INSTITUT MOBILITÉS
EN TRANSITION

POLICY BRIEF

N° 02
JUNE 2025

Plan for the emergence, competitiveness, and resilience of an EU battery ecosystem — Leveraging combined use of local content policies and of new public aids schemes

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This policy brief proposes a dynamic, time-calibrated package of instruments aligned with the EU budgetary calendar that blends and binds local content (LC) policies with (i) financial support measures (capacity investment or production aids), (ii) demand-side tools, (iii) material and end of life/eco-design regulations, to accelerate the emergence of a robust European battery ecosystem. These mechanisms are not standalone solutions but mutually reinforcing levers, whose combined impact depends on their coordinated and phased rollout. Their shared goal is to de-risk early investment, bridge competitiveness gaps during industrialization and capacity ramp-up, create stable lead markets, and embed critical parts of the battery value chain in Europe. This approach takes into account the systemic interdependence of the battery value chain, from raw materials to closed-loop recycling, and advances a balanced pathway to secure short-term industrial traction, medium-term scale-up, and long-term industrial sovereignty.

KEY MESSAGES

Europe needs a time-bound, tool-mixed industrial policy anchored in local content that fuses regulatory, financial, and market instruments to secure strategic battery value creation. A priority first move is to define a "Made in Europe" label.

Support needs to cover the entire battery value chain, not just cell production. A durable European battery ecosystem requires targeted support for both upstream (like CAM/pCAM) and downstream segments (such as recycling to produce battery-grade materials). The support measures should be sequenced, starting with cell production and progressively extending to both sides of the value chain.

Temporary, targeted interventions are essential to bridge Europe's competitiveness gap. In the short term, investment aid, production incentives, and innovation funding will enable producers to overcome the industrialization and capacity ramp-up phases. In the long term, payment-for-difference mechanisms can provide lasting purchase certainty, reducing investor risks and facilitating market entry.

Policy implementation has to be progressive with a defined long-term planning. Europe should begin with protective and capacity-building measures, gradually transitioning to standard policy tools that foster a stable, foreseeable lead market.

Prioritize European industrial players in critical segments. For a defined period, policy should focus on establishing strong European companies or allow non-European firms only under strict conditions regarding local content, value-added contributions, and Intellectual Property (IP) transfer, in particular in key areas like CAM/pCAM and closed loop battery recycling.

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1. WHY IS A SHIFT IN POLICY URGENTLY NEEDED?

Europe's battery sector remains structurally fragile and import-reliant, despite bold targets outlined in the Net-Zero Industry Act (NZIA)[1] and Critical Raw Materials Act (CRMA)[2] and, more recently, the Clean Industrial Deal (CID)[3] and the Industrial Action plan for the Automotive sector[4]. The failure of flagship projects such as Northvolt underscores critical gaps across the supply chain, particularly in mid-stream segments like CAM and pCAM.

Meanwhile, China dominates, with 70%+ of global cell production and nearly 90% of critical material refining. Its structural overcapacity distorts global markets and Europe risks becoming a peripheral player without a coordinated, bold, and timely intervention.

To reverse this trend, interventionist but temporary policies, especially local content rules, are essential. These should not be conceived as permanent distortions, but as catalytic enablers designed to accelerate Europe's industrial maturation and secure long-term competitiveness of a critical industry for its sovereignty, security and independence over achieving its environmental agenda.

2. INTRODUCING A "MADE IN EUROPE" CERTIFICATION

The first step to operationalize local content policies is to establish a robust "Made in Europe" label.

Linking local content to strategic EU goals (resource independence, cybersecurity, climate mitigation commitments, circularity on critical resources) is essential to anticipate and tackle potential critiques of protectionism (e.g. WTO compatibility).

In practice, the label should be built on Maximum Non-Originating Material (NOM) thresholds, a measure of how much content can be sourced from outside the EU while still qualifying as 'local'. These can be drawn from the design of Rules of Origin (RoO) in Free Trade Agreement (FTA). Subsequently, there are different options to define the integration of the label into policy tools, certification may include conditions on EU value-added share, origin of processed materials, and manufacturing location, as highlighted in a recent report by Gerpisa[5].

