

Fostering the global leadership of the European battery industry in the face of the Inflation Reduction Act and other recent challenges

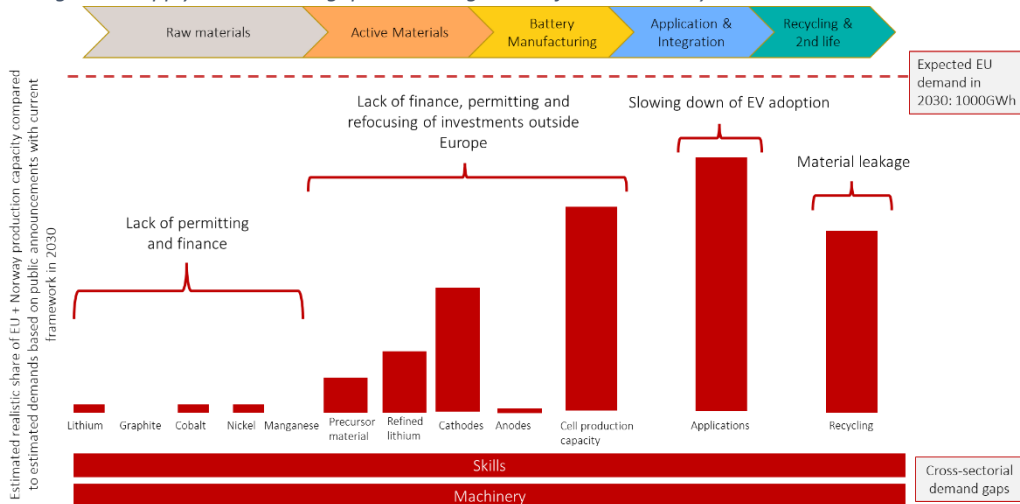
Section I: Europe’s battery industry under pressure – a ‘needs assessment’

Thanks to strategic and concerted efforts by the Commission, Member States, the European Investment Bank and industrial partners coordinated by EIT InnoEnergy¹, the **European Battery Alliance (EBA) continued to make progress in 2022**. With the EBA playing a key enabling role in delivering on the 2018 strategic action plan on batteries², Europe’s battery industrial network grew from 750 to 800 members along the entire value chain, and key milestones for Europe’s battery ecosystem in 2022 were:

- the rise in announced lithium-ion gigafactories from 26 to 30, i.e. 69 GWh of installed capacity;
- the rise in the share of battery electric vehicles (EV) sales from 21% to 28%, while passing the 50% mark in some Member States, such as Germany and Sweden;
- the launch of several new EV models by Europe’s automotive industry, including more financially accessible ones that allowed covering a larger part of the market;
- the political agreement reached on the new EU Battery Regulation, which will enter into force in Q1-2023, giving regulatory certainty to the industry on batteries’ sustainability standards.

At the same time, **Europe’s battery industry continues to suffer from supply and demand gaps especially in the up- and midstream sector**, as summarised in Figure 1. For instance, while Europe’s demand for battery materials is set to significantly increase in this decade, the EU is currently responsible for only 1% of global battery raw materials production, and highly relies on imports of all key battery raw materials. This includes up to 100% of its needs for refined lithium. Other gaps consist in cross-sectoral structural factors such as **limited access to skilled workers, manufacturing equipment and funding**. Funding is limited *inter alia* for pilot lines, an important step to upscale battery technologies from the lab to large-scale industrial production. Only a few of the announced Europe-headquartered battery-cell production facilities have managed to secure such funding so far. Long lead times and lack of funding also affect the upstream industry, especially ongoing projects to process and refine raw materials.

Figure 1: Supply and demand gaps across segments of the EU battery value chain. Source: EBA250



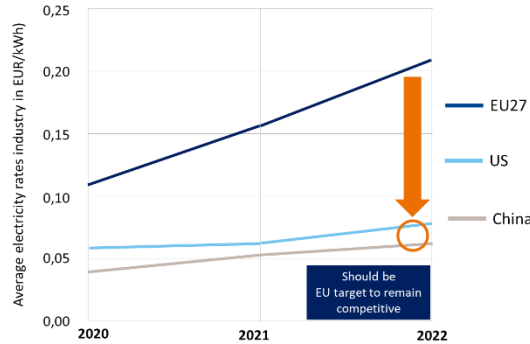
These **structural challenges have been amplified by recent shocks and a new geopolitical landscape**, threatening the progress achieved so far and having lasting effects on the EU’s nascent battery industry. Russia’s war of aggression against Ukraine, rising electricity prices and climbing inflation rates have led to

¹ www.innoenergy.com; and www.eba250.com

² https://eur-lex.europa.eu/resource.html?uri=cellar:0e8b694e-59b5-11e8-ab41-01aa75ed71a1.0003.02/DOC_3&format=PDF

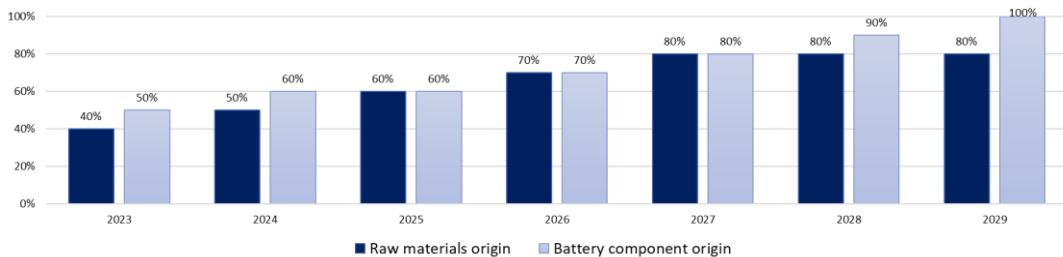
supply chain bottlenecks and disruptions, especially for Europe’s automotive Original Equipment Manufacturers. For instance, limited by shortages of semiconductors and, to some extent, of batteries, Europe has experienced the lowest growth rate of EV sales worldwide. Moreover, *Figure 2* shows that EU electricity prices have been rising far above developments in China and the US, resulting in a **wider electricity price gap** over 2020-2022. As the battery industry is highly energy-intensive, policy action is needed to safeguard internationally competitive energy costs in the EU (*orange circle*).

Figure 2: Development of industrial electricity rates, with EU target to produce batteries at competitive cost. Source: SGL Carbon



More recently, the adoption of the **Inflation Reduction Act (IRA)** by the US in August 2022 is **hindering the EU’s competitiveness and attractiveness for new investments into the battery value chain**. In fact, the IRA provides tax credits to EV suppliers that produce battery components in North America and source battery materials from free trade agreement countries, as well as production tax credits for battery cells and components.³ Thus, the IRA does not only stimulate the production and use of zero-emission vehicles, but also directs focus and investments to the rest of the supply chain further upstream, with targets for raw materials and battery components. In the absence of similar incentives, Europe risks losing its start-ups and champions to the US. *Figure 3* shows that **local content requirements** – i.e. increasing shares of raw materials and battery components that need to be manufactured or assembled in the US as per the IRA – will further protect the growing US battery value chain and spur its localisation towards 2030.

Figure 3: Local content requirement as proposed in the IRA (2023-2029). Source: EBA2050

