



Europe's battery moment: The long game in energy security starts with accelerating deployment now

Kostantsa Rangelova¹  and Sonja Risteska²

Abstract

Battery storage has reached a cost and performance tipping point and is transforming power grids worldwide. Lithium iron phosphate batteries have become the dominant technology for grid storage, sharply reducing costs while improving safety and extending project lifetimes. Sodium-ion batteries could drive the next major cost reduction, particularly as rising lithium prices strengthen their business case. Yet while global deployment is accelerating, Europe is falling behind leaders such as Australia, China and the US. Faster battery deployment would help Europe revive solar growth, reduce price volatility and capture more value from domestic renewable electricity. Europe should accelerate deployment of mature technologies with limited short-term energy security risks, while using targeted investment in domestic science, engineering and high-tech manufacturing to manage the more critical long-term security risks. It should especially focus on areas where it can build strategic advantage and lead globally, such as battery recycling and circular value chains.

Keywords

BESS, Battery storage, Solar, Clean-energy flexibility, Clean energy, Grid security, Import dependence, Energy security, Electricity prices

Introduction

As of 2026 batteries have reached the cost and technological maturity necessary to revolutionise power grids and unlock clean power growth at an unprecedented scale. The past five years of rapid cost and technological improvements have driven a profound

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transformation, establishing lithium iron phosphate batteries as a disruptive technology that has reached a critical tipping point. Now deploying at a meaningful scale globally, such batteries are fundamentally rewriting the economics of renewable energy. This shift has been so rapid that policymakers and energy executives relying on assumptions from even just a few years ago are already disconnected from the current market reality.

Relying on outdated technology assumptions risks missing a critical opportunity, especially for the EU power market. The EU power grid is already rich in renewable electricity thanks to the strong growth of wind and solar, which generated more electricity than all fossil sources combined for the first time in 2025 (Petrovich 2026, 6). Affordable batteries are an essential ‘clean flexibility’ tool (Ember n.d.a), enabling these cheap, homegrown sources of electricity to be more efficiently harnessed. They reduce the need for expensive fossil back-up power and help to keep the power grid more stable and secure by providing frequency and voltage control.

Yet, EU battery deployment remains in its infancy compared to the situation among leaders such as Australia, Chile, the US and China, with nearly half of EU grid-scale batteries concentrated in just two countries (Italy and Germany) (Petrovich 2026, 23). Even in a regional leader such as Italy, batteries met just 3% of early evening demand in 2025, mirroring California’s market back in 2021. While the EU is currently lagging, battery deployment could scale exponentially once market conditions align, as the California market has demonstrated: battery contributions to evening demand there have surged from 3% in 2021 to 22% in 2025. Europe faces a strategic choice: capitalise on this momentum to catch up rapidly, or risk falling decisively behind as other markets continue to accelerate.

The global battery industry has reached a tipping point

The price of batteries saw a sharp drop in 2025, which was the culmination of over a decade of falling prices. This helped them reach a tipping point that has fundamentally changed the economics of grid-scale batteries.

The global weighted average price of battery packs for stationary storage applications fell by 45% year on year in 2025, bringing the cost down to just \$70/kWh (see Figure 1). As a result, prices are now less than half of what they were in 2023, when prices stood at about \$160/kWh.

Lithium iron phosphate batteries have recently emerged as the dominant technology for stationary storage applications, accounting for over 80% of new batteries deployed globally in 2024 and 2025 (Volta Foundation 2026, 193). Their greater safety performance, longer cycle life and lower cost than previous chemistries have improved the economic and operational viability of battery storage. The average global storage duration has also increased from 1.8 hours in 2020 to 2.5 hours in 2025 (Volta Foundation 2026, 189), with more projects now extending to 6–8 hours (*BloombergNEF* 2025), and even to as long as 11+ hours (Murray 2026). Now, with rising lithium prices, sodium-ion batteries could bring the next technological step up. While still very early on their cost

