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ESS Supply, Technology, and Policy Report

Report sample

Q3 2025

ESS Supply, Technology, and Policy Report

The Intertek CEA Energy Storage Systems (ESS) Supply, Technology, and Policy Report (STPR) is published on a quarterly basis and covers global and regional supply chain analysis, technology trends, and regional policy analysis. Given the breadth of technological developments in energy storage, there will be a new technology focus each quarter; **this quarter, it covers innovation in container and system layout efficiency and the new cap and floor regime for long-duration energy storage in the UK.**

The strategic value of the STPR lies in its ability to enhance project profitability by leveraging industry incentives. It establishes security of supply through a thorough understanding of trade policy and aids stakeholders in understanding the project performance implications of new technology adoption.

Deliverables of the STPR include a quarterly report and full analyst support for any questions pertaining to its coverage. With the STPR, stakeholders gain a detailed view of the supply landscape, technology trends, and policy impacts, empowering them to make informed decisions and optimize their strategies in the PV and energy storage sectors.

In this report you will find:

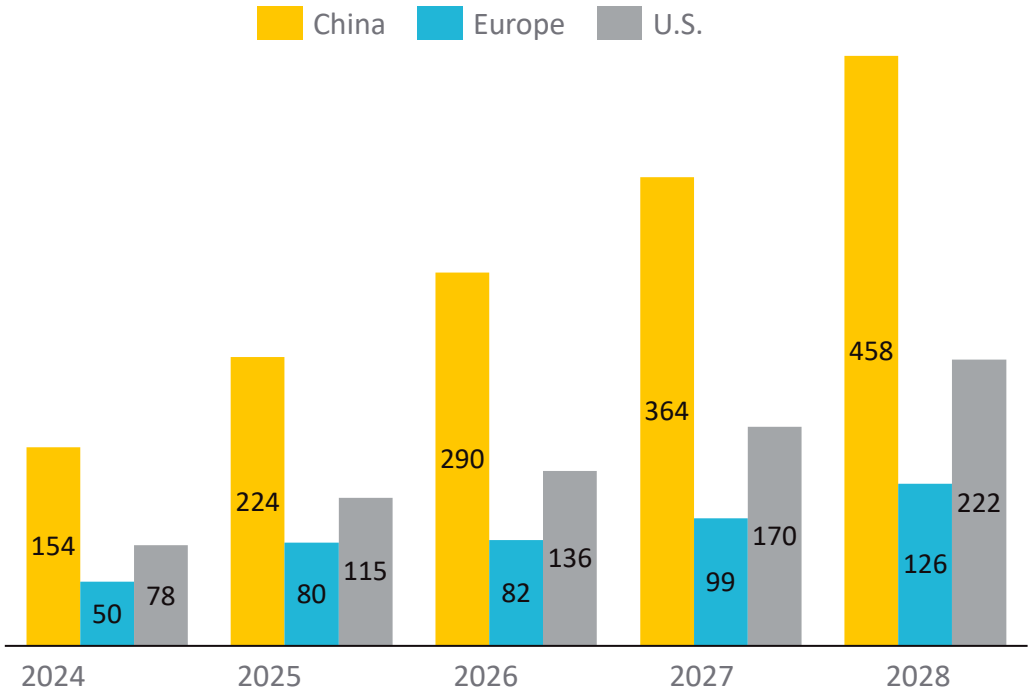
- Global and regional supply chain analysis
- Technology trends
- Regional policy analysis

Table of contents (full report)

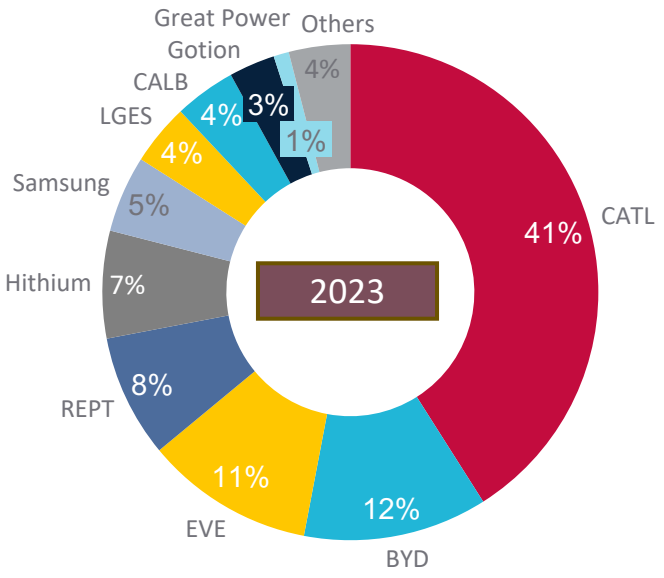
Global ESS battery shipments reached over 300 GWh in 2024