Furthermore, LC valuation approaches need to be defined. For instance, real monitoring of value-added reflects the actual local economic contribution, but it requires extensive reporting: while pre-defined levels of value-added per segment (e.g. 20% CAM in cell) are easier to apply for calculating aid, but risk over- or under-compensating if not properly benchmarked. A suitable option would be to rely on modeled value-added for up-front allocation with real value-added monitoring for ex-post adjustments or audits.

3. A SYSTEMIC STRATEGY BUILT ON FOUR PROGRESSIVE AND SYNERGISTIC PILLARS

A successful strategy combines local content policies with regulatory, financial, and demand-side instruments into a phased framework with a specific timeline applicable to different actors. Effectiveness lies in the timing and synergy between the tools.

Examples of blended measures:

- Capacity investment subsidies conditioned to local value-added or IP access & localization,
- Maximum non-originating material levels applied alongside recycled content requirements,
- Production subsidies to offset temporary non-competitive cost gaps, tied to long-term offtake contracts with committed buyers,
- Local recycled content requirements timely linked to progressive restrictions or bans on exporting black mass (recycled active materials).

The four synergistic pillars of this strategy are illustrated in the diagram on page 3.

3.1. Emergence - Capacity support

Objective: Build industrial capabilities and capacities in cell production and in critical segments, including CAM/pCAM and recycling to battery grade (hydrometallurgy).

This first pillar is already operational and activated by most member states to attract and foster investments and projects in EU countries. Financial support of this kind is unfortunately (i) rarely conditioned to added value or IP localization, environmental or labor criteria, (ii) not coordinated in terms of redundancy and consistency at EU level and (iii) not followed by production aids for example to accompany the project in its early, industrial

1 European Commission. (2024). Net-Zero Industry Act (NZIA). European Commission. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX3%A52023PC0161

2 European Commission. (2024). Critical Raw Materials Act (CRMA). European Commission. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX3%A52023PC0160

3 European Commission. (2024). European Industrial Deal: Towards a Competitive, Green, and Resilient Industry. European Commission. Available at: https://commission.europa.eu

4 European Commission. (2024). Strategic Dialogue on the Future of the EU's Automotive Industry. European Commission. Available at: https://commission.europa.eu

5 Pardi, T., Alochet, M., Jullien, B., & Kuyo, A. (2025). Made in Europe. Local content policy for the European automotive industry. Actes du Gerpisa, Gerpisa, 44. Available at: https://gerpisa.org/node/8350

maturation phase (leading to uncompetitive production the first years of operation).

Temporary, progressive, and support mechanisms to battery cell, pCAM/CAM and recycling players conditioned to progressive LC rules include:

— CAPEX subsidies and Research and Development (R&D) funding attached to production localization and MaxNOM levels,
— Risk-sharing guarantees for early investments, and
— Enhanced financing schemes (including potential EU funds) beyond current state aid frameworks, authorized under approval at EU level, according to the relevancy and consistency of the project considering EU predefined strategic value chain needs and priorities (e.g. non-price criteria in Industrial Decarbonization Accelerator Act)

Progressivity is key: support increases with value chain integration and decreases as industrial maturity grows. Besides, support for Joint Ventures (JVs) should require balanced conditions on IP, governance, and local R&D.

3.2. Competitiveness – Production support

Objective: Offset the temporary cost disadvantage of producing in Europe during the industrial ramp-up.

The production support pillar is new to implement and extremely crucial considering that none of the three industrial players (cell manufacturers, pCAM/CAM producers, recyclers to battery grades) can structurally be immediately competitive against global competition at this stage. This is largely due to significant disparities in energy and labor costs, combined with existing overcapacities outside the EU. These challenges are particularly pronounced during the industrial ramp-up phase, where capacity utilization is low and production waste is high.

Conditions for implementation:

— All mechanisms below are intended to be temporary and degressive, encouraging EU actors to catch up with international competitors. Their evolution over time should reflect the learning curve producers progress on.
— They are designed to be paired with local content rules, ensuring that support for EU producers offsets the higher cost of sourcing local products for their clients (e.g., OEMs for battery cells, battery cell makers for CAM). Compliance with local content rules (e.g. % of value added or other rule) is a prerequisite to benefit from the mechanisms.

Temporary, progressive, and support mechanisms to battery cell, pCAM/CAM and recycling players conditioned to progressive LC rules include either "production subsidies", "OPEX subsidies" or "payments for difference". These three types of production aids are described and analyzed in detail in the appendix and summarized here under.