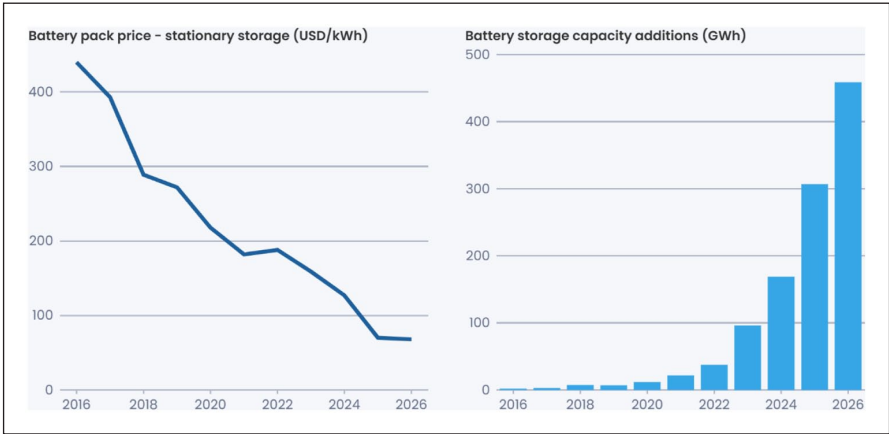


Figure 1. Global battery prices and installations (2016–26).
Source: **EMBER** based on *BloombergNEF* 2025. Reproduced with permission.
Note: Volume-weighted average prices in 2025 in US dollars. Prices for 2026 are the authors’ own estimates; 2026 capacity additions are *BloombergNEF* projections.

learning curve, they could become cheaper and even safer (Mashfy et al. 2026, 23), and they use abundant and low-cost elements such as sodium and aluminium.

As costs have plummeted and technology has improved, overall deployment has naturally surged, reaching 307 GWh in 2025.

Dispatchable solar at just \$76/MWh with low-cost equipment from China

On average, the cost of battery storage in Europe in 2025 was largely in line with the global average but nearly three times more expensive than in China (IRENA 2026, 57), reflecting local content requirements, tariffs and higher installation costs. However, as of the end of 2025, markets importing battery equipment from China without high tariff exposure, including a European country such as Italy, could achieve a full project cost of just \$125/kWh (Rangelova and Jones 2025, 7). At this cost for storage, the blended levelised cost of electricity from solar paired with enough batteries to shape it into a dispatchable profile would be \$76/MWh, just \$33/MWh more than solar alone (see Figure 2) and well below the marginal cost of coal and gas generation, which often exceeds \$100/MWh (Ember n.d.c). Apart from cheaper equipment costs, longer lifetimes, higher efficiencies and lower financing costs—thanks to clearer revenue models such as auctions—are key factors for achieving such low blended levelised electricity costs.

Crucially, importing cheaper battery equipment from China still keeps a large portion of the project’s value in the local economy. Around 40% of the total project cost, or about \$50/kWh out of \$125/kWh, is spent on engineering, civil works, grid connection, and other engineering, procurement and construction activities to turn the core

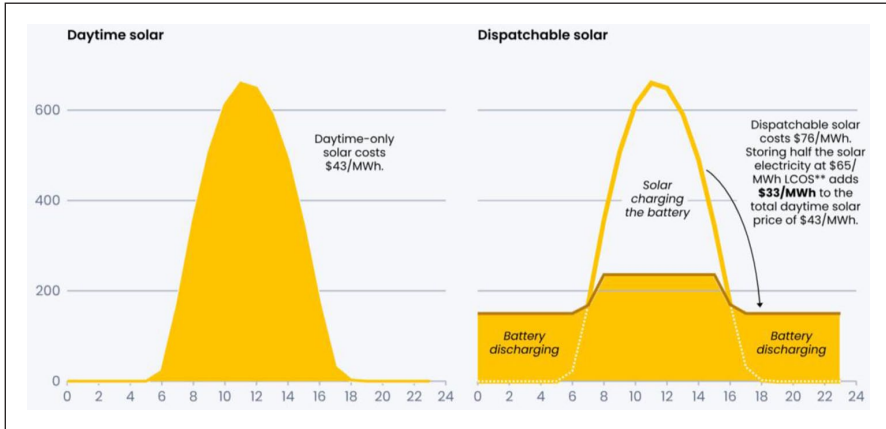


Figure 2. Example hourly solar profile without and with battery, in kW.

Source: Rangelova and Jones 2025, 16. Reproduced with permission. **EMBER**

Note: Solar profile is based on an average day in Rajasthan, India with 1,000 kW (direct current) fixed-axis solar photovoltaics, using data from the Photovoltaic Geographic Information System of the Joint Research Centre of the European Commission. The \$65/MWh levelised cost of storage is based on Ember's price assessment for October 2025 for utility-scale long-duration BESS projects outside of the US and China, using core equipment from China.

equipment into an operational Battery Energy Storage System (BESS) project. This is without accounting for the economic value generated by the BESS project after it becomes operational.