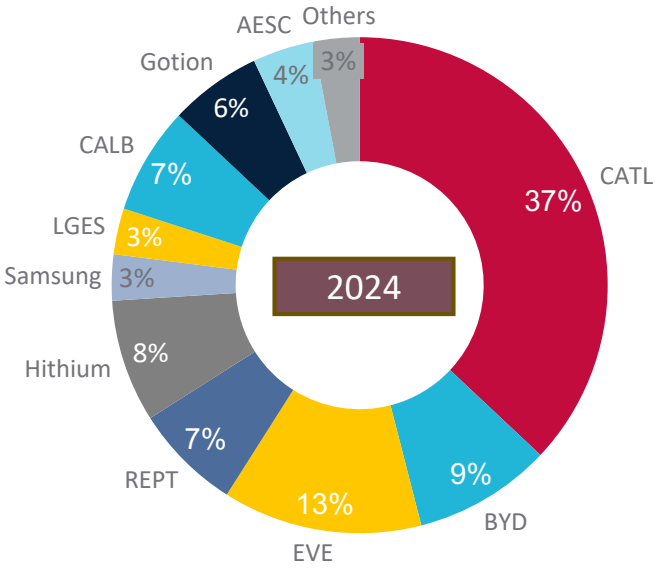
ESS battery market remains concentrated; the top five suppliers account for >70% market share

Global ESS battery shipments, by region (GWh)



Global ESS battery shipments market share, by supplier (%)





- Global ESS battery shipment reached saw a CAGR of 82.7% from 2020-24, increasing from 21 GWh to 301 GWh.
- Factors such as growth in global electricity demand, the need to firm intermittent renewable energy resources, policy support across different regions, demand from data centers, and improved cost effectiveness of ESS have ramped up the demand for ESS batteries globally.
- While there is a notable overlap between the global top ten suppliers in EV batteries and ESS batteries, the ESS battery market remains relatively concentrated with the top five suppliers accounting for over 70% share of the global market in terms of shipment volume.

ESS battery shipment forecast data reported by GGII and SNE Research.

China’s regulations strengthen oversight of low-price competition

Industry self-regulation and the new price law jointly promote market fairness

Industry Self-Regulation

On August 13, 2025, the China Industrial Association of Power Sources released a draft proposal titled “Initiative on Maintaining Fair Competition Order and Promoting the Healthy Development of the Energy Storage Industry”. A total of 149 enterprises and institutions, including **Gotion, EVE, BYD, Hithium, Trina Energy Storage and CALB** have participated in and signed the initiative.

(1) Enterprises and institutions operating within China that engage in the manufacturing, integration, operation, maintenance, and application of lithium battery materials, cells, battery modules, energy storage inverters, energy storage system integration, power services, project investment, and related products.

(2) Participants pledged to strictly comply with relevant national laws, regulations, and industry management rules governing fair pricing and competition, particularly the Price Law, the Bidding Law, the Anti-Unfair Competition Law, and the Anti-Monopoly Law.

New Price Law Prohibits Low-Price Competition

On July 24, 2025, the National Development and Reform Commission and the State Administration for Market Regulation jointly drafted the “Draft Amendment to the Price Law of the People's Republic of China.”

(1) Under this policy, the pricing authority may establish pricing mechanisms to determine the level of government-set prices. Cost supervision and review shall be clearly defined as a crucial procedure in government pricing, further strengthening oversight of pricing costs.

(2) The policy further clarifies the criteria for identifying unfair pricing practices, by refining the standards for determining low-price dumping, regulating market pricing order, and addressing “involutionary” competition. Under the policy, **no entity shall engage in dumping by selling below cost** for the purpose of driving competitors out of the market.

> *On September 17, 2025, CATL founder Zeng Yuqun stated at the 2025 World Energy Storage Conference that over the past three years, the price of energy storage systems in China has dropped by approximately 80%. Recently, the winning bid for a certain centralized procurement project even fell below 0.4 yuan (USD 0.056) per watt-hour, severely deviating from the cost.*

(3) The policy strengthens the legal liability for price violations and adjusts penalty provisions for unfair pricing practices by business operators.