— Production subsidies (three types of degressive schemes)
  • Alternative 1: Tiered by production volume growth. *Example of progressive numbers suggested for cell production: €25/kWh (0–20 GWh) → €15/kWh (20–50 GWh) → €5/kWh (50–100 GWh), max €1.2bn/company.*
  • Alternative 2: Tiered by production capacity use. *Progressivity and level of aids linked to the plant production ramp-up as a ratio of installed production capacities.*
  • Alternative 3: Tiered over time. *Example of numbers suggested by the cell producers: support is limited to six years, with a sliding scale starting at €25/kWh for years 1-2, then €20/kWh for years 3-4, and €15/kWh for years 5-6.*
  • *Option: a tiered premium scheme based on local value-added level could also be an option, for instance offering €5/kWh for batteries with ≥20% EU value-added, €10/kWh for ≥40%, and €15/kWh for ≥60%*
— OPEX subsidies
  • Similar to the previous measure however yearly reviewed based on variations of key commodity indexes (e.g. EU energy price index or differences in price versus other regions or carbon intensity level or London Metal Exchange (LME) rate for key metals).
  • Can be tiered by production capacity (volume growth or capacity use) or over time.
— Payments for Difference
  • Temporary competitive disadvantages can be offset through payments to European clients (or directly to producers, although this option presents less benefits) committing to mid- to long-term

offtake contracts on volumes (cell producers for pCAM/CAM, OEMs for cell producers) transparently approved by the EU Commission if supported by the EU budget.
- The EU compensates the customer when the price of a European-made battery material or product exceeds a global benchmark, pre-defined by a benchmark of Asian costs and prices on these products.
- They could also be structured as a temporary subsidy on production (on CAM, pCAM and batteries), reevaluated quarterly, semi-annually, or annually, based on key cost factors (energy, materials, labor). They require careful benchmarking, indexation, and legal safeguards to ensure they comply with EU State aid doctrine (proportionality, necessity, minimal distortion) and deliver tangible competitiveness improvements rather than creating permanent dependencies.
- Ultimately, this phased approach allows pCAM, CAM, and battery cell producers to (i) secure lead markets and clients in the medium term, and (ii) offer long-term investment visibility for investors and industrials.

These tools provide visibility and predictability, essential for scaling investment and securing bankable business cases.

3.3. Resilience - Lead market creation

Objective: Secure stable, predictable demand for batteries that are compliant with the "Made in Europe" label.

Securing Lead markets requires to embed incentives around EU content thresholds in demand-side incentives, and programs to stimulate early market demand:

— Public aid schemes (e.g., subsidies tied to local content levels),
— Fiscal policies (e.g., embedded carbon content indexes, green bonuses), and
— Procurement frameworks (e.g., mandates for public fleets or corporate fleet fiscal scheme weighted (discriminated) based on local content level or 'Made in Europe" labelled part of the car fleet).

These initiatives will foster predictable local markets, secure production in Europe and ensure long-term industrial stability.

Importantly, we consider that LC requirements should be complemented by circularity and carbon intensity metrics in end-product labelling tools (for instance see a proposal by T&E, BEUC and IMT[6]) to enhance their acceptability and WTO compatibility (e.g., ≤50 kg CO_2e/kWh by 2030 conditioning access to support and progressively embedded as mandatory thresholds). A recent report by Strategic Perspectives[7] finds that combining LC requirements and sustainability criteria could ensure that by 2035, 81% of new car sales are both "Made in Europe" and powered by European batteries, generating €40.4 billion in value-added and 449,000 new EU jobs.

Potential funding streams to use or activate:

— Significant part of the €1.8 billion under the Innovation Fund for 2026-2027
— Funding from the 2028–2034 Multiannual Financial Framework (MFF) for production support,
— EIB instruments for industrial and recycling projects.
— Potential revenues from a tax on black mass export for the battery recycling sub-sector

3.4. Predictability - Smart regulation

Objective: Reduce legal and administrative uncertainty to attract investment.