The economic case for batteries is already strong in the EU

In the EU, the economic case for battery storage has become increasingly attractive over the last three years (Petrovich et al. 2024) amid the increasing frequency of negative prices and widening price spreads within the day. In particular, batteries are a true game changer for Europe's solar industry, as they can counter the slowing deployment and unlock the next stage of growth.

Many EU countries are already experiencing very high midday shares of solar power, accounting for over 50% of their noon demand (see Figure 3). While the EU's well-interconnected grid and other flexibility solutions have historically helped maximise solar utilisation during daytime hours, the current high solar penetration at midday has introduced significant structural challenges. These challenges include negative wholesale prices, increased curtailment of clean energy, and a weakening business case for solar due to cannibalisation and falling capture rates—the price received for solar electricity compared to the baseload price.

The consequences of failing to address these flexibility needs are beginning to manifest in solar deployment trends. In 2025 EU solar deployment actually fell by 0.7%, contracting for the first time in a decade to 65.1 GW installed (SolarPower Europe 2025).



Figure 3. Average solar share of electricity demand by hour of the day during the peak month by country, %.

Source: Fulghum et al. 2026. **EMBER**

Note: Peak month is the month with the highest solar share in 2025. World and China hourly data is estimated based on representative load curves, scaled to the monthly average share.

Squeezing more solar into the midday power mix in Europe would be possible with a stronger focus on demand response, including dynamic tariffs and smart electrification and other ‘clean flexibility’ tools (Ember n.d.b). However, delivering a large portion of that additional solar into the evening is the key to unlocking a new wave of accelerating solar growth at scale. New solar projects paired with batteries also have a considerable competitive advantage as they can capture more of the higher evening prices.

The EU is falling behind on battery deployment compared to other regions

Despite the attractive business case, battery deployment in the EU relative to its solar generation growth was significantly below the global average in 2025.

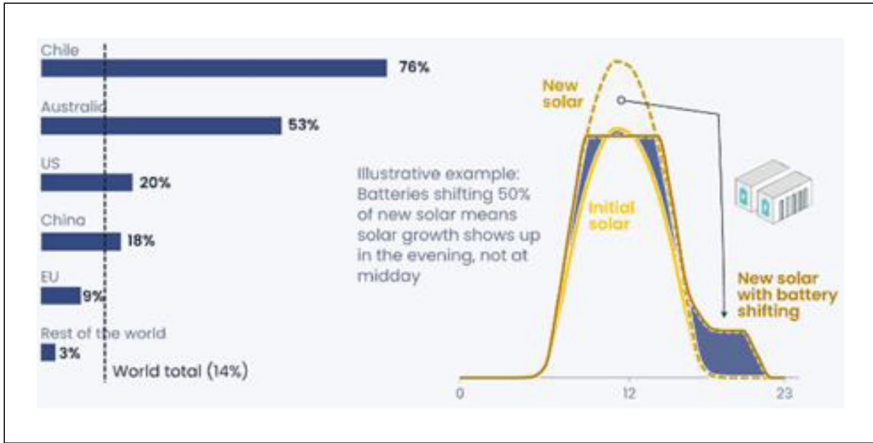


Figure 4. Share of new solar generation that can be shifted using new battery storage.

Source: Fulghum, N., Suarez, W., & Altieri, K. 2026. Reproduced with permission. **EMBER**

Note: Shifting solar refers to the theoretical amount of the average daily solar generation added in 2025 that can be absorbed by battery capacity and redistributed to a different time.

The utility-scale battery capacity installed in the EU in 2025 was only large enough to absorb 9% of the new daily solar generation added in that year (see Figure 4). This falls drastically short of the situation in leading markets such as Australia and Chile, which added enough new utility-scale battery capacity to store more than 50% of the new daily solar generation that each added in 2025. Europe is thus a long way from the 50% mark—the battery-to-solar ratio that would mean that solar growth no longer shows up as midday generation, but can instead meet evening electricity demand.

Battery-leading markets such as Australia are already seeing lower price volatility (Fulghum et al. 2026, 47), with batteries helping to cut evening peak spot prices in the fourth quarter of 2025 to around AU\$100/MWh, less than half the price in the fourth quarter of 2024, and pulling average wholesale prices down 44% year on year to AU \$50/MWh.

Battery deployment can scale very quickly once market conditions align

Batteries are a modular technology that can be deployed very quickly, unlike large infrastructure projects such as gas power plants. A typical battery project can become operational within 12–18 months of permitting, and even within months (Kumanov 2026) of securing financing in some cases.

California offers a leading example of how quickly batteries can become a meaningful part of a large power system. In September 2025 batteries supplied 22% of California’s evening peak electricity (see Figure 5). Just four years before, in September 2021, that contribution was just 3%—similar to the level Italy could supply in September 2025

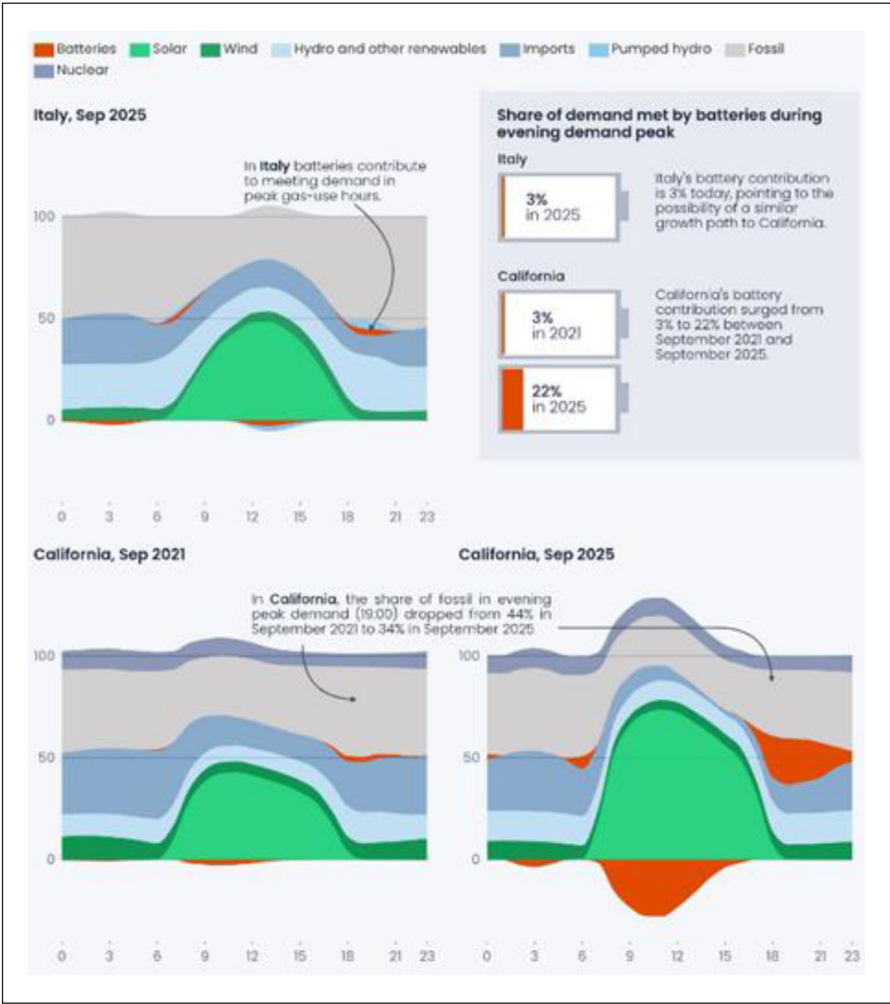


Figure 5. Share of demand met in Italy and California in September, hourly average, by source, in %.

Source: Petrovich 2026, 25. Reproduced with permission. **EMBER**

Note: Negative shares for batteries and pumped hydro indicate charging from the grid.

(Petrovich 2026, 24). If Italy adopts a similar growth path, its battery storage landscape could resemble California’s current state within just four years.

Bulgaria offers another example of fast growth, which is supported by government investment and fast permitting. By the end of 2025, 1.4 GW of BESS capacity had been installed (Electricity System Operator EAD 2026, 3), putting the country just behind Germany and Italy in terms of installed capacity, despite having a much smaller power system. Italy had a comparable 2 GW of battery capacity installed as of the end of 2025

(Petrovich 2026, 24), but its typical daily peak load stands at around 40 GW compared to just 6 GW for Bulgaria. In the five months to May 2026, installed battery capacity in Bulgaria more than doubled to more than 3 GW (Todorović 2026)—roughly half the typical peak load in the country.