Data from the State Administration for Market Regulation, National Development and Reform Commission, China Industrial Association of Power Sources

Q3 2025 changes to US import tariffs & duties

Changes in Q3 2025?	Policy	Tariff or duty value	Effective date(s)	Scope	Q3 2025 changes	Impact
No	Section 301	7.5% - 50%	2018	Imports from China (many HTS codes)	None: 301 impacts are already “baked in” to current prices & market assumptions.	Low-to-moderate
Yes	Section 232	50%	June 4, 2025	Global imports of steel and aluminum	On August 18, 2025, US President Trump added 407 products to the list of “derivatives” subject to steel & Al tariffs.	Low
Yes	Section 232	50%	July 30, 2025	Global imports of refined copper and derivatives	On July 30, US President Trump imposed 50% tariffs on refined copper products and “derivatives.”	Low
No	International Emergency Economic Powers Act (IEEPA)	MEX/CAN non-energy: 0% - 25% China: 20% CAN energy, potash: 10%	February 4, 2025 (China); March 4, 2025 (Canada and Mexico)	Imports from China, Canada, Mexico	None	Low-to-moderate
Yes	IEEPA	Global: 10% - 41% China: 34%	April 5, 2025 (10%) Nov 10, 2025 (China) Aug 1, 2025 (country-specific)	All imports	President Trump made several changes to the IEEPA 3 tariffs in Q3 2025, including delaying implementation and lowering rates for dozens of nations. The IEEPA 3 tariff on China was lowered to 34% and delayed to Nov 10, 2025.	Moderate
Yes	IEEPA	25%	August 27, 2025	Imports from India	On August 6, 2025, President Trump imposed an additional 25% tariff on products from India.	Low
Yes	Anti-dumping and countervailing duties (AC/CVD)	106% - 824%	July 18, 2025	Anode active material (AAM) from China; anodes and cells with Chinese AAM	On July 18, 2025, the US Commerce Department published its preliminary anti-dumping determination in the case on AAM from China. The rates were much higher than in the CVD portion of the case.	Low

Bill of Materials (BoM), Mexico (MEX), Canada (CAN).

EU Commission presents priorities for upcoming year

Financial support for BESS, made in Europe criteria and bureaucracy simplification

On September 10, 2025, Ursula von Der Leyen gave the 2025 State of the European Union 2025 address, which sets out the EU policy agenda for the upcoming year. The speech centered around key priority points, including defense, competitiveness, and the single market.

EUR 1.8 billion Battery Booster Package

Impact on the BESS sector?

The BBP will be support the development of EU battery manufacturing and supply chains. The exact details on how this funding will be provided are unclear. However, several indicators throughout 2025 suggest that the emphasis will be on EV battery manufacturing.

Made In Europe criteria for public procurement

Impact on the BESS sector?

Proposals lack detail, but impact is likely minimal, considering the minimal role of public procurement in the market and the current approach of the EU Commission that states ESS developers do not have to comply with “resilience” criteria under the NZIA.

Industrial Accelerator Act

Impact on BESS sector?

Details of the Act are unknown, but CEA has low expectations for impact given the limited efficacy of recent industrial policies in terms of supporting EU BESS manufacturing and supply chains.

Simplification of the Omnibus law

Impact on the BESS sector?

The Omnibus Package IV has delayed ESG due diligence reporting requirements on battery manufacturers until 2027. This provides an additional two years to review, adjust, and report on standards and labor conditions in supply chains while continuing to allow products to circulate in the EU market. Battery Passports (QR code with BESS information) must still be shown from February 2027.

“Doubling down on new trade partnerships and diversification”