Regulatory changes:

— Clarify and harmonize the classification of black mass and end-of-life batteries in the EU.
— Set up a timeline for a black mass export ban (e.g. 2035) to provide visibility. In the meantime, a tax on back mass exports could be introduced to fund support for the sector.
— Streamline cross-border administrative procedures for waste transport within the EU.
— Set rules for eco-design to secure long-term feedstock and safeguard the viability of recycling operations. Key measures may include mandates on minimum "dismantlability", automation-readiness, and the ban of cell designs that hinder dismantling and recovery.

In parallel, measures to secure investments in the battery ecosystem include:

— Streamlined permitting (similar to rules of CRMA's Strategic Projects).
— Simplified reporting and data requirements: focus on a few verifiable indicators and avoid complex instruments impossible to audit and control at global level (e.g. Power Purchase Agreements (PPAs), Guarantees of Origin unrelated to production site).

6 Defining a European eco-score to support automotive industrial policy (2024) Available at: https://www.iddri.org/en/publications-and-events/blog-post/defining-european-eco-score-support-automotive-industrial-policy

7 Strategic Perspectives. (2025). Lead markets: driving net-zero industries made in Europe. Brussels. Available at: https://strategicperspectives.eu/lead-markets/

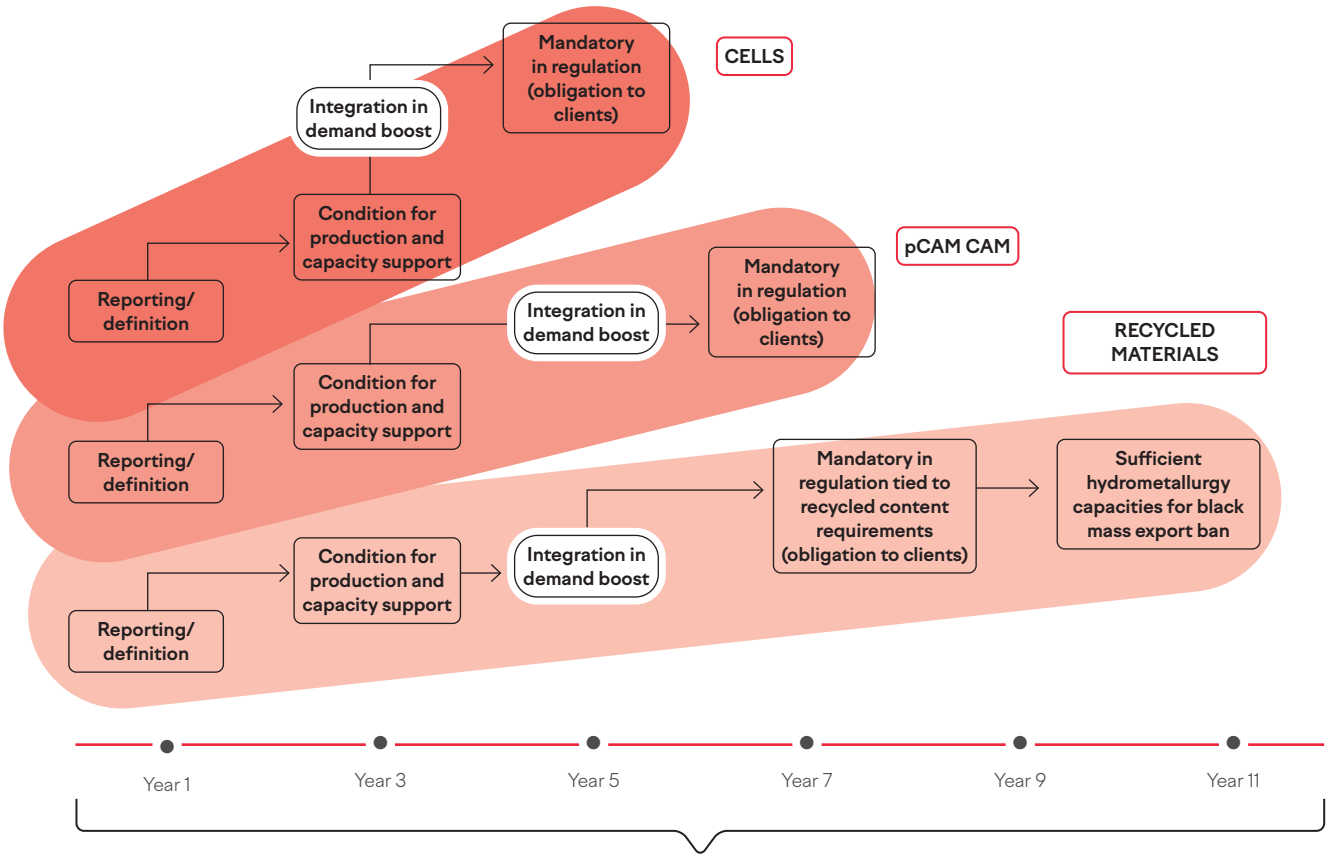
4. PROGRESSIVE POLICY TIMELINE

The measures must be conceived as temporary targeted tools aimed at allowing key players to scale up and gain industrial maturity within a limited timeframe. We not only propose a pragmatic "toolbox" of protective or incentivization measures (not a one-size-fits-all industrial players involved in this supply chain) but rather a coherent set of synergistic tools combined and applied in time with committed stakeholders. It is the progressive articulation between these policy tools that is likely to produce the expected results and maximize impact.

TABLE 1. Overview of LC measures and timeline of implementation

		Medium-term (2026-2030)		Long-term (2030-2034)
Phase	**Immediate Measures Policy Design (2025–2026)**	**Innovation Fund €1.8 bd (2026-2027)**	**Next MFF (2028-2034)**	
Entry Gate 1 – Cell Producers	European Commission design of local content (LC) reporting tools and RoOs, methodology, and obligations to activate the LC lever Introduce LC criteria in public aid eligibility (CAPEX support for capacity + production aids)	Introduce and apply LC criteria into eligibility for public aid (CAPEX + Production aids - see options discussed above) Implement progressive thresholds in demand-boost instruments (e.g. public procurement, fleet schemes) Annual review of LC thresholds based