

Energy & Storage

Field Intelligence Report

Vol. 48 | 2026.05.25 — 05.31 | Articles: 85

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

Market Mood

70

/ 100 Cautiously Optimistic

Energy Transition Accelerates: Asia Leads Commercialization, West Focuses on R&D; & Infrastructure

Advanced battery and hydrogen technologies see rapid deployment in Asia, while Western nations prioritize foundational R&D;, infrastructure build-out, and strategic supply chain resilience.

Solid-State Battery Energy Density 500 New high	Perovskite Solar Cell Efficiency 33 New record	Green Hydrogen Project Capacity 30 FID reached	Utility-Scale BESS Capacity 4.6 Record financing
--	---	---	---

Weekly Summary

The energy storage and hydrogen sectors are experiencing accelerated development, with Asian players like CATL and Chinese research institutions achieving significant commercialization milestones in solid-state batteries and perovskite solar cells. Western efforts, exemplified by DOE initiatives and EU/UK hydrogen projects, concentrate on foundational R&D;, dry electrode manufacturing, and critical infrastructure deployment. Strategic competition intensifies, demanding Western manufacturers and investors to secure supply chains, scale innovative production, and leverage policy support to maintain competitive positioning against rapid Asian market penetration.

4 Sub-Topic Summary

Sub-Topic	Headline	Momentum	Key Insight
-----------	----------	----------	-------------

Solid-State Batteries	Asian Firms Achieve 500 Wh/kg SSB Pilot Production, Western R&D; Focuses on Manufacturing Processes	Accelerating	Chinese companies like Ganfeng Lithium and CALB are rapidly advancing solid-state battery (SSB) commercialization, with prototypes reaching 500 Wh/kg and targeting 2027 pilot production. Western efforts, including U.S. DOE initiatives and German equipment makers, prioritize dry electrode manufacturing and interfacial engineering to enhance safety and reduce costs, crucial for scaling production.
Perovskite Solar Cells	Perovskite Solar Cells Achieve 33% Efficiency, Target Space and Building Integration	Building	Perovskite solar cells are reaching record efficiencies, with Chinese researchers achieving 33% for tandem cells and 30.3% for all-perovskite rigid cells. Focus is shifting to long-term stability, scalable manufacturing, and novel applications like transparent windows and space-grade flexible cells, with Asian and Japanese firms leading commercialization efforts and in-orbit testing.
Hydrogen Energy	Green Hydrogen Projects Accelerate Globally, Targeting Heavy Transport and Industrial Decarbonization	Watch	Green hydrogen projects are rapidly advancing towards Final Investment Decisions (FID) in Europe, India, and the Middle East, with significant government and private sector commitments. Innovations in electrolyzer technology are halving production costs, while hydrogen fuel cells are gaining traction in heavy-duty transport, aviation, and defense, driving infrastructure build-out and regulatory support.

Next-Gen Storage	Sodium-Ion Batteries Enter Mass Production, Utility-Scale BESS Deployments Surge to Meet AI Demand	Building	CATL initiated mass production of 175 Wh/kg sodium-ion batteries, positioning them as a cost-effective alternative for EVs and grid storage. Utility-scale Battery Energy Storage Systems (BESS) are seeing record financing and deployment, driven by renewable energy integration and the escalating power demands of AI data centers. Battery recycling is also scaling up to support circular economy goals.
-------------------------	--	-----------------	--

Toyota Accelerates Solid-State EV Battery Commercialization to 2027-2028

Source: Gemini Grounding (Company Tech News)

Summary: Toyota is targeting commercialization of solid-state batteries for EVs by 2027-2028, with pilot production of solid electrolytes beginning in financial year 2027 and mass production for over ten thousand vehicles annually by 2030. The first generation is proje...

WHY ENGINEERS SHOULD CARE

Design teams developing next-gen EVs should closely monitor Toyota's solid-state battery supply chain and performance benchmarks for 2027-2028, particularly the <10-minute fast-charging capability ...

Honda Targets 1,000km Range for Solid-State EVs by 2030, Initiates Production Line

Source: Gemini Grounding (Company Tech News)

Summary: Honda plans to introduce solid-state batteries into its EVs in the latter half of the 2020s, aiming for a 1,000 km range by 2030 and a further 1,249 km by 2040. A demonstration production line for these batteries commenced operations in January 2025, with mass...

WHY ENGINEERS SHOULD CARE

For EV platform architects and battery system engineers, Honda's aggressive targets for size, weight, and cost reduction (50% smaller, 35% lighter, 25% cheaper) coupled with a 500 Wh/kg energy density...

Japanese Suppliers Advance Solid-State Battery Materials and Form Factors

Source: Gemini Grounding (Company Tech News, PR Times)

Summary: Panasonic is accelerating solid-state battery research, with button-type samples for industrial machinery and automotive sensors shipping in fiscal year 2026 (designed for high heat resistance up to 125°C) and EV samples in fiscal year 2027, targeting 3-minute...

WHY ENGINEERS SHOULD CARE

Component and system design engineers should evaluate these advancements for diverse applications beyond mainstream EVs. Panasonic's high-temperature (125°C) and rapid-charge (3-minute) capabilities, ...

This Week's Japan Technology Highlights

Japanese automakers and suppliers are accelerating solid-state EV battery development, with Toyota targeting 1,000 km range and <10 min fast charging by 2027-2028.

China's Tightening Grip on EV Battery Supply Chain: Export Controls and Recycling Mandates

■ China's Move

China's retail sales of passenger new energy vehicles (NEVs) reached 619,000 units between May 1 and May 24, 2026, representing an 11% year-on-year decrease but a 13% increase from the previous month, with a 62.5% penetration rate (CPCA). Effective April 1, 20...

■ Technical Verification

[CONFIRMED]

China has implemented a mandatory "cradle-to-grave" battery recycling system with digital traceability and data reporting requirements (effective April 1, 2026). / China banned the export of sulphur...

[BOTTLENECK]

Securing diversified and resilient supply chains for critical battery minerals and advanced material processing technologies outside of China. / Developing cost-effective and scalable domestic recyc...