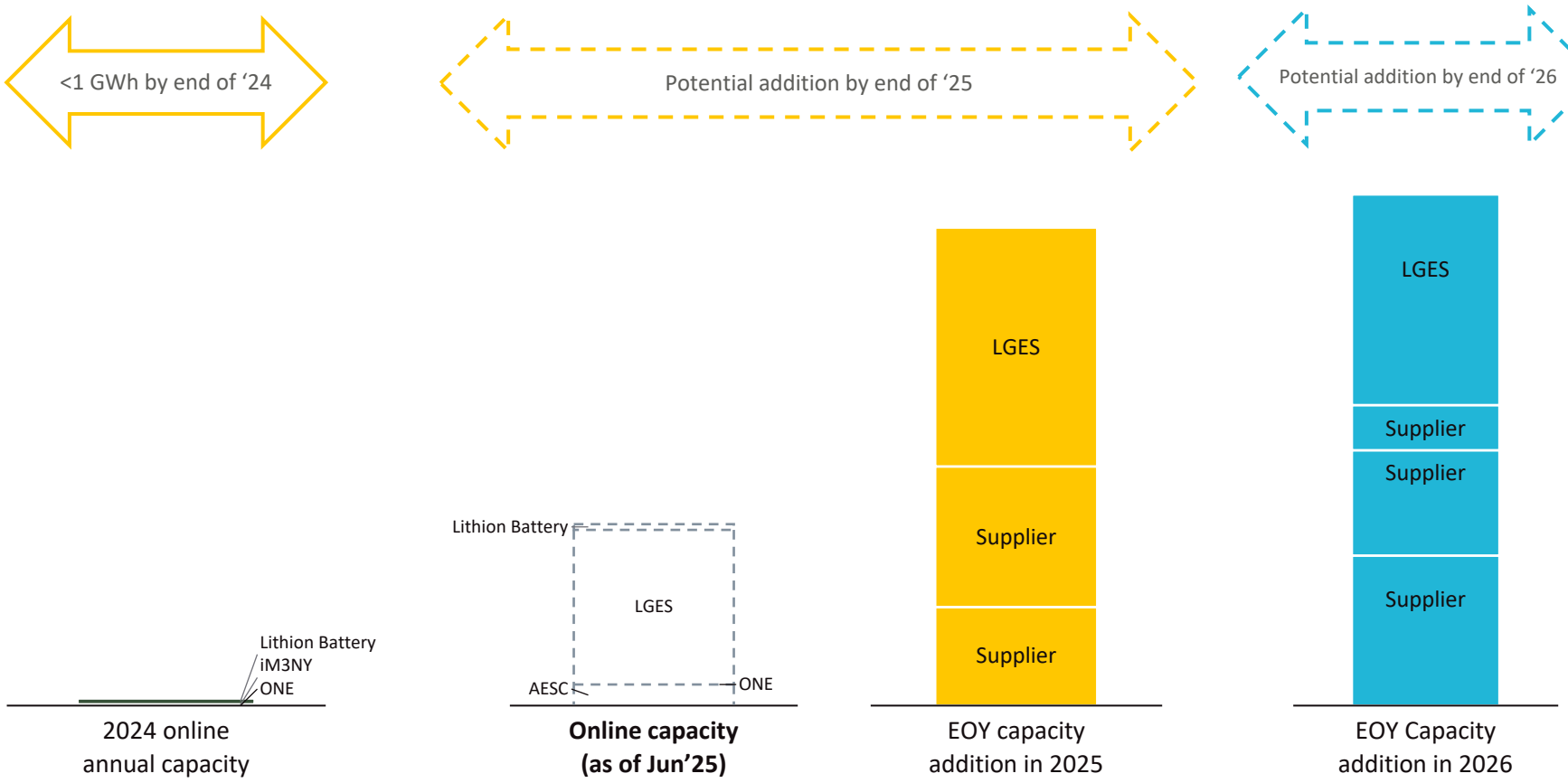
Impact on the BESS sector?

This was not specific to BESS in the speech and the expected impact on BESS is unclear. However, diversification of supply chains is becoming a key topic in EU policy. Diversifying supply chains away from China could result in higher prices in the short term. Growth of supply chains in other countries/regions (i.e., Southeast Asia, Australia) will be critical for successful diversification.

LFP-based ESS cell production already started in US in June 2025

SK On and Samsung aim to start ESS cell production in 2026

U.S. announced ESS-dedicated LIB cell capacity addition, 2025 and 2026 (GWh)