on competitiveness indicators (e.g. energy, material costs)	Maintain or increase LC thresholds within future production incentives Annual review of LC thresholds based on competitiveness indicators (e.g. energy, material costs)	Mandatory LC requirement 50% of value add (Battery Booster Package) or 50% Max NOM for new batteries put on the EU market by 2030 Phase-out subsidies, shift to fiscal benefits based on demand-led tools (circular index, eco labelling…)
Entry Gate 2 – CAM/PCAM Producers	Introduce LC criteria (progressive depending on Max NOM) in demand boost program and public procurement Introduce LC criteria in minimum recycled content policies (Battery Regulation by 2031 and beyond or ELV regulation for steel, aluminum and plastic minimum recycled content provisioned in current draft regulation)	Define a progressive roadmap to introduce LC criteria into eligibility for public CAPEX and production aid Annual review of LC thresholds based on competitiveness indicators (e.g. energy, material costs)	1-2 years after battery cells, implement or increase LC thresholds within future production incentives Annual review of LC thresholds based on competitiveness indicators (e.g. energy, material costs)	Integration with End-of-Life Vehicle (ELV) regulation: LC obligations linked to minimum recycled content in steel, aluminum, and plastics
Entry Gate 3 –Recyclers		Black mass export tax	Production and capacity incentives for recyclers producing battery-grade materials (partly funded by export tax on black mass) Extend LC obligation to CAM/PCAM producers sourcing secondary raw materials	Black mass export ban or limitation
Environmental Criteria and Demand Boosting Mechanisms	Define methodologies and reporting schemes (circular index for key materials: aluminum, steel, polymers, carbon footprint indexes or labelling) Define a reparability index		Implement progressive thresholds in demand-boost instruments (e.g. public procurement, fleet schemes)	Regulatory standards (CO_2, circularity): set a trajectory of targets to fulfill for the yearly sales of new vehicles

FIGURE 2. Concept for a resilient and competitive European battery supply chain



Timely integrated appraoch of LC, boost and aids policies along the battery supply chain

6. CONCLUSION: A STABLE YET PROGRESSIVE LONG-TERM STRATEGY

Europe's battery future will not be secured through fragmented policies or static incentives. It demands a systemic, coherent, and time-calibrated support framework that blends protection with incentive, investment with demand creation. Only a tool-mixed and progressive industrial policy, executed in partnership with industry, can ensure Europe captures the value of its clean mobility transition and builds lasting economic and technological sovereignty in the battery sector.