■ Implications for Western Engineers

- Procurement teams: Immediately assess exposure to China-sourced sulphuric acid and other critical precursors; diversify supply c...
- Battery R&D: Prioritize research into alternative cathode/anode materials and battery chemistries less reliant on China-controll...
- Manufacturing engineers: Evaluate the feasibility and cost of establishing domestic recycling capabilities for retired EV batter...

China's Solar Overcapacity Persists Amidst Export Surge and Anti-Dumping Measures

■ China's Move

Chinese solar module pricing showed mixed trends, climbing to 11.4 cents per watt by April 15, 2026, but then falling to an average of RMB 0.75/W (approximately \$0.104/W) by mid-May 2026 (Industry reports). China eliminated a 9% VAT export rebate on April 1, 2...

■ Technical Verification

[CONFIRMED]

China's installed solar capacity reached 1,250 GW and wind capacity 660 GW by end of April 2026. / New solar PV installations in China slowed significantly in Jan-Apr 2026 (-51% YoY), while wind add...

[BOTTLENECK]

Developing cost-competitive, high-efficiency solar PV manufacturing processes outside China that can compete with Chinese scale and pricing despite tariffs. / Innovating beyond current PV technologi...

■ Implications for Western Engineers

- Product development: Focus on next-generation PV technologies (e.g., higher efficiency cells, integrated storage solutions) that...
- Manufacturing engineers: Investigate automation and advanced manufacturing techniques to reduce labor costs and improve competit...
- Procurement specialists: Factor in ongoing and potential future anti-dumping duties and trade barriers when evaluating Chinese s...

Key Trends This Week (5 Total)

TR-01 HIGH

Cross-Domain

Asian Commercialization Dominates Next-Gen Energy

Asian Firms Lead 500 Wh/kg SSB Production and 33% Perovskite Efficiency

Chinese and other Asian companies are rapidly commercializing advanced energy technologies, including solid-state batteries (Ganfeng Lithium at 500 Wh/kg, CALB targeting 2027 pilot) and perovskite solar cells (Chinese researchers achieving 33% efficiency, China launching in-orbit tests). This aggressive market entry and scaling pose a significant competitive challenge for Western players.

SSB Energy Density

500 Wh/kg

Perovskite PCE

33%

Na-ion Energy Density

175 Wh/kg

► Ganfeng Lithium ► CALB ► BYD ► CATL ► Renshine Solar

Refs: S1-01 S1-02 S1-07 S1-17 S2-01 S2-10 S2-11 S2-15 S4-01 S4-02

TR-02 HIGH

Solid-State Batteries

Dry Electrode Manufacturing Revolutionizes Battery Production

Dry Electrode Process Cuts Battery CAPEX by 66%, OPEX by 81%

The dry electrode process is emerging as a pivotal innovation for both lithium-ion and solid-state battery manufacturing, promising significant cost reductions (up to 66% CAPEX, 81% OPEX) and environmental benefits by eliminating NMP solvents. Companies like Tesla, Hymson, and IPCO are investing heavily, recognizing its indispensability for moisture-sensitive solid electrolytes and thicker electrodes.

CAPEX Reduction

66%

OPEX Reduction

81%

Moisture Reduction

10x

► Tesla ► Hymson ► IPCO ► U.S. Department of Energy ► Solidion Technology

Refs: S1-03 S1-05 S1-06 S1-11 S1-13 S1-19 S4-04

TR-03 MED

Hydrogen Energy

Global Green Hydrogen Infrastructure & Policy Accelerate

Governments Mobilize \$40B+ Funding for Hydrogen Infrastructure and Production

Governments globally, including the U.S. (IRA \$40B loan authority), India (National Green Hydrogen Mission), and EU nations, are aggressively supporting green hydrogen infrastructure and production. This includes FIDs for 20-30MW projects, regulatory sandboxes, and strategic corridors to accelerate decarbonization in heavy industry, transport, and power generation.

US IRA Loan Authority

\$40 Billion

India H2 Target (2030)

5 MMT/year

UK H2 Project Capacity

30 MW

► U.S. Department of Energy ► Plug Power ► Carlton Power ► Power2X ► Hydrogen Council

Refs: S3-01 S3-02 S3-05 S3-07 S3-12 S3-14 S3-15 S3-18 S3-20 S3-25 S3-28

Advanced Battery Chemistries Diversify Grid & Mobility Storage

Sodium-Ion Batteries and Anode-Free Designs Expand Energy Storage Options

Beyond lithium-ion, new battery chemistries like sodium-ion (CATL's 175 Wh/kg Naxtra) and anode-free designs (targeting 400-480 Wh/kg) are diversifying energy storage solutions. These innovations offer cost-effectiveness, enhanced safety, and reduced reliance on critical materials, addressing diverse applications from EVs and grid stabilization to robotics and military drones.

Na-ion Energy Density

175 Wh/kg

Anode-Free Target

400-480 Wh/kg

Li-S Energy Density

380 Wh/kg

► CATL ► BYD ► Solidion Technology ► Nayuan New Materials ► U.S. Department of Energy

Refs: S1-04 S1-08 S1-12 S1-16 S1-18 S1-20 S4-01 S4-02 S4-03

Space & Defense Applications Drive Niche Energy Tech Demand

Hydrogen Drones and Flexible Perovskites Target Space and Military Sectors

Emerging demand from space and defense sectors is accelerating the development of specialized energy technologies. Hydrogen-powered drones are transitioning from prototype to procurement for the U.S. Army and German subsea operations, while flexible perovskite solar cells are being tested in space (Shenzhou-23) and targeted for commercial launch by 2035 for orbital applications.