The EU's strategic choice: deploy now, specialise where it can lead

As more countries capitalise on the breakthrough in cheap battery storage, Europe faces a strategic choice: accelerate deployment now and catch up rapidly, or risk falling decisively behind.

Central to this choice is the growing concern that fast deployment now would require Europe to become heavily dependent on imports from the few countries that manufacture these technologies, especially China. These concerns are real—Europe has a sizable battery manufacturing industry (Harrison and Rosslowe 2026, 12), but it remains strongest in final assembly and heavily dependent on imports for sub-components and processed and raw materials. The security and geopolitical risks associated with this dependency are reflected in the warning from European Commission President Ursula von der Leyen that trade ‘interdependencies’ can be ‘leveraged and weaponised’ (Guillot 2025). However, import dependence in clean technologies is not simply a case of replacing a fossil-fuel dependency with a new one (see Figure 6). It is fundamentally different and calls for a different approach to energy security.

For batteries and other clean technologies, imports create a stock of infrastructure. Once installed, this lasts for years and continues to deliver value. Fossil-based energy systems, by contrast, rely on continuous imports of single-use fuels that need constant replacement to maintain operations.

This means that accelerating battery deployment, even with a high import dependence, carries a relatively limited short-term risk. A supply disruption may slow the pace at which new infrastructure is added, but it does not stop the existing battery stock from operating.

The longer-term risk is different. Europe cannot afford to lose capacity in science, engineering and high-tech manufacturing. It should focus on areas where it can build durable specialisation and strategic advantage. Battery recycling is especially important because it will allow Europe to recover the materials embedded in imported infrastructure—made-in-Europe requirements for battery components are gradually being added to public auctions and procurement under the recently announced Industrial Accelerator Act (European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs 2026). As the installed battery stock grows, so too does the future pool of recoverable materials, with up to 90% of the lithium being recoverable. Sodium-ion batteries are another potential area for development, as the supply chain, while currently dominated by China, has yet to reach scale.