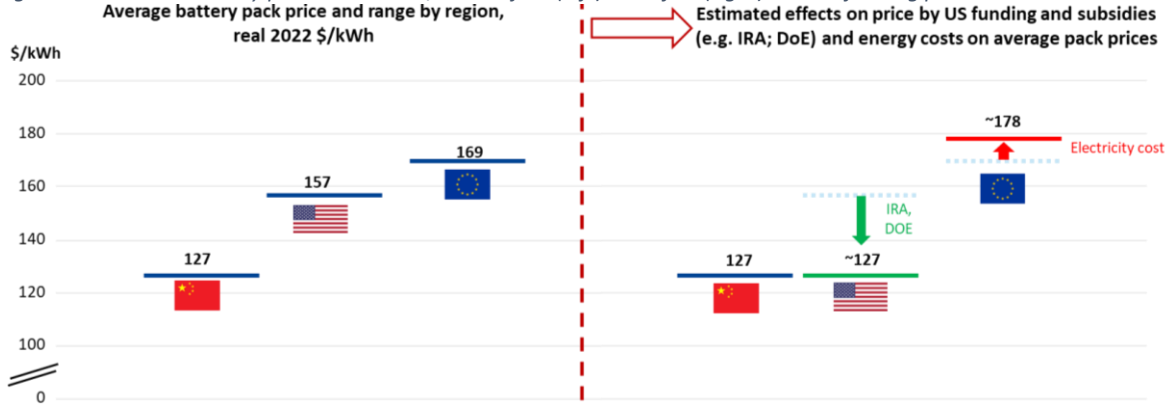


The impact of the IRA and other recent challenges in terms of loss of cost-competitiveness for Europe’s battery industry is summarised in *Figure 4*. In early 2022, the average price of a battery pack in Europe was already 8% higher than in the US and 33% higher than in China (*left*). This reflects the relative immaturity of the EU market as well as higher labour, land and permitting costs – also due to the highest

³ The US’ Congressional Research Service estimates that, combined with the Bipartisan Infrastructure Law and the Chips & Science Act, the **IRA will invest more than USD 135 billion into EV development**, including critical minerals sourcing and processing and battery manufacturing. This includes USD 7.5 billion for the subsidization of clean vehicles, including EV; and USD 127 billion for the subsidization of clean energy production (only partly linked to local content requirements). However, discussions between the EU and the US are ongoing as the EU "continues to seek similar, non-discriminatory treatment of EU clean vehicle producers under the Clean Vehicle Credits of the Inflation Reduction Act. This scheme remains of concern to the EU, as it contains discriminatory provisions which de facto exclude EU companies from benefiting" ([source](#)).

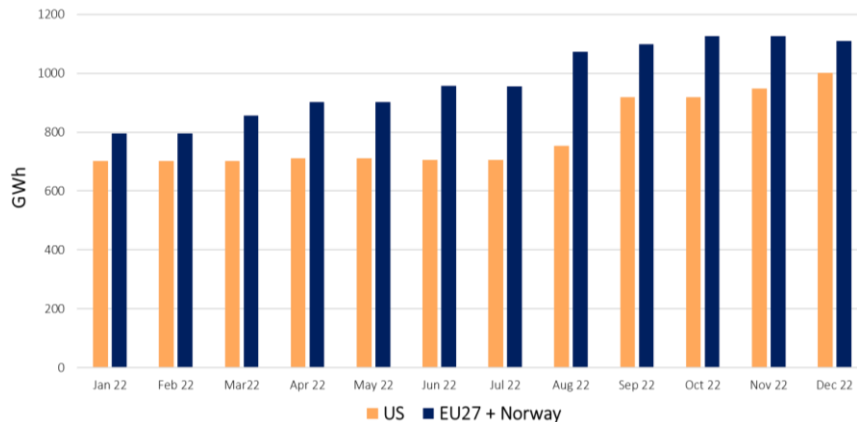
level of Health, Safety, Environment and employment legislation for production worldwide⁴. The effect of the IRA tax credits, grants offered by the Department of Energy (DoE) and tariff policies has been to further lower US-made battery prices, bringing them in parity with China. Instead, the average battery price in the EU has been fuelled by energy costs, adding another 10-12%. This has further **widened Europe’s battery price gap to around 40% compared to the US and China (right)**.

Figure 4: Estimated battery pack cost in USD/kWh before (left) and after (right) the US’ funding policies. Source: BNEF 2022



Overall, **substantial amounts of funding and subsidies outside Europe, together with local content requirements, risk distorting the competition between the EU and global competitors**, particularly the US and China. This will have the effect of withdrawing investments from Europe’s battery industry, while increasing the risk for ongoing EU investments. There is already evidence of Europe falling behind in terms of battery cell developments, as well as of companies delaying or rethinking their investments in Europe to accelerate their US expansion in light of the more attractive investment conditions and incentives to scale up operations⁵. Figure 5 shows that the number of battery cell production sites levelled out in Europe in 2022, while the US announced more battery capacity and gigafactories than Europe. Namely, 242 GWh of battery capacity (+34.3%) were added to the US pipeline since July 2022, while Europe’s increased only by 170 GWh (+16.7%), with Chinese companies being responsible for all new gigafactory announcements.

Figure 5: publicly announced cell production capacity in GWh, in the pipeline for 2031. Source: Benchmark Minerals and EBA250.



⁴ See <https://data.oecd.org/envpolicy/environmental-tax.htm>; <https://data.oecd.org/water/wastewater-treatment.htm>; and https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_762534.pdf.

⁵ For instance, Tesla in Berlin, Northvolt in Heide, and Freyr in Norway (see: www.electrive.com/2022/10/31/energy-prices-may-delay-construction-of-northvolt-drei/; www.freyrbattery.com/news/freyr-battery-announces-plans-for-u-s-gigafactory-in-georgia/; and www.electrive.com/2022/10/11/audi-considers-first-us-plant-to-remain-in-race-for-ev-tax-credits/). This trend is confirmed by a survey in Finland, where some 20% of surveyed companies indicated the intention to shift their investments to the US due to the IRA (https://www.euractiv.com/section/politics/news/us-inflation-reduction-act-may-heavily-impact-finnish-industries/?cx_testId=2&cx_testVariant=cx_1&cx_artPos=2&cx_experienceId=EXLQ9EV18G4H#cxrecs_s).

In summary, the Inflation Reduction Act has been aggravating other recent challenges and is having the following consequences on the European battery value chain:

- I. delayed investments due to uncertainties around EU and national financial support, so far unable to match attractive CAPEX and OPEX incentives deployed by the US and other global competitors;*
 - II. new risks for securing the upstream segment of the EU battery industry, in particular raw and active material, due to the acceleration of the US battery value chain;*
 - III. higher cost-competitiveness of benefitted producers compared to EU ones thanks to international subsidies;*
 - IV. faster innovation progress in the US and other competitors, with companies better able to take projects from pilot to industrial scale and support local competitiveness by bringing this back into design and R&D.*
- The EU thus needs to act urgently to restore its sustainable competitiveness and investment attractiveness.***

Section II: measures to secure Europe's leading position as hotspot for battery investment

Seven concrete measures have been identified via three high-level roundtables with CEOs about specific and established needs of the EU battery value chain in the face of IRA and other recent challenges, carried out by Commission Vice-President Maroš Šefčovič between November 2022 and January 2023⁶. These measures are organised along the four pillars of the Green Deal Industrial Plan⁷ and focus on accelerating and de-risking investments as well as ensuring adequate conditions for strategic European projects. These ideas will feed into the ongoing reflection following the European Council's call on the Commission to make proposals with a view "to mobilizing all relevant national and EU tools as well as to improving framework conditions for investment, including through streamlined administrative procedure".

Pillar I - Improving the EU regulatory framework across the EU battery value chain

Bolstering investments and project delivery across the EU battery value chain requires a fast and targeted adaptation of the current regulatory framework. Administrative bottlenecks apply to industrial projects as well as to the extraction of key battery raw materials – including convoluted and lengthy authorisation procedures that limit the EU's capacity to exploit its domestic resource potential in lithium, graphite and manganese. This stems also from limited administrative capacity and digitalization of – often understaffed and underfunded – competent authorities at national, regional and local level. To reduce investors' uncertainty, these bottlenecks must be addressed, while maintaining high sustainability standards. Upcoming proposals (e.g. the Critical Raw Materials Act and Net-Zero Industry Act) aim to simplify permitting for manufacturing projects for batteries and other clean energy technologies. To bridge the critical time until the adoption of these measures, a short-term solution could be proposed, under Article 122 TFEU, to accelerate strategic projects within the current regulatory framework. At the same time, the EU should leverage the Important Project of Common European Interest (IPCEI) instrument, used in the past to advance the development of a European battery industry. Namely, reopening existing IPCEI's and additional battery IPCEI's would support the EU's capability to take the next step in battery development – such as solid-state batteries and alternative battery chemistries. Improvements of the rules applicable to IPCEIs, including a reduction in the complexity and length of the IPCEI funding process, would also facilitate support to SMEs, industrialization and upscaling of manufacturing capacities.

Proposal 1: Adopt emergency and temporary measures for industrial permitting for strategic projects

- **Action:** allow Member States to override permitting regulations to accelerate permit delivery via fast-tracking, timeline abbreviations and other procedural streamlining like parallel rather than sequential processes. New rules could be inspired by Council Regulation 2022/2577, laying down a framework to accelerate the deployment of renewable energy.

⁶ A [joint statement](#) was released by EBA250 on 14 December 2022, recommending a series of key actions at EU and national level to unlock EUR 100 billion of investments and accelerate projects across the value chain in 2023-2024.

⁷ https://commission.europa.eu/system/files/2023-02/COM_2023_62_2_EN_ACT_A%20Green%20Deal%20Industrial%20Plan%20for%20the%20Net-Zero%20Age.pdf

- **Action:** provide exceptional financial and administrative support to national and local permitting authorities, conditional on the delivery of bottlenecks reduction and faster execution of permitting procedures.

Proposal 2: Adapt the IPCEI framework for SMEs, industrialisation and upscaling

- **Action:** adapt the IPCEI framework for SMEs, industrialisation and upscaling to improve EU competitiveness at scale, also by lifting requirements that block the eligibility of projects and allowing simplified and accelerated approval to match timelines in non-EU countries (e.g. the US).

Pillar II - Accelerating investment and financing across the battery value chain

The availability of public finance is key to de-risk and accelerate private investment decisions, particularly in a nascent industry like the battery one. As public incentives are increasingly provided by competitors to battery manufacturing projects, making the EU market less attractive, urgent rebalancing measures are needed. Available resources have recently been repurposed to support clean technology manufacturing, notably in the context of REPowerEU. This should allow funds managed at EU level (e.g. the Innovation Fund) and national level (e.g. from the Recovery and Resilience Fund) to be allocated to battery projects already in 2023-2024. An adaptation of current state aid rules would enable Member States to ramp up their aid for batteries and other strategic value chains. In parallel, a reprogramming of unspent European Structural and Investment Funds (ESIF) of the 2014-2020 programming period (while respecting the goals of cohesion policy and the territorial allocation of funds) would magnify the positive effects of a relaxation of state aid rules, limit the fragmentation of the internal market, and build up a ‘bridge solution’ towards a future EU Sovereignty Fund financed by EU own resources. Finally, while the EIB’s investments in the up- and midstream sector are currently limited, the EU’s largest financial institution carries a responsibility to set benchmarks for crediting projects in the EU and catalyse private finance. If strategic European projects benefitted from early de-risking through public finance, their timeline would be substantially shorter.

Proposal 3: Prioritize the battery industry, among other strategic clean tech sectors, for the urgent redeployment and reprogramming of existing EU funds as well as the future EU Sovereignty Fund

- **Action:** list the battery industry as priority recipient of existing EU funds, earmark budget lines at EU and national level and implement dedicated calls for action in 2023 to rebalance the EU’s attractiveness as an investment destination for batteries.
- **Action:** list the battery industrial value chain as priority area for the EU Sovereignty Fund.

Proposal 4: Couple revised state aid rules with a reallocation of unspent European structural funds

- **Action:** new state aid rules should allow aid to be deployed faster and better, for example through tax breaks related to the cost of energy or to the cost of employment.
- **Action:** unspent ESIF of the 2014-2020 programming period (around EUR 149 billion) should be re-allocated to business investment support measures and workers’ reskilling in strategic sectors for the transitions. The focus should be on automatic and easy-to-implement instruments such as tax credits for productive reconversions linked to the transitions.