Enecoat Space Target

2035

Shenzhou-23 Mission

6 months

Heven AeroTech Contract

Jan 2026

► Heven AeroTech ► Enecoat Technologies ► Renshine Solar ► JAXA ► U.S. Army

Refs: S1-16 S2-11 S2-12 S2-15 S3-21 S3-27

Macro Market Indicators

Indicator	Direction	Value	Note	Source
Global Green Hydrogen Investment	↑	Multi-billion	China and India lead pledges, driving project FIDs (S3-25)	Green Building Africa
US Clean Energy Funding (IRA)	↑	\$40 Billion	Additional loan authority for eligible projects through Sept 2026 (S3-20)	U.S. Department of Energy
Battery Recycling Black Mass Production	↑	800,000	Projected tons by 2035, up from 150,000 tons in 2025 (S4-14)	IndexBox
AI Data Center Energy Demand	↑	Significant	Driving rapid innovation and deployment of battery storage solutions (S4-09)	GeekWire, SAVRN, PV Tech

Macro Environment Summary

Global energy transition efforts are accelerating, marked by substantial government funding and private investment, particularly in green hydrogen and advanced battery storage. The U.S. Inflation Reduction Act continues to channel billions into clean energy infrastructure, while Asian nations lead in commercializing next-generation battery and solar technologies. The surging energy demands from AI data centers are creating new market opportunities for large-scale battery storage, simultaneously driving growth in battery recycling and critical mineral recovery. This dynamic landscape underscores a global race for technological leadership and supply chain resilience.

Market Data: LIT (Battery & Storage) Weekly Trend

87.15 USD +2.19%

Action Recommendations by Player

Action Recommendations for Western OEM

OEM Tesla, Daimler Truck (Cellcentric), General Motors, Ford

Western OEMs like Tesla are investing in dry electrode manufacturing for 4680 cells, while others like Daimler Truck (Cellcentric) are developing 1,000km range hydrogen fuel cell systems for heavy-duty transport. EV makers face a critical decision point regarding solid-state battery adoption, with Asian suppliers targeting 2027 mass production.

Risk

- If CATL achieves mass SSB production in 2027, Western OEMs without secured supply contracts will face 18-month sourcing delays
- If hydrogen infrastructure build-out lags, Western heavy-duty truck OEMs will miss 2030 decarbonization targets
- If dry electrode IP disputes escalate, Western OEMs may face production delays or licensing costs

Opportunity

- Integrate 175 Wh/kg sodium-ion batteries for cost-sensitive EV models, targeting \$50B+ market by 2030
- Partner with Western SSB developers (e.g., ProLogium) to secure 2029 supply for premium EVs
- Accelerate hydrogen fuel cell truck deployment with 1,000km range systems, targeting \$100B+ heavy-duty market

Actions This Week

- Initiate Q3 2026 discussions with ProLogium and Basquevolt for SSB supply agreements by Q4
- Evaluate sodium-ion battery integration for entry-level EV models by end of this week, targeting 2027 launches
- Form a cross-functional team to assess dry electrode IP landscape and potential licensing strategies within 3 months

Scenario: If Chinese SSB mass production in 2027 creates a 12-18 month lead, Western OEMs must secure dual-sourcing contracts with both Asian and Western partners by Q4 2026 to avoid market share loss.

Quick Win : Schedule Q3 2026 meetings with ProLogium and Basquevolt to assess their SSB technology roadmaps and secure early capacity reservations.

Action Recommendations for Western Contract Manufacturer

Foundry ProLogium, Solidion Technology, GlobalFoundries (analogous in semiconductors)

Western contract manufacturers like ProLogium (Taiwanese, building in France) are scaling up solid-state battery production, targeting Q2 2029 for a French gigafactory. Solidion Technology secured a patent for converting existing Li-ion facilities to SSB production, offering a pathway for Western foundries to adapt.

Risk

- If Asian SSB foundries achieve cost parity by 2028, Western players will face intense pricing pressure
- If dry electrode technology adoption is slow, Western foundries risk falling behind in manufacturing efficiency
- If raw material supply chains remain volatile, Western foundries face production delays and cost increases

Opportunity

- Offer conversion services for existing Li-ion lines to SSB production, targeting \$5B+ market by 2030
- Specialize in polymer-based solid electrolytes for flexible and robotics applications, targeting \$2B+ market by 2028

-
- Secure long-term contracts with Western OEMs for SSB and anode-free battery production, leveraging regional supply chain needs

■ Actions This Week

- Investigate Solidion Technology's patent for Li-ion to SSB conversion by end of this week for potential licensing
- Develop a pilot line for polymer-based solid electrolytes within 6 months, targeting robotics and wearable device OEMs
- Engage with U.S. DOE national labs (e.g., HydroGEN) to leverage advanced manufacturing capabilities for SSB scale-up by Q4 2026

□ Scenario: If Western OEMs commit to regional SSB supply chains by 2027, Western foundries must rapidly scale dry electrode and solid electrolyte production capacity to meet demand, or risk losing contracts to Asian competitors.

□ Quick Win : Contact Solidion Technology this week to explore licensing opportunities for their Li-ion to SSB conversion patent and assess feasibility for existing Western facilities.

Action Recommendations for Western T&M; Provider

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

The rapid development of solid-state batteries, perovskite solar cells, and hydrogen systems creates a surging demand for specialized testing, measurement, and certification services. UL Solutions has already verified ProLogium's SSBs as thermal runaway-free, setting a benchmark for safety validation.

■ Risk

- If testing standards for new energy technologies are delayed, Western T&M; providers face market entry barriers
- If Asian T&M; providers gain early expertise, Western firms may lose market share in emerging tech segments
- If equipment costs for advanced testing rise, Western T&M; providers face reduced profitability margins

■ Opportunity

- Develop specialized testing protocols for 500 Wh/kg SSBs and 33% perovskite cells, targeting \$1B+ market by 2028
- Offer certification for hydrogen fuel cell systems (e.g., Cellcentric BZA375) and infrastructure, targeting \$500M+ market by 2027
- Provide long-term stability and environmental reliability testing for perovskite solar cells, leveraging new standards

■ Actions This Week

- Launch a dedicated R&D; program for 500 Wh/kg SSB safety and performance testing standards by Q3 2026
- Partner with industry consortia (e.g., Hydrogen Council, IEA Hydrogen TCP) to shape future testing and certification requirements within 3 months
- Acquire or develop equipment for high-rate (20C) battery charging/discharging and extreme temperature testing by Q4 2026

□ Scenario: If new energy technologies achieve mass production by 2027, Western T&M; providers must have established, certified testing capabilities for SSBs, perovskites, and hydrogen systems to capture the initial wave of commercial validation demand.

□ Quick Win : Engage with UL Solutions this week to understand their thermal runaway verification process for SSBs and identify gaps in current Western testing capabilities.

Action Recommendations for Western Material Supplier

Material BASF, Dow, DuPont, Umicore, Redwood Materials

Western material suppliers like BASF are actively involved in green hydrogen production (SOEC test facility at Schwarzheide) and are well-positioned to develop advanced solid electrolytes (sulfides, oxides, halides, polymers) for solid-state batteries. The market for hydrometallurgical leaching reagents for battery recycling is also projected for significant growth.

Risk

- If Asian material suppliers dominate solid electrolyte production, Western firms face market access barriers
- If critical mineral sourcing becomes geopolitical, Western suppliers face supply chain disruptions
- If perovskite lead management regulations tighten, Western suppliers may face increased compliance costs

Opportunity

- Target \$4B+ market for solid electrolytes by 2030, leveraging DOE national lab R&D; (e.g., nano-sized sulfide electrolytes)
- Supply hydrometallurgical leaching reagents for battery recycling, addressing 800,000 tons of black mass by 2035
- Develop high-purity perovskite precursors and encapsulation materials for 33% efficient solar cells, targeting \$1B+ market by 2028

Actions This Week

- Allocate Q3 2026 R&D; budget to accelerate development of sulfide and polymer solid electrolytes, targeting 2027 pilot customers
- Establish partnerships with Western battery recyclers (e.g., Redwood Materials) to secure reagent supply contracts within 6 months
- Engage with perovskite solar cell developers (e.g., Sekisui Chemical) to co-develop advanced encapsulation materials by Q4 2026

□ Scenario: If dry electrode manufacturing becomes standard for SSBs by 2028, Western material suppliers must rapidly innovate and scale production of compatible solid electrolyte powders and binders to avoid being locked out of the next-gen battery market.

□ Quick Win : Review U.S. DOE's FY2025 CLIMR projects this week, specifically those advancing 'nano-sized high-conductivity sulfide solid electrolytes,' to identify potential collaboration opportunities.

Action Recommendations for Western Distributor / Trading Company

Distributor Arrow Electronics, Avnet, Brenntag

Western distributors play a crucial role in the supply chain for materials and components for advanced energy technologies. The growth in battery recycling and green hydrogen projects creates new opportunities for specialized logistics and distribution of recovered materials and hydrogen derivatives.

Risk

- If direct sourcing from Asian manufacturers increases, Western distributors face disintermediation risk
- If new energy material supply chains are fragmented, Western distributors face inventory management challenges
- If geopolitical tensions disrupt trade routes, Western distributors face increased logistics costs and delays

Opportunity

- Establish specialized distribution channels for solid electrolytes and perovskite precursors, targeting \$5B+ market by 2030
- Develop logistics solutions for green hydrogen and its derivatives (e.g., ammonia) to Europe, leveraging new corridors
- Become a key supplier of recycled critical minerals (zinc, manganese) from battery black mass, targeting \$1B+ market by 2035

■ Actions This Week

- Identify and onboard 3-5 Western solid electrolyte and perovskite precursor manufacturers as suppliers by Q4 2026
 - Conduct a feasibility study on establishing a green hydrogen logistics hub in Northwestern Europe within 6 months
 - Engage with battery recycling companies (e.g., Itronics, Redwood Materials) to secure distribution rights for recovered minerals by Q3 2026
- Scenario: If Western OEMs and material suppliers prioritize regional supply chains by 2027, Western distributors must rapidly build robust, transparent logistics networks for new energy materials to capture market share, or risk being bypassed.
- Quick Win : Contact Redwood Materials and Itronics this week to explore partnerships for distributing recovered critical minerals from battery recycling operations.

Action Recommendations for Western Equipment Maker

Equipment Hymson, IPCO, Sunfire, Nel ASA, Applied Materials, Thermo Fisher

Western equipment makers are critical enablers of next-generation energy technologies. Hymson and IPCO are advancing dry electrode and roll-to-roll manufacturing for batteries, while Sunfire (SOEC) and Nel ASA are innovating electrolyzer technology, with Nel ASA halving green hydrogen production costs.

■ Risk

- If Asian equipment makers offer lower-cost alternatives, Western firms face competitive pressure
- If SSB and perovskite manufacturing processes remain fragmented, Western equipment makers face R&D; uncertainty
- If government subsidies for equipment favor domestic suppliers, Western firms face market access restrictions

■ Opportunity

- Supply dry electrode manufacturing equipment for SSBs, targeting \$10B+ market by 2030 (66% CAPEX reduction)
- Provide advanced laser scribing and deposition equipment for 33% efficient perovskite solar cells, targeting \$2B+ market by 2028
- Develop and supply high-efficiency SOEC and PEM electrolyzers for green hydrogen projects, leveraging Nel ASA's cost reductions

■ Actions This Week

- Showcase dry electrode and roll-to-roll manufacturing solutions at The Battery Show Europe 2026, targeting 5 new customer engagements by Q3
 - Invest in R&D; for next-generation laser processing equipment compatible with wide-bandgap perovskites within 6 months
 - Form strategic alliances with Western green hydrogen project developers (e.g., Plug Power, Power2X) to supply electrolyzer technology by Q4 2026
- Scenario: If dry electrode manufacturing becomes the industry standard for advanced batteries by 2028, Western equipment makers must rapidly scale production and refine their solvent-free solutions to meet global demand, or risk losing market leadership to Asian competitors.
- Quick Win : Register for and actively participate in the upcoming CIBF2026 (China International Battery Fair) to benchmark against Asian dry electrode and SSB equipment innovations this week.

Impact Matrix (Players × Trends)

++ = Strong Tailwind + = Tailwind 0 = Neutral - = Headwind -- = Strong Headwind

Player	TR-01 HIGH Asian	TR-02 HIGH Dry El	TR-03 MED Global	TR-04 MED Advanc	TR-05 LOW Space
Western OEM	++	++	+	++	+
Western Contract Manufacturer	++	++	+	++	0
Western T&M; Provider	++	+	++	++	+
Western Material Supplier	++	++	++	++	+
Western Distributor / Trading Company	+	+	++	++	+
Western Equipment Maker	++	++	++	++	0

Timeline This Week (10 Events)

Date	Tag	Headline	Source
2026-05-21	product	Ganfeng Lithium initiates pilot production of 500 Wh/kg solid-state EV batteries in China (S1-01)	China S1-01
2026-05-22	milestone	Power2X approves construction for 20MW Djewels Green Hydrogen project in Netherlands (S3-05)	Netherlands S3-05
2026-05-22	product	Basquevolt launches BQV400L hybrid lithium metal battery, stepping stone to solid-state (S1-15)	Spain S1-15
2026-05-24	milestone	China launches Shenzhou-23 with perovskite solar cells for in-orbit testing (S2-15)	China S2-15
2026-05-25	policy	BYD files patent for composite sulfide solid electrolyte membrane (S1-07)	China S1-07
2026-05-26	deal	Sekisui Chemical invests ¥100 billion in flexible perovskite solar, targeting 2028 profitability (S2-14)	Japan S2-14
2026-05-27	milestone	Plug Power & Carlton Power reach FID for 30MW Barrow Green Hydrogen project in UK (S3-02)	UK S3-02
2026-05-27	deal	ProLogium announces Nasdaq SPAC merger, plans French gigafactory for Q2 2029 production (S1-09)	Taiwan/France S1-09
2026-05-28	product	CATL initiates mass production of 175 Wh/kg Naxtra sodium-ion batteries (S4-01)	China S4-01

Date	Tag	Headline	Source
2026-05-28	milestone	RWE secures full approval for Australia's first 8-hour duration Limondale Battery System (S4-11)	Australia S4-11

Company Spotlight

Plug Power [PLUG] ↑ FID for 30MW UK Green Hydrogen Project

Reached Final Investment Decision for a key UK green hydrogen project, supplying 6 PEM electrolyzers. However, faces ongoing profitability challenges despite aggressive market ambitions.

- Secure additional long-term off-take agreements for green hydrogen production by Q4 2026
- Accelerate cost reduction initiatives for electrolyzer manufacturing to meet 2028 profitability targets
- Diversify project pipeline beyond UK to leverage global green hydrogen policy support

CATL ↑ Mass Production of Naxtra Sodium-Ion Batteries

Initiated mass production of 175 Wh/kg sodium-ion batteries, securing 60 GWh in ESS contracts and deploying in EVs. This positions CATL as a leader in cost-effective, next-gen battery alternatives.

- Expand global manufacturing capacity for sodium-ion batteries to meet surging EV and ESS demand by 2027
- Invest in R&D; for higher energy density sodium-ion chemistries to compete with mid-range Li-ion by 2028
- Form strategic partnerships with Western OEMs to penetrate new markets for Na-ion battery applications

Sekisui Chemical [4204.T] ↑ ¥100 Billion Investment in Flexible Perovskite Solar

Unveiled a substantial ¥100 billion strategic investment into its flexible perovskite solar cell business, targeting ¥25 billion in sales and profitability by FY2028. This signals a decisive move to lead the next-gen solar market.

- Accelerate mass production scale-up for flexible perovskite solar cells to meet 2028 profitability target
- Explore strategic partnerships with Western building material companies for integrated BIPV applications by Q4 2026
- Invest in advanced encapsulation and stability research to extend product lifetime beyond 10 years for commercial viability

Technology Roadmap

2027

- ◆ Chinese battery manufacturers target SSB pilot production (S1-07)
- ◆ Enecoat Technologies begins small flexible perovskite cell production (S2-12)
- ◆ Spearmint Energy's 300MW/600MWh Red Egret BESS project completes (S4-05)
- ◆ DESRI/TAGC's 270MW solar-plus-storage projects become operational (S4-07)

2028

- ◆ Plug Power targets profitability (S3-03)
- ◆ Sekisui Chemical aims for ¥25B sales and profitability in flexible perovskite solar (S2-14)
- ◆ Power2X's 20MW Djewels Green Hydrogen project begins production (S3-05)
- ◆ IPX Power's 1.15 GW solar & 4.6 GWh storage project becomes operational (S4-06)
- ◆ Grenergy's 229MW solar & 183MWh storage project becomes operational (S4-08)

2029

- ◆ ProLogium's French gigafactory targets Q2 production for solid-state batteries (S1-09)

2030

- ◆ India targets 5 MMT/year green hydrogen production (S3-13)

-
- ◆ Japan's Aomori hydrogen power plant aims for operation (S3-26)

2035

- ◆ Enecoat Technologies targets commercial launch for space-grade flexible perovskite solar cells (S2-12)
- ◆ Global black mass production projected to exceed 800,000 tons (S4-14)

References (85 Total)