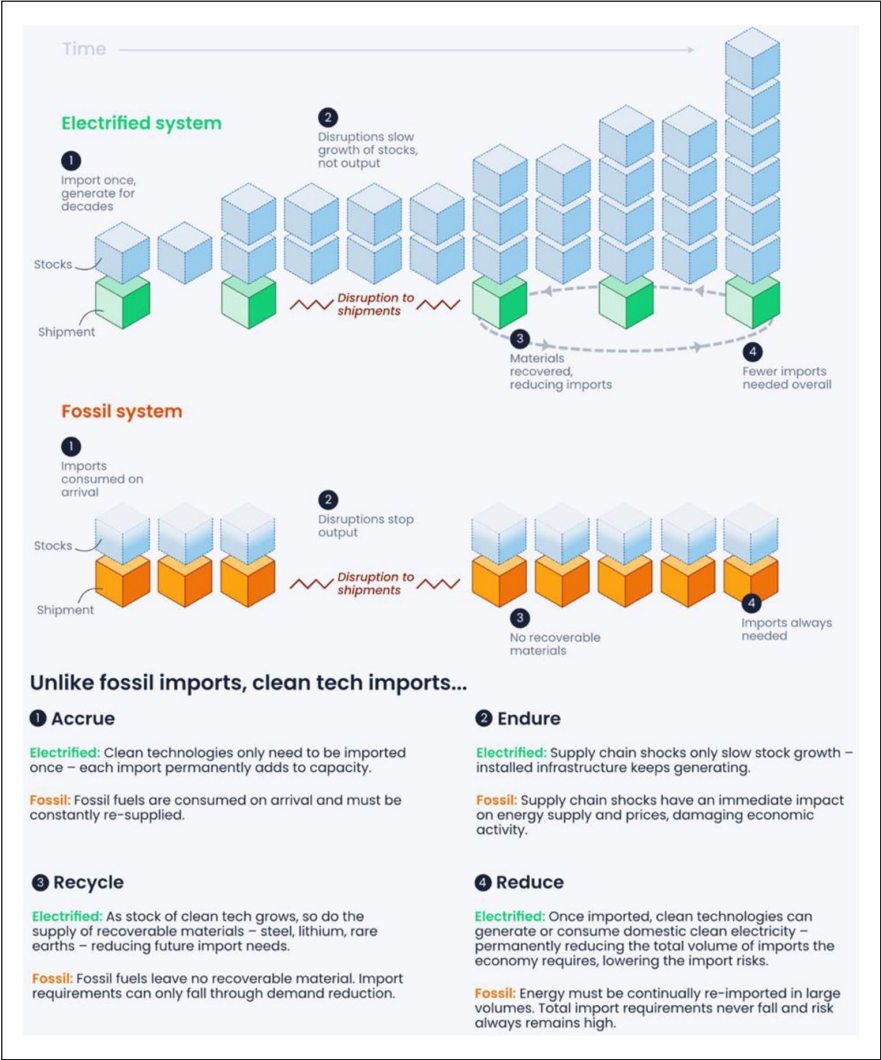


Figure 6. A comparison of imports in an electrified system compared to a fossil system.
Source: Harrison and Rosslowe 2026. Reproduced with permission. **EMBER**

Building this specialisation will take time. But the risk is not immediate. Europe should therefore deploy storage at speed today, without waiting for full supply-chain independence, while at the same time building its clean-energy industries for tomorrow. This will enable the timely build-out of strategic infrastructure at low cost, while also retaining a considerable part of the project value locally though delivery and system integration.

Conclusion and policy recommendations

Cheap battery storage is essential for a competitive, efficient and stable clean power system. Europe needs to catch up with leading markets on battery deployment, while keeping costs low. Europe can import low-cost battery equipment now without locking itself into fossil-style dependency, provided it manages the long-term challenges through targeted specialisation, recycling and local capacity-building.

Accelerate battery deployment now

Batteries are now cost-competitive and mature enough to scale without generous subsidies. The EU should focus on creating a stable, low-risk policy environment that gives investors confidence, lowers financing costs and allows batteries to compete fairly as a clean flexibility asset.

This should start with clear, ambitious and measurable battery deployment targets, supported by indicative milestones and regular assessments beyond 2030 as part of a broader EU strategy for ‘clean flexibility’ (Petrovich et al. 2024, 23). Member states should reflect these ambitions in their national energy and climate plans, helping to coordinate public and private capital around a credible long-term trajectory.

The EU should also make it easier for battery operators to access markets and earn revenues from multiple services, including capacity markets, frequency response and other grid services. This means removing restrictive participation rules, simplifying grid connection processes, accelerating access in congested areas, and including storage in spatial planning and permitting.

Competitive auctions could further reduce investment risk by giving battery operators a route to guaranteed revenue streams, while ensuring they compete on an equal footing with other flexibility asset operators. Lower risk means lower financing costs, helping to make battery storage cheaper for the system as a whole.

Build up domestic stockpiling to protect against supply disruptions

The EU should put in place a coordinated strategic reserve of the critical components and materials used in batteries. The EU should assess the feasibility of establishing strategic stockpiles of components such as power conversion systems, battery-management systems, cells, power electronics and other essential components where supply chains remain highly concentrated or exposed to geopolitical risks. Such a framework would enhance security of supply, provide a buffer against market disruptions and support the continuity of deployment during periods of shocks in the supply chain. Any stockpiling mechanism should be proportionate, regularly reviewed, and aligned with broader objectives under the Critical Raw Materials Act and European industrial resilience policies, as well as carried out jointly by all EU member states.

Apply clear and targeted local-content criteria in public support schemes, aligned with domestic manufacturing objectives and national security concerns

When earmarking EU funding, whether for public procurement, auctions or other types of support schemes, EU regulation should apply clear and transparent ‘made in the EU’ requirements, as envisaged under initiatives such as the Industrial Accelerator Act. Crucially, these criteria need to align with clear and measurable targets for battery manufacturing that address the share of the BESS capacity expected to be supplied by European manufacturing and be calibrated against a clear assessment of EU manufacturing capabilities across the BESS value chain.

A key priority should be distinguishing scaling up genuine manufacturing from assembly, which limits technological spillovers and does not strengthen the European industrial base. A robust made-in-the-EU definition should therefore be based on (i) explicit value-added thresholds (e.g. at least 50% of ex-works value generated in the EU), (ii) component-level substantial transformation aligned with EUR.1 origin principles,¹ and (iii) the exclusion of pass-through assembly or repackaging activities.

Schemes such as public procurement or capital expenditure support should focus on prioritising genuine EU manufacturing, rewarding firms that invest in European production capacity, engineering and system integration. Finally, support schemes should be calibrated against a clear assessment of EU manufacturing capabilities across the BESS value chain to ensure funding effectively drives scale-up and industrial competitiveness.

For security-critical components, made-in-the-EU requirements should be more targeted and risk based. Priority should be given to the connected and controllable parts of battery systems, such as inverters, power conversion systems, energy management systems and control units, given their roles in grid interaction, data exchange, software control and remote access. These should be treated differently from less connected components such as cells.

A proportionate approach, aligned with EU cybersecurity and industrial policy rules and updated through periodic risk assessments, would strengthen system resilience while supporting strategic European capabilities in the battery storage sector.

Build up Europe’s domestic recycling capacity

The EU must prioritise the rapid scale-up of domestic battery recycling capacity as a core pillar of its industrial, energy and circular economy strategy. As current capacity remains significantly below future needs, at only around 10% of that required by 2030, the EU should accelerate investment and de-risk projects through targeted financial support for both pre-treatment and advanced material recovery facilities. This should be followed by

streamlining of permitting and logistics, including the facilitation of intra-EU transport for end-of-life batteries and production scrap. The Union should also bring the recycling capacity into European industrial ecosystems, ensuring proximity to battery manufacturing and deployment hubs. Furthermore, structural barriers, such as high energy costs and limited access to finance for recyclers, should be addressed to build up this industry in the locations where batteries are deployed. Scaling domestic recycling capacity will be essential to secure access to critical raw materials, reduce import dependencies, and enable a competitive and circular European battery value chain.

Ensure tech transfer through joint ventures

While attracting manufacturing investment is important, long-term industrial resilience depends on developing domestic capabilities across the value chain rather than simply hosting production facilities. Using the Industrial Accelerator Act, the EU should support joint ventures and industrial cooperation arrangements that facilitate the transfer of technology and skills to European manufacturers and workers. Joint ventures have often been used when one region or country wants to attract a strategic industry to its domain in order to accelerate capability building and industrial development. Rewarding projects that demonstrate meaningful contributions to technology transfer, the building up of workforce skills, research and development in that sector, and the creation of enduring industrial ecosystems within Europe could be achieved by providing access to public funding, accelerated permitting and other benefits.

Strengthen Europe's domestic innovation space, with a special focus on next-generation technologies such as long-duration energy storage

Europe should reinforce its domestic innovation ecosystem by increasing support for next-generation technologies, particularly new battery technologies such as sodium-ion and long-duration energy storage. Lithium ion will remain central to near- and mid-term deployment, but a diversified technology base will be essential for a decarbonised and decentralised energy system. To secure its technological leadership, EU support should focus on bridging the gap between research and industrial scale-up. This means funding demonstration projects, pilot manufacturing and first-of-a-kind commercial deployment, especially for technologies that reduce reliance on critical raw materials such as sodium-ion. Existing financing instruments, such as Horizon Europe, the Innovation Fund and the European Investment Bank, provide a strong base, but more targeted support is needed to help promising technologies become commercially competitive.

However, breakthrough technologies still face major barriers to scaling up and commercialisation, particularly the difficulty of competing with intense price pressure from other markets. Future support should focus on bridging the gap between research and industrial deployment, ensuring technologies developed with European funding are tested, manufactured and commercialised in Europe, while becoming competitive in terms of price and value. This will require supporting early-stage manufacturing before

projects are profitable. A greater appetite for risk would strengthen the pipeline from lab innovation to industrial scale, helping Europe to build competitive advantages in next-generation clean technologies rather than relying on imports.

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Note

1. EUR.1 origin principles refer to the principles applied for establishing the compliance of a specific product with the applicable rules of origin to qualify it as originating in the EU. These rules establish that the product is fully or in large part produced within the territory and specifies the operations deemed insufficient to qualify, such as simple packaging or labelling.

References

- BloombergNEF. (2025). Global energy storage boom: Three things to know. 21 October. <https://about.bnef.com/insights/clean-energy/global-energy-storage-boom-three-things-to-know/>. Accessed 11 June 2026.
- Electricity System Operator EAD. (2026). *Statistical pocketbook 2025*. <https://www.eso.bg/file-Obj.php?oid=5907>. Accessed 11 June 2026.
- Ember. (n.d.a). Batteries and energy storage. <https://ember-energy.org/focus-areas/batteries-and-energy-storage/>. Accessed 11 June 2026.
- Ember. (n.d.b). Clean flexibility. <https://ember-energy.org/focus-areas/clean-flexibility>. Accessed 11 June 2026.
- Ember. (n.d.c). European electricity prices and costs. <https://ember-energy.org/data/european-electricity-prices-and-costs/>. Accessed 11 June 2026.
- European Commission, Directorate-General for Internal Market, Industry Entrepreneurship and SMEs. (2026). Proposal for a Regulation on establishing a framework of measures for accelerating industrial capacity and decarbonisation in strategic sectors (Industrial Accelerator Act). COM (2026) 100, 4 March. https://single-market-economy.ec.europa.eu/publications/industrial-accelerator-act_en. Accessed 11 June 2026.
- European Commission & European Investment Bank. (2024). European Commission and EIB announce new partnership to support investments in the European battery manufacturing value chain. Press release, 3 December. <https://www.eib.org/en/press/all/2024-484-european-commission-and-eib-announce-new-partnership-to-support-investments-in-the-european-battery-manufacturing-value-chain>. Accessed 16 June 2026.
- European Innovation Council. (2026). STEP scale up. https://eic.ec.europa.eu/eic-funding-opportunities/step-scale_en. Accessed 16 June 2026.

- Fulghum, N., Suarez, W., & Altieri, K. (2026). *Global electricity review 2026*. Ember. 21 April. <https://ember-energy.org/latest-insights/global-electricity-review-2026>. Accessed 11 June 2026.
- Guillot, L. (2025). Von der Leyen touts new plan to break reliance on China critical materials. *Politico*, 25 October. <https://www.politico.eu/article/ursula-von-der-leyen-new-plan-break-china-critical-materials/>. Accessed 11 June 2026.
- Harrison, T., & Rosslowe, C. (2026). *A clean break: Leaving fossil volatility for clean tech security*. Ember. 10 June. <https://ember-energy.org/latest-insights/a-clean-break-leaving-fossil-volatility-for-clean-tech-security/>. Accessed 11 June 2026.
- IRENA. (2026). *24/7 renewables: The economics of firm solar and wind*. Abu Dhabi. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2026/May/IRENA_TEC_24-7_renewables_2026.pdf. Accessed 11 June 2026.
- Kumanov, G. (2026). Enery launches CEE's largest 600 MWh BESS in Bulgaria. *SeeNews*, 7 May. <https://seenews.com/news/enery-launches-cees-largest-600-mwh-bess-in-bulgaria-1294285>. Accessed 11 June 2026.
- Mashfy, M. M., Alvy, T. A., Hossain, N., Haque, M. A., Mohsin, F. T., Sharmin, T., & Nasim, M. (2026). Sodium ion batteries: A sustainable alternative to lithium-ion batteries with an overview of market trends, recycling, and battery chemistry. *Next Energy*. doi:10.1016/j.nxener.2025.100478.
- Murray, C. (2026). '11.5-hour LDES win moves us into new space for batteries', says BW ESS. *Energy-Storage.news*, 27 February. <https://www.energy-storage.news/bw-ess-11-5-hour-ldes-win-moves-us-into-new-space-for-batteries/>. Accessed 11 June 2026.
- Petrovich, B. (2026). *European electricity review 2026*. Ember. 22 January. <https://ember-energy.org/latest-insights/european-electricity-review-2026/>. Accessed 11 June 2026.
- Petrovich, B., Fox, H., & Rosslowe, C. (2024). *EU battery storage is ready for its moment in the sun*. Ember. 26 September. <https://ember-energy.org/latest-insights/eu-battery-storage-is-ready-for-its-moment-in-the-sun/>. Accessed 11 June 2026.
- Rangelova, K., & Jones, D. (2025). *How cheap is battery storage?* Ember. 11 December. <https://ember-energy.org/latest-insights/how-cheap-is-battery-storage/>. Accessed 11 June 2026.
- SolarPower Europe. (2025). New report: EU hits 2025 solar target but market contraction puts 2030 goal at risk. 11 December. <https://www.solarpowereurope.org/press-releases/new-report-eu-hits-2025-solar-target-but-market-contraction-puts-2030-goal-at-risk>. Accessed 11 June 2026.
- Todorović, I. (2026). Bulgaria surges to world's no. 1 in battery systems share. *Balkan Green Energy News*, 26 May. <https://balkangreenenergynews.com/bulgaria-surges-to-worlds-no-1-in-battery-systems-share/>. Accessed 11 June 2026.
- Volta Foundation. (2026). *2025 annual battery report*. <https://volta.foundation/battery-report-2025/>. Accessed 11 June 2026.

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