Proposal 5: Leverage financing instruments such as InvestEU and the EIB to catalyse private investments to boost the up- and midstream sector of the battery value chain

- **Action:** incentivise the EIB to earmark funding for investments in raw materials, also by building internal competences, for instance via a dedicated unit responsible for assessing mining projects.
- **Action:** implement EIB products, such as bridging loans and more progressive financial products, to assist the EU battery value chain, also with necessary adjustments of the EIB’s risk profile for investments in this industry.
- **Action:** mobilise dedicated Technical Assistance, including via InvestEU, for administrations and companies to improve data management, permitting, licensing and ESG compliance procedures.

Pillar III - Skills

The availability of skilled workers remains a key issue for Europe's battery industry, and industrial acceleration in the US will entail even starker competition to retain and attract talents. Established in May 2022, the EBA Academy has already committed EUR 1.7 million (out of a total EU grant of EUR 10 million) to develop content, promote the academy, onboard local training providers and hire staff. Future spending will aim at scaling up training provision, with the target of delivering 50,000 trainings (with 350,000 workers indirectly benefitting) by 2023 and 100,000 trainings (with 700,000 workers indirectly benefitting) by 2025. This means bridging one eighth of the estimated gap of 800,000 skilled workers by 2025. Most Member States have identified skills as a priority but have not taken corresponding funding decisions via EU or national programmes to deploy funds for training, upskilling and reskilling in the battery value chain.

Proposal 6: Ramp up workers' training, upskilling and reskilling to meet needs of the battery value chain

- **Action:** Member States should earmark and frontload 2% of ESF+ funds to deploy training programs in the battery value chain in 2023, 2024 and 2025.

Pillar IV – Trade

In the face of Europe's growing competitive disadvantage vis-à-vis global competitors, efforts to localize Europe's battery supply chains are needed to level the global playing field. Production tax credits foreseen by the IRA for battery cells and modules have the same goal but do not take into account sustainability requirements: the main criterion for eligibility is localization of manufacturing in the US, irrespective of the quality of the manufactured battery. As a response, Europe could turn its high sustainability ambitions into a competitive advantage, via a 'sustainable production bonus' boosting the industrial base while enabling the green transition. The requirements of the new EU Battery Regulation (e.g. recyclability and CO₂ footprint of batteries placed in the EU internal market, with a digital battery passport to allow tracking and enforcement) can set the standard. The approach would resemble the free allocation of ETS allowances to the 10% of industrial best performers, upon set benchmarks.

Proposal 7: Accelerate the demand pull for sustainable batteries produced in Europe

- **Action:** condition the EU's support to the battery value chain to clear criteria fostering sustainability or providing a selective incentive to localise in Europe. This could include either:
 - a 'EU value chain bonus', whereby the more manufacturing steps are performed within the EU, measured by the share of value-adding activities performed in Europe, the higher the percentage of subsidies provided. Requirements could include that a certain percentage of materials and components of the battery cell comes from the EU; that the battery cell is produced in the EU; or that key technologies for these products are developed in the EU. The cost of this measure could be limited via adequate criteria for qualifying to the bonus.
 - or a new 'sustainable production bonus' granted to manufacturers that overachieve the goals, or anticipate the provisions, of the EU Battery Regulation or other sectoral sustainability rules. The incentive could take the form of grants for the best performers, progressively ramped up to match Europe's increase of manufacturing capacity⁸.
- **Action:** use **green public procurement** to leverage public demand for batteries and other clean technologies. This could include setting public procurement criteria that incentivize the best performers in terms of sustainability, taking the EU Battery Regulation as a minimum benchmark.

⁸ For instance, a 14 EUR/KWh bonus supporting the most sustainable 200 GWh of manufactured batteries by 2030 – of which 5 GWh in 2024, 10 GWh in 2025, 15 GWh in 2026, 30 GWh in 2027, 40 GWh in 2028, 45 GWh in 2029 and 55 GWh in 2030 – would cost 2.8 bn EUR over 2024-2030, backloaded to the final years via progressively increasing yearly amounts of up to 550 million EUR in 2030.