ID	Title	Source	Date	Region	Sub-Topic
S1-01	Ganfeng Lithium Initiates Pilot Production of 500 Wh/kg Solid-State EV Batteries	Electrek	2026-05-21	China	Solid-State Batteries
S1-02	Chinese Researchers Unveil 451.5 Wh/kg Solid-State Battery with 3-Minute Fast Charging	Car News China	2026-05-21	China	Solid-State Batteries
S1-03	Dry Electrode Process: A Pivotal Innovation for Solvent-Free Battery Manufacturing	PatSnap Eureka	2026-05-21	US	Solid-State Batteries
S1-04	Anode-Free and Solid-State Batteries: Performance, Challenges, and Outlook for Next-Gen Storage	PatSnap Eureka	2026-05-22	US	Solid-State Batteries
S1-05	U.S. Department of Energy Highlights National Lab Manufacturing Capabilities for Solid-State Battery R&D;	Department of Energy	2026-05-22	US	Solid-State Batteries
S1-06	The Rise of All-Organic Batteries: A Sustainable Frontier for Energy Storage	EINPresswire.com (via eScience Energy)	2026-05-25	US	Solid-State Batteries
S1-07	BYD Files Patent for Composite Sulfide Solid Electrolyte Membrane, China Targets 2027 Pilot Production	Car News China	2026-05-25	China	Solid-State Batteries
S1-08	U.S. Department of Energy Spotlights Flow and Solid-State Batteries as Key Next-Generation Energy Solutions	Department of Energy	2026-05-22	US	Solid-State Batteries
S1-09	Solid-State Battery Pioneer ProLogium to Go Public on Nasdaq via SPAC Merger, Plans French Gigafactory	electrek	2026-05-27	Taiwan	Solid-State Batteries
S1-10	Bone-Inspired CaF ₂ -Based Solid Solution Electrolyte Revolutionizes High-Temperature Stability in Lithium Metal Batteries	ACS Nano (ACS Publications)	2026-05-28	US	Solid-State Batteries
S1-11	Hymson's Dry Electrode Technology Revolutionizes Solid-State Battery Manufacturing with Major Cost and Efficiency Gains	electrive.com	2026-05-28	Germany	Solid-State Batteries
S1-12	Anode-Free Lithium Metal Batteries: Ushering in Ultra-High Energy and Green Storage Solutions	RSC Publishing	2026-05-26	UK	Solid-State Batteries
S1-13	Calendering Process for Solid-State Batteries: Precision Control Crucial for Performance and Integrity	PatSnap Eureka	2026-05-27	US	Solid-State Batteries
S1-14	Constructing Li ₃ P/Fe Dual-Conductive Interface for High-Performance Garnet Solid-State Lithium Metal Batteries	ACS Publications	2026-05-26	US	Solid-State Batteries

ID	Title	Source	Date	Region	Sub-Topic
S1-15	Basquevolt Launches BQV400L: A Hybrid Lithium Metal Battery Paving the Way for Solid-State Commercialization	electrive.com	2026-05-22	Spain	Solid-State Batteries
S1-16	Solid-State Batteries: The New Frontier for Robotics Powering Advanced Autonomous Systems	eScience Energy	2026-05-27	Switzerland	Solid-State Batteries
S1-17	CIBF2026 Reveals Solid-State Battery Drive Amidst Divergent Technology Pathways	Shanghai Metals Market (SMM)	2026-05-21	China	Solid-State Batteries
S1-18	Solidion Technology Achieves First Quarterly Revenue and Secures Patent for Solid-State Battery Production Conversion	Solidion Technology (via PRNewswire)	2026-05-21	US	Solid-State Batteries
S1-19	IPCO Showcases Enhanced Manufacturing Capabilities for Dry Electrode and Solid-State Batteries	electrive.com	2026-05-26	Germany	Solid-State Batteries
S1-20	Nayuan New Materials Unveils Anode-Free All-Solid-State Sodium-Ion Battery with 320 Wh/kg Energy Density	Shanghai Metals Market	2026-05-29	China	Solid-State Batteries
S2-01	Chinese Researchers Engineer Novel Passivation Strategy for High-Efficiency Perovskite/Silicon Tandem Solar Cells	Chinese Academy of Sciences	2026-05-28	China	Perovskite Solar Cells
S2-02	Perovskite Solar Cells in 2026: Navigating the Path to Stability, Scalable Manufacturing, and Commercialization	YouTube	2026-05-23	Global/USA	Perovskite Solar Cells
S2-03	Japanese Scientists Develop Organic Optoelectronic Device Capable of Simultaneous Light Harvesting and Emission	Photonics Spectra	2026-05-29	US	Perovskite Solar Cells
S2-04	Additive-Assisted Annealing Process Significantly Boosts Perovskite Solar Cell Stability and Efficiency	Bioengineer.org	2026-05-22	US	Perovskite Solar Cells
S2-05	Choosing Testing Equipment for Perovskite Solar Cell Pilot Lines: A Comprehensive Guide	Lecheng Intelligence Technology (Suzhou) Co., Ltd.	2026-05-26	China	Perovskite Solar Cells
S2-06	Perovskite Laser Scribing Equipment Buyer's Guide: Maximizing Production Efficiency Through Optimal Selection	Lecheng Intelligence Technology (Suzhou) Co., Ltd.	2026-05-25	China	Perovskite Solar Cells
S2-07	Building a Complete Perovskite Module Manufacturing Line: A Comprehensive Guide	Lecheng Intelligence Technology (Suzhou) Co., Ltd.	2026-05-24	China	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-08	Common Pitfalls and Solutions When Purchasing Perovskite Laser Processing Equipment	Lecheng Intelligence Technology (Suzhou) Co., Ltd.	2026-05-23	China	Perovskite Solar Cells
S2-09	Thermodynamic Inhibition of Bromine-Rich Phase Nucleation Drives Highly Stable Wide-Bandgap Perovskite Tandem Solar Cells to Record Efficiencies	Energy & Environmental Science (RSC Publishing)	2026-05-30	UK	Perovskite Solar Cells
S2-10	Chinese Researchers Achieve World Record 30.3% Efficiency for All-Perovskite Tandem Solar Cells	Knowrledge	2026-05-24	China	Perovskite Solar Cells
S2-11	Renshine Solar and Jingling Technology Form Strategic Alliance for Advanced Perovskite Material Development, Targeting Space Applications	Perovskite-Info	2026-05-24	China	Perovskite Solar Cells
S2-12	Enecoat Technologies Targets 2035 Commercial Launch for Space-Grade Flexible Perovskite Solar Cells	RYOEX	2026-05-25	Japan	Perovskite Solar Cells
S2-13	NTU Singapore Develops Ultra-Thin Transparent Perovskite Solar Cells for Seamless Integration into Windows and Facades	New Atlas	2026-05-26	Singapore	Perovskite Solar Cells
S2-14	Sekisui Chemical Pours ¥100 Billion into Flexible Perovskite Solar, Targeting 2028 Profitability	積水化学工業	2026-05-26	Japan	Perovskite Solar Cells
S2-15	China Launches Perovskite Solar Cells into Space Aboard Shenzhou-23 for In-Orbit Testing	Shanghai Metals Market (SMM PV)	2026-05-25	China	Perovskite Solar Cells
S2-16	Beyond Light Management: Unveiling the Multifaceted Advantages of Nano- and Micro-Textures in Perovskite Solar Cells	arXiv	2026-05-29	Global/USA	Perovskite Solar Cells
S2-17	Mitigating Potential-Induced Degradation in Perovskite Photovoltaics Through Positive-Voltage System Architectures	ACS Energy Letters (ACS Publications)	2026-05-27	US	Perovskite Solar Cells
S2-18	From Lab Promise to Product Reality: Navigating Challenges and Progress in Perovskite Photovoltaics Commercialization	Nature Reviews Clean Technology	2026-05-26	UK	Perovskite Solar Cells
S2-19	Self-Powered Perovskite Photodetector with 'Chocolate-Chip-Cookie' Architecture for Enhanced Spectral Sensing	Light: Advanced Manufacturing	2026-05-26	China	Perovskite Solar Cells
S2-20	Viscoelastic Grain-Boundary Regulation in Blade-Coated Tin-Lead Perovskites Enables High-Efficiency Tandem Solar Cells	ACS Publications	2026-05-25	US	Perovskite Solar Cells

ID	Title	Source	Date	Region	Sub-Topic
S2-21	Additive Engineering Mitigates Residual Stress and Boosts Stability in Wide-Bandgap Perovskite Solar Cells	Materials Futures (IOP Publishing)	2026-05-26	UK	Perovskite Solar Cells
S3-01	Oman, Netherlands Launch Strategic Feasibility Study for Green Hydrogen Corridor to Europe	Fuel Cell Works	2026-05-26	—	Hydrogen Energy
S3-02	Plug Power & Carlton Power Reach FID for 30MW Barrow Green Hydrogen Project in UK	Plug Power	2026-05-27	UK	Hydrogen Energy
S3-03	Plug Power Navigates Profitability Test Amidst Hydrogen Market Ambitions	Investing.com	2026-05-23	US	Hydrogen Energy
S3-04	ZESTAs Forges Global Alliance to Accelerate Liquid Hydrogen Adoption in Shipping	Green Hydrogen News	2026-05-26	UK	Hydrogen Energy
S3-05	Power2X Approves Construction for Djewels 20MW Green Hydrogen Project in the Netherlands	Global e-Fuels	2026-05-22	Netherlands	Hydrogen Energy
S3-06	International Call for Innovative Hydrogen Technology Projects to Accelerate Global Clean Energy Transition	EU Funding Portal	2026-05-22	International	Hydrogen Energy
S3-07	Hydrogen Council CEOs Demand Decisive Government Action on Hydrogen Infrastructure and Production	Hydrogen Council	2026-05-28	International	Hydrogen Energy
S3-08	DOE's HydroGEN Consortium Accelerates Advanced Water Splitting Material Research for Hydrogen Production	U.S. Department of Energy	2026-05-22	US	Hydrogen Energy
S3-09	MAX Power Unveils Lawson Natural Hydrogen Discovery and AI-Powered MAXX LEMI Platform in Japan	Pacific Group	2026-05-28	Canada	Hydrogen Energy
S3-10	DOE's FY2025 CLIMR Projects Drive Commercialization of Advanced Energy Technologies	U.S. Department of Energy	2026-05-22	US	Hydrogen Energy
S3-11	Scientists Propose Hemp-Based Biorefinery for Co-Production of Green Hydrogen, Bioenergy, and Therapeutic Cannabinoids	BioEnergy Times	2026-05-22	US	Hydrogen Energy
S3-12	Indian Petroleum Secretary: Green Hydrogen Critical for Nation's Escalating Energy Demand	Vizag Industrial Scan (VIS)	2026-05-22	India	Hydrogen Energy
S3-13	India Approves First Hydrogen Train Operation, Advancing Rail Decarbonization with Fuel Cell Technology	The Indian Express	2026-05-27	India	Hydrogen Energy
S3-14	India's Green Hydrogen Sector Emerges as Major Commercial Opportunity: Financing & Regulation Dynamics	King Stubb & Kasiva	2026-05-25	India	Hydrogen Energy
S3-15	India's Top Green Energy Companies Lead Charge in Green Hydrogen Production (2026)	Avaada Group	2026-05-25	India	Hydrogen Energy

ID	Title	Source	Date	Region	Sub-Topic
S3-16	U.S. DOE Coordinates Hydrogen and Fuel Cell Technology R&D; Through National Consortia	U.S. Department of Energy	2026-05-22	US	Hydrogen Energy
S3-17	China's Gongqing New Energy and FAW Jiefang Forge Strategic Alliance for Hydrogen Fuel Cell Heavy-Duty Trucks	Shanghai Metals Market	2026-05-26	China	Hydrogen Energy
S3-18	Government Subsidies and Infrastructure Drive Hydrogen Commercial Vehicle Transformation in Japan and South Korea	Frost & Sullivan	2026-05-25	Japan, South Korea	Hydrogen Energy
S3-19	Cellcentric Unveils BZA375 Fuel Cell System: Setting New Heavy-Duty Standard with Over 1,000km Range	cellcentric	2026-05-22	Germany	Hydrogen Energy
S3-20	U.S. DOE Bolsters Energy Infrastructure Investment Under Inflation Reduction Act (IRA)	U.S. Department of Energy	2026-05-22	US	Hydrogen Energy
S3-21	Western Defense Ecosystems Transition Hydrogen Drones from Prototype to Procurement: US Army Airborne, Germany Subsea	Autonocion.com	2026-05-25	USA, Germany	Hydrogen Energy
S3-22	Dongfeng Unveils 400 kW Hydrogen Fuel Cell Truck with 1,700 km Range Platform, Targeting Heavy Transport Decarbonization	electrive.com	2026-05-27	China	Hydrogen Energy
S3-23	Sunfire Breaks Ground on Industrial-Scale SOEC Electrolyzer Test Facility at BASF Schwarzheide for Green Hydrogen Production	Industry News / Sunfire	2026-05-26	Germany	Hydrogen Energy
S3-24	Nel ASA's New Electrolyzer Halves Green Hydrogen Costs, Paving Way for Large-Scale Industrial Deployment	Industry News / Nel ASA	2026-05-22	Norway	Hydrogen Energy
S3-25	2026 World Hydrogen Summit Highlights Progress: Green Hydrogen Projects Accelerate in Paraguay, India, Spain	Green Building Africa	2026-05-24	Global	Hydrogen Energy
S3-26	Japan to Construct Dedicated Hydrogen Power Plant in Aomori, Boosting Energy Security and Decarbonization	The Japan News	2026-05-24	Japan	Hydrogen Energy
S3-27	Unither Bio Electronic and Robinson Helicopter Successfully Complete Manned Flight of Hydrogen-Powered Helicopter	YouTube (Unither Bio Electronic / Robinson Helicopter)	2026-05-25	US	Hydrogen Energy
S3-28	South Korea Approves Regulatory Sandbox for Hydrogen Production and Underground Storage	Seoul Economic Daily	2026-05-26	South Korea	Hydrogen Energy
S4-01	CATL's Naxtra Sodium-Ion Batteries Achieve 175 Wh/kg, Drive Mass Production for EVs and Grid Storage	EVTech.News	2026-05-28	China	Next-Gen Storage
S4-02	Global Sodium-Ion Battery Market: Key Manufacturers & Strategic Trends 2026	Blackridge Research & Consulting	2026-05-21	US	Next-Gen Storage

ID	Title	Source	Date	Region	Sub-Topic
S4-03	Overcoming Lithium Retention Challenges for Anode-Free Batteries: Pathways to Commercialization	PatSnap Eureka	2026-05-22	US	Next-Gen Storage
S4-04	Tesla Intensifies Dry Electrode Battery Manufacturing Investment and IP Protection	Tesmanian, PatSnap Eureka, Tesla Rati	2026-05-27	US	Next-Gen Storage
S4-05	Spearmint Energy Secures \$450M for 300MW/600MWh Texas Battery Storage Project	Mercom India	2026-05-25	US	Next-Gen Storage
S4-06	IPX Power Secures Record \$4.95 Billion for 1.15 GW Solar & 4.6 GWh Storage Project in California	OneStop ESG	2026-05-25	US	Next-Gen Storage
S4-07	DESRI and TAGC Break Ground on 270MW Solar-Plus-Storage Projects in New Mexico	PV Tech	2026-05-27	US	Next-Gen Storage
S4-08	Grenergy, Georgia Power Ink Long-Term Hybrid PPA for 229MW Solar & 183MWh Storage Project	IndexBox	2026-05-21	US	Next-Gen Storage
S4-09	Battery Storage Solutions Scale Up to Power Surging AI Data Center Demands	GeekWire, SAVRN, PV Tech	2026-05-23	US	Next-Gen Storage
S4-10	Adani Green Energy Commissions Mega 3.37 GWh Battery Storage Project in Khavda, India	Chemical Industry Digest	2026-05-26	India	Next-Gen Storage
S4-11	RWE Secures Full Approval for Australia's First 8-Hour Duration Battery System in NSW	SolarQuarter	2026-05-28	Australia	Next-Gen Storage
S4-12	Chile's Battery Storage Surge: Nation Exceeds 2026 Targets, Fast-Tracks 2050 Goals with Landmark Long-Duration Projects	Energy-Storage.News, BIOPOWER ESS	2026-05-28	Chile	Next-Gen Storage
S4-13	Itronics Launches Critical Mineral Recovery from Alkaline Battery Black Mass	Morningstar	2026-05-21	US	Next-Gen Storage
S4-14	Battery Recycling: Hydrometallurgical Leaching Reagents Market Projected for Significant Growth by 2035	IndexBox	2026-05-26	US	Next-Gen Storage
S4-15	Redwood Materials Secures \$350M to Accelerate EV Battery Recycling Operations	drivtu.com	2026-05-27	US	Next-Gen Storage
S4-16	Community Concerns and Stricter Zoning Emerge Against Battery Storage Facilities Across the U.S.	Citizen Journal, Platts	2026-05-27	US	Next-Gen Storage

Editor's Note

Navigating the Global Energy Transition: Western Imperatives

The past week's developments underscore a critical juncture in the global energy transition. While Asian nations are rapidly converting advanced energy research into commercial products—evidenced by 500 Wh/kg solid-state batteries and 33% efficient perovskite solar cells—Western economies are primarily focused on

foundational R&D;, infrastructure build-out, and strategic policy frameworks like the IRA. This divergence creates both opportunities and risks for Western manufacturers, investors, and executives, demanding a proactive and integrated strategy.

The dry electrode manufacturing process, with its potential to cut CAPEX by 66% and OPEX by 81%, represents a pivotal technology for Western battery producers to regain competitive ground. Simultaneously, the accelerating deployment of green hydrogen projects and utility-scale battery energy storage systems, driven by AI data center demand and decarbonization targets, highlights the urgent need for robust supply chains and localized production capabilities. Western players must leverage their strengths in advanced materials, precision equipment, and regulatory support to scale innovation.

To maintain competitive positioning, Western stakeholders must prioritize securing critical material supply chains, investing in scalable manufacturing technologies, and fostering cross-sector collaboration. The rapid pace of Asian commercialization necessitates a dual strategy: aggressive R&D; to leapfrog current technologies and strategic partnerships to ensure access to near-term market-ready solutions. Failure to act decisively risks ceding long-term leadership in these foundational energy sectors.

- ◆ How can Western OEMs and material suppliers accelerate the adoption of dry electrode manufacturing to compete with Asian battery production costs by 2028?
- ◆ What specific policy mechanisms and investment incentives are required to bridge the gap between Western R&D; in solid-state batteries and perovskite solar cells, and their large-scale commercialization by 2030?
- ◆ How can Western T&M; providers and equipment makers collaborate to establish global testing standards and supply chains for green hydrogen and advanced battery systems, ensuring quality and interoperability?

Troy Technical Weekly Editorial Team Editorial Assistant

Next Issue Vol. 49 Monday, June 8, 2026 06:00 JST Feature: Advanced Materials for Sustainable Energy

troy-technical.com original curation. Article copyrights belong to original authors. | Gemini API + Claude | Monday, June 1, 2026 06:00 JST