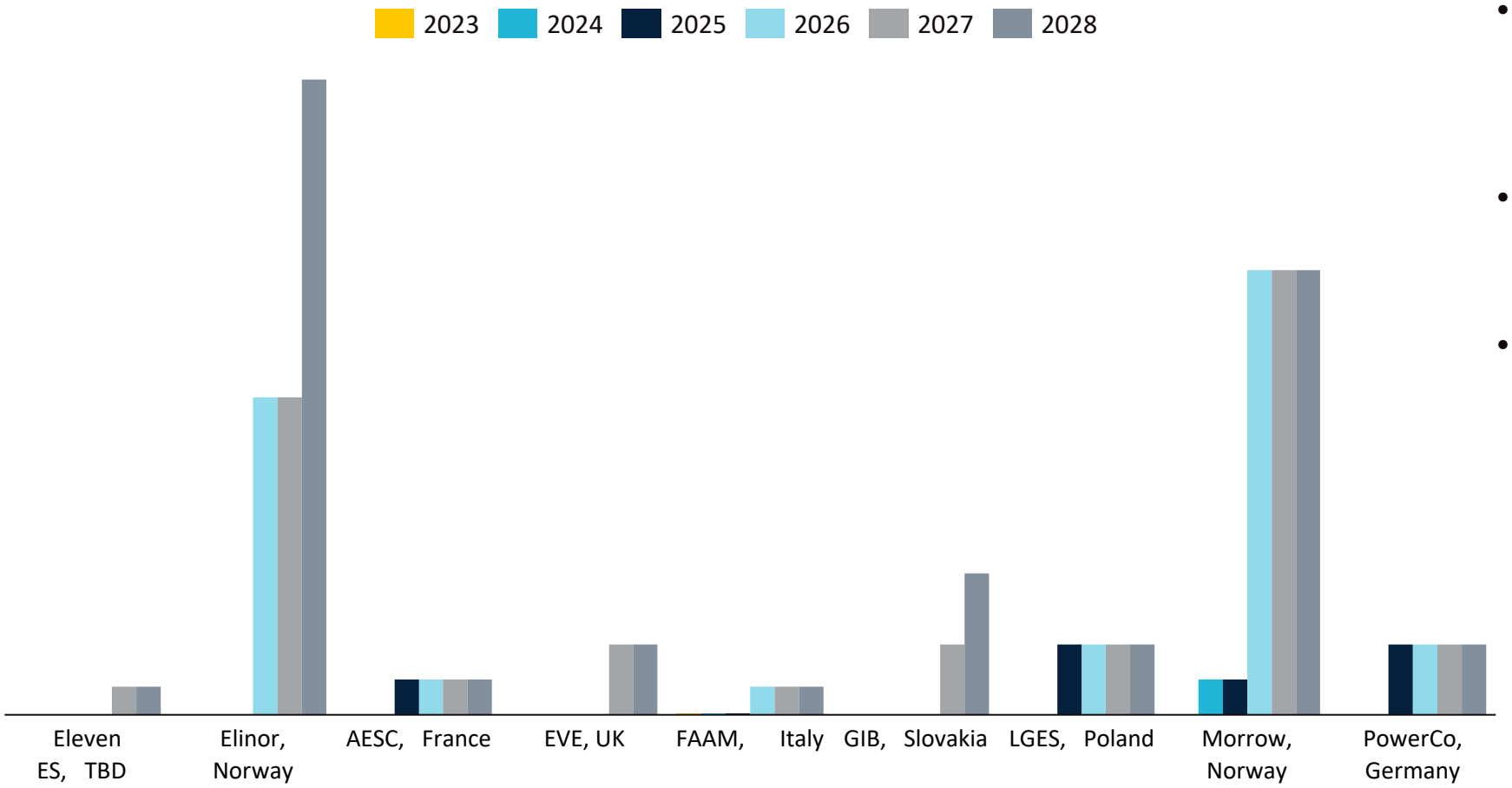
- Both LGES and AESC have already started manufacturing LFP-based ESS cells in the US.
- LGES aims to the be leading ESS cell supplier in the US, with the most planned GWh capacity by the end of 2026.
- Growing demand for FEOC-compliant ESS cell capacity, increased tariffs on China-made batteries, and weak EV demand is encouraging Korean suppliers to ramp up their domestic ESS cell capacity.
- SK On and Samsung plan to follow the same strategy, with each likely to bring ESS cell capacity online in the next two years.

Capacity data aggregated by CEA based on company announcements and disclosures. Data does not account for utilization, ramp times, or other potential production delays. Timelines are based on supplier statements or industry best practices if no timeline data was reported.

AESC and LGES plan to start ESS cell production in Europe

Chinese suppliers are still focused on the EV sector in the region

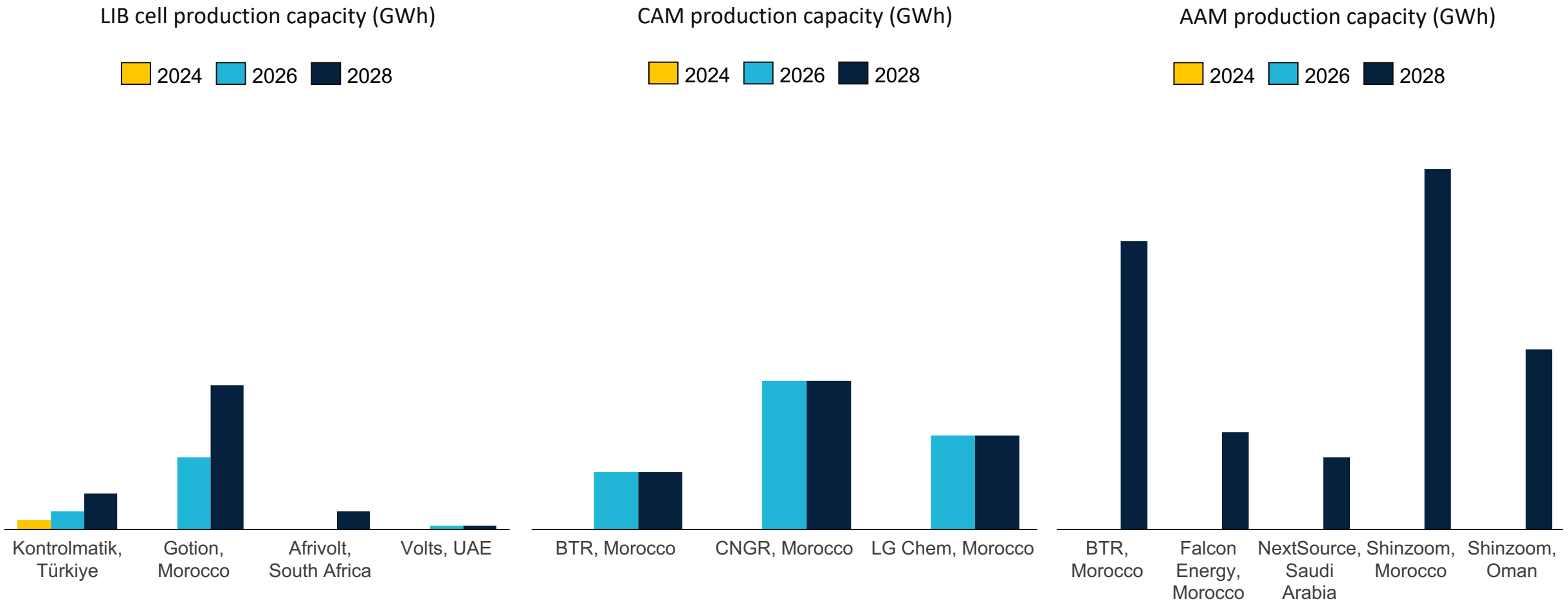
Announced LFP cell production capacity, ESS, Europe (GWh)



- Suppliers like AESC and LGES have plans to start LFP-based ESS cell production in Europe to serve the regional market demand.
- Chinese suppliers, however, have kept majority of their planned capacity for EV applications.
- Lack of tariffs on China-made batteries is impacting the domestic cell manufacturing capacity for ESS use.

Data aggregated by CEA based on company announcements and disclosures. Data does not account for utilization, ramp times, or other potential production delays.

Chinese suppliers dominate the LIB cell manufacturing supply chain in Middle East and Africa



Capacity data aggregated by CEA based on company announcements and disclosures. Data does not account for utilization, ramp times, or other potential production delays. Timelines are based on supplier statements or industry best practices if no timeline data was reported. Data includes both EV and ESS cell capacity.

Tesla unveils Megapack 3, its next-gen utility-scale system

Showcasing simplified architecture and enhanced performance vs. Megapack 2

- Tesla introduced the Megapack 3, the latest iteration of its utility-scale battery storage system, on September 8, 2025, at the RE+ event in Las Vegas.
- The Megapack 3 is designed to reduce balance-of-system (BOS) costs and accelerate grid installation by providing a plug-and-play solution.
- It will be manufactured at Tesla's new one-million-square-foot Megafactory in Brookshire, Texas (greater Houston area), with a planned annual capacity of 50 GWh.
- Tesla expects to begin deliveries in the second half of 2026.

Megapack 3 vs. Megapack 2

Parameters	Megapack 2	Megapack 3	Comment
Usable energy	3.9 MWh	5 MWh	Increase in per-unit energy, reducing units needed per project
Round-trip efficiency	Between 92 and 94%	Not disclosed	Expected to match or exceed Megapack 2; awaiting official data sheet
Weight	~38 tons (~84,000 lb)	~39 tons (~86,000 lb)	Both exceed the 80,000 lb. 5-axle trailer limit but can be moved with a 7-axle trailer.
Dimensions (LxWxH)	~28.9 ft (~8.8 m) x ~**9.14 ft** (~2.785 m) x ~9.17 ft (~2.785 m)	Not disclosed, said to be designed for over-the-road transport without oversize classification	Megapack 2 exceeds standard U.S. road width (8.5 ft), requiring an oversize permit. Megapack 3 reportedly avoids this, but the exact dimensions data is to be confirmed.
Lifespan	15 to 20 years	25 years	Longer claimed lifespan improves project economics. However, real-world validation is to be confirmed.
Operating temperature range	−20 °C to +50 °C	−40 °C to +60 °C	Megapack 3 is suited for extreme climates, reducing the need for external climate control
Thermal management	Distributed cooling/heating loop across modules (field wiring required)	Centralized thermal bay, factory-integrated	Megapack 3 simplifies installation and maintenance with fewer field connections.

Report contents: 79 pages of in-depth reporting

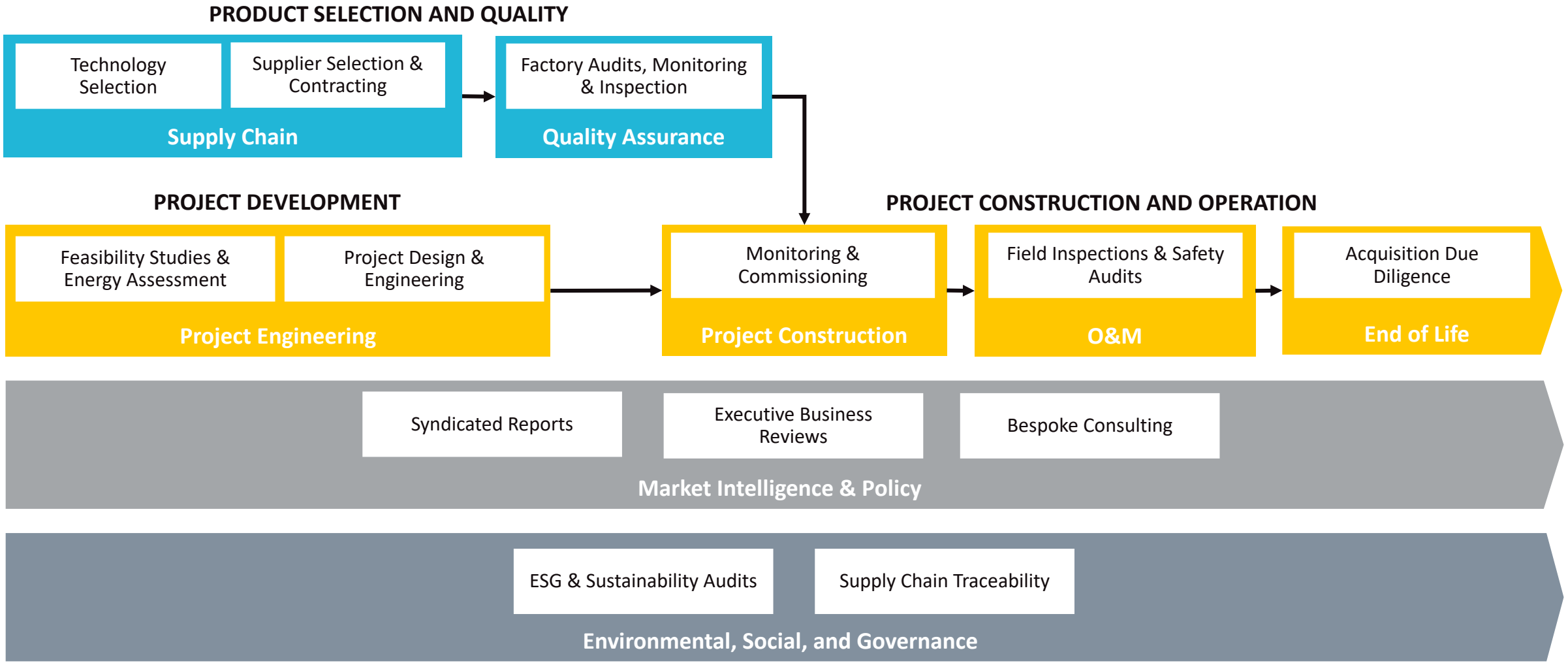
Intertek CEA's Supply, Technology, and Policy Report applies a systems level thinking approach to provide comprehensive industry analysis. We report on current trends and have a pulse on the latest solar, energy storage and green hydrogen technologies set to disrupt the clean energy landscape.

Click here to purchase full report

Table of contents Q3 2025

Intertek CEA comprehensive services span entire PV & ESS value chains

Intertek CEA helps control quality, supply, and implementation risk for PV and energy storage



Intertek CEA market intel offers tailored solutions catering to client needs

Policy developments, pricing outlooks, supply landscapes, technology evolution

Syndicated Reports

Best-in-class coverage of supply, technology, pricing and policy, featuring the industry's most in-depth analysis of techno-commercial issues facing the PV and ESS sectors

Executive Business Reviews

Fully interactive strategy sessions, hosted by CEA subject matter experts, agenda set by client needs and supported by CEA's complete research library

Bespoke Consulting

Highly focused projects fully customized to client specifications, delivering executive decision support for our client's most critical strategic endeavors

Comprehensive market intelligence on pricing, industry, and supply

Six reports deliver critical industry insights across the value chain

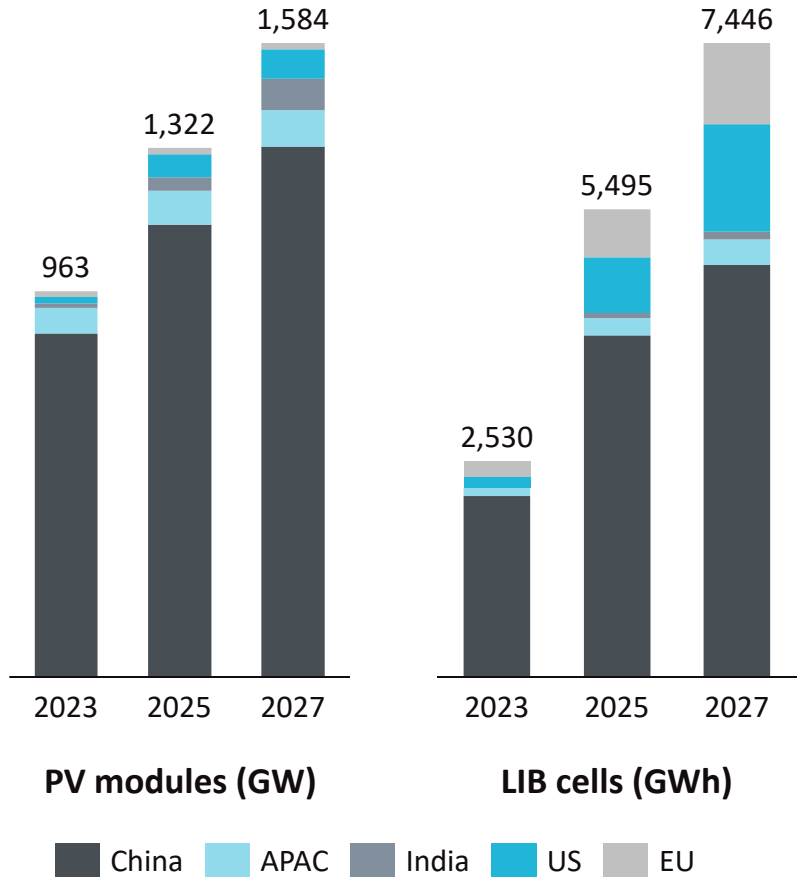
REPORT	CONTENT FOCUS	TARGET AUDIENCE	STRATEGIC VALUE	DELIVERABLES	REGIONAL CONTENT AREAS
Price Forecasting Reports (PFR) 1. PV modules PFR 2. Energy storage systems PFR	Bottom-up pricing model with full value-chain cost segmentation Scenario analysis including multiple points of product origin Detailed analysis of major market drivers impacting product costs	**Value chain companies** C-level executives Strategy analysts Procurement teams **End-users** Development originators Project planning & estimators O&M managers **Financial institutions** Private equity investors Investment bankers Debt providers	• Increase buyer leverage thru understanding of cost drivers • Increase project profitability thru better price acquisition • Increase lending potential thru price benchmarking • Optimize procurement schedules	Quarterly PDF files delivered by email in PowerPoint format (4 editions/year) Full analyst support via email for questions pertaining to report coverage	Views of FOB China and DDP U.S. pricing and additional E.U. and U.S. regional market insights where applicable
Supply, Technology & Policy Reports (STPR) 3. PV modules STPR 4. Energy storage systems STPR	Comprehensive evaluation of production capacity expansion Detailed analysis of industry technology roadmaps Extensive evaluation of policy impacts to supply/demand		• Increase project profitability by leveraging industry incentives • Establish security of supply through trade policy understanding • Understand project performance implications for new technology adoption		Regional manufacturing buildups, technology roadmaps, and policy updates for China, India, U.S., E.U., and other regions where applicable
Supplier Market Intelligence Program (SMIP) 5. PV modules SMIP 6. Energy storage systems SMIP	Comprehensive insights into PV module and battery cell manufacturers, ESS integrators, and electrolyzer manufacturers Complete supplier profiles with current and projected production capacity and technology roadmaps In-depth analysis of supplier technology positioning and capacity trajectories		• Benchmark supplier capabilities to aid in AVL development • Compare supplier technology positioning to manage product risk/product reliability • Evaluate supplier capacity buildout to secure supply chains		Profiling of multi-regional suppliers and technology leaders applicable to U.S., E.U., and global export markets

The Problem…

Geopolitical forces are inducing structural changes to value chains supporting the energy transition, complicating procurement strategies and jeopardizing profitability

- Western markets are working diligently to **de-risk supply chains** overly dependent on China thru localization of production capacity
- **Global overcapacity** is developing, though traditional free-market response is instead being modified thru **national trade policies**
- Breakneck pace of supply expansion comes with **equally aggressive pace of technology advancement** in the PV, and energy storage system (ESS) sectors
- **Suitability and security of supply** have become top of mind for industry stakeholders up and down the value-chain
- The importance of supplier evaluation and monitoring has never been higher as **a flood of new entrants** hits the market
- **Project profitability** risks abound as **project delays and volatile pricing** continue to plague the market

Regional production capacity (GW)



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