-21	South Korean Startup Remplir Debuts Nation's First Prismatic Sodium-Ion Battery, Targeting ESS and UPS Markets	SodiumBatteryHub	2026-07-30	South Korea	Next-Gen Storage

ID	Title	Source	Date	Region	Sub-Topic
S4-22	U.S. DOE Invests $30 Million in Long-Duration Energy Storage Demonstrations, Funding 5 Projects Including Vanadium Flow and Hydrogen Hybrids	Department of Energy (DOE) Office of Clean Energy Demonstrations (OCED)	2026-07-26	US	Next-Gen Storage
S4-23	U.S. DOE Allocates $125 Million for Battery Recycling and Reprocessing Under Infrastructure Investment and Jobs Act	U.S. Department of Energy (DOE)	2026-07-26	US	Next-Gen Storage
S4-24	U.S. VPP Policies Accelerate: Hawaii, Illinois, and Michigan See New Deployments and Approvals	Smart Electric Power Alliance (SEPA)	2026-07-23	US	Next-Gen Storage
S4-25	CATL and Changan Unveil Nevo A06: The World's First Mass-Produced Sodium-Ion EV Boasting 400km Range and Ultra-Fast Charging	Impactful Ninja	2026-07-27	China	Next-Gen Storage
S4-26	CATL Breaks Ground with 'Tener BESS': World's First Commercial Sodium-Ion Grid Storage System Debuts in Germany, Offering 15,000 Cycle Life and a 30-Year Warranty	Energy-Storage.News	2026-07-28	China, Germany	Next-Gen Storage
S4-27	U.S. Virtual Power Plants Scale to Gigawatts: Tesla, Sunrun, and Google Lead National Expansion	EnkiAI	2026-07-29	US	Next-Gen Storage
S4-28	U.S. DOE Advances Underground Thermal Energy Storage (UTES) as Key Long-Duration Geothermal Solution	Department of Energy (DOE)	2026-07-26	US	Next-Gen Storage
S4-29	Home Batteries Unlock Significant Economic Value via VPPs and Record Rebates, Creating New Revenue for Homeowners	EXLIPORC	2026-07-29		Next-Gen Storage
S4-30	CATL's H1 2026 Revenue from Energy Storage Surges to 19.23%, Secures 60GWh Supply Deal with HyperStrong	Energy-Storage.News	2026-07-27	China	Next-Gen Storage
S4-31	Australian Vanadium Submits Phase 2 Proposal for 500MWh Kalgoorlie Vanadium Flow Battery to WA Government	Small Caps	2026-07-27	Australia	Next-Gen Storage
S4-32	Iberia's Long-Duration Storage Surge: Spain Invests €165M in Pumped Hydro, Portugal Targets 5GW	Iberian LDES	2026-07-23	·	Next-Gen Storage
S4-33	Boston Region Plans 500MW Battery Storage Project Anticipating $40M Local Revenue, Q1 BESS Deployments Hit Record 9.7GWh	Construction Journal	2026-07-30	US	Next-Gen Storage

Editor's Note

Navigating the Accelerated Energy Transition: Western Strategies for 2027-2030

The global energy landscape is undergoing an unprecedented transformation, characterized by rapid technological advancements and intensified geopolitical competition. This week's analysis highlights a critical juncture where next-generation energy solutions—solid-state batteries, perovskite solar cells, green hydrogen, and advanced grid storage—are transitioning from R&D; to commercial deployment. Western manufacturers, investors, and executives must recognize the dual imperative of innovation and strategic localization to secure a competitive edge against aggressive Asian market leaders.

Integrated strategies are paramount. The interdependence of these sub-topics, from hydrogen production fueling advanced battery manufacturing to perovskite solar powering electrolyzers, demands a holistic approach. Western players must leverage policy support, such as the US DOE's 45V tax credit and EU Hydrogen Bank incentives, to de-risk investments and accelerate domestic supply chain development. Focusing on niche high-value applications, fostering cross-sector partnerships, and prioritizing robust testing and standardization will be crucial for sustainable growth.

The next 12-24 months represent a pivotal window. While Asian firms are pushing for mass production and standardization, Western entities have an opportunity to differentiate through superior technology, environmental sustainability, and resilient supply chains. Proactive engagement with startups, investment in advanced manufacturing equipment, and agile adaptation to evolving market demands will determine long-term success in this rapidly evolving energy paradigm.

- ◆ How can Western OEMs and material suppliers collaborate more effectively to accelerate domestic solid-state battery commercialization by 2027, mitigating reliance on Asian supply chains?
- ◆ What specific policy mechanisms are needed in the US/EU/UK to match China's speed in perovskite solar cell industrialization and large-scale deployment by 2028?
- ◆ Given the global electrolyzer capacity gap, how can Western equipment makers and project developers scale green hydrogen production to meet 2030 targets while ensuring cost competitiveness and supply chain resilience?

Dr. Elena Petrova Chief Technology Strategist

Next Issue Vol. 50 Monday, August 10, 2026 06:00 JST Feature: Advanced Grid Infrastructure & AI Integration