ANNEX 1: OPTIONS OF PRODUCTION SUPPORT FOR THE BATTERY ECOSYSTEM

This annex provides an inventory of potential public support mechanisms for different stages of the battery value chain (pCAM, CAM, cell manufacturing and recycling). It outlines their advantages and drawbacks.

Key principles:

— All mechanisms below are intended to be temporary and degressive, encouraging EU actors to catch up with international competitors and reflecting the learning curve they face.
— They are designed to be paired with local content rules, ensuring that support for EU producers offsets the higher cost of sourcing local products for their clients (e.g., OEMs for battery cells, battery cell makers for CAM). Compliance with local content rules (e.g. % of value add or other rule) is a prerequisite to benefit from the mechanisms.

The table only provides examples of subsidy amounts for cell producers and the first production aid option. This is because (i) the support volumes for other segments (like pCAM/CAM and recycled materials) are still under evaluation, and (ii) the other options need more detailed feasibility studies and robust benchmarks. The disclosed numbers are not intended as recommendations for this option.

Support Mechanism	Key Features	Possible Formats	Advantages	Drawbacks
Production-based subsidy (€/kg or €/kWh)	- Temporary (5-7 years) - Targets actual output - Differentiated by value chain segment	-Tiered by production volume growth *(e.g for cell production: €25/kWh (0–20 GWh) → €15/kWh (20–50 GWh) → €5/kWh (50–100 GWh), max €1.2bn/company.* -Tiered by production capacity use. *Progressivity and level of aids linked to the plant production ramp-up as a ratio of installed production capacities.* -Tiered over time (*e.g for cell production: support is limited to six years, with a sliding scale starting at €25/kWh for years 1-2, then €20/kWh for years 3-4, and €15/kWh for years 5-6.* *Option: a tiered premium scheme based on local value-added level could also be an option, for instance offering €5/kWh for batteries with ≥20% EU value-added, €10/kWh for ≥40%, and €15/kWh for ≥60%*	- Predictable for investors/ lenders - Directly tied to production - Comparatively simple to implement	- Ignores production cost fluctuations - Less flexible
Targeted OPEX subsidy	- Temporary (5-7 years) - Covers key production costs - Differentiated by value chain segment	- Like production subsidies above, can be tiered by production volume growth, % of capacity use or over time. - Indexed to energy/raw material prices - Flat-rate for labor, energy, logistics	- Flexible, adjusts to cost variations - Efficient to manage cost pressures - Precisely targeted	- Complex admin/ monitoring - Less visible/bankable for investors compared to volume-based subsidies - Market distortions if miscalibrated

Support Mechanism	Key Features	Possible Formats	Advantages	Drawbacks
Payment for Difference (PfD)	- Temporary (5-7 years), degressive to encourage cost convergence - Bridges cost gap vs. Asian competition - Payments are tied directly to actual production volumes delivered to customers. Characteristics - Indexed to actual cost drivers (energy, feedstock, labor) - Reference price based on Asian benchmarks (trade data, import/export data, international market intelligence agencies) - Adjusted for chemistry, transport, recovery rates (recycling) - Updated quarterly/ semi-annually/annually Safeguards - Caps on compensation and sunset clauses - Requires 3rd-party verification - Must be proportional and comply with EU State aid law	Pros and cons common to both producer-side and customer-side payments for difference	- Provides bankable investment visibility - Secures early market share - Encourages offtake and industrial scaling - Highly responsive to market conditions	- Complex administration (benchmarking, verification) - Segment-specific technical challenges (e.g. few pCAM prices, adjusting for chemistries in CAM and cells, quality of recycled materials) - Risk of overcompensation if not precisely calibrated - Needs safeguards against long-term dependence
		Producer-side PfD - EU pays producers the difference between EU and Asian benchmark prices - Payments linked to volumes delivered to customers	- Directly supports ramp-up - Bankable for financing - Simple supply-side support	- Needs robust price definitions - More complex than production subsidies without significant additional benefits
		Customer-side PfD - EU pays customers (e.g. OEMs) to offset higher EU production costs - Structured via pre-approved offtake contracts with EU producers	- Secures demand pull - De-risks offtake for upstream investments	- Legally/admin complex (private buyers) - Pricing data verification challenge - Potential for overcompensation without clear benchmarks

Hautsch, M., Hermine, J.-P. (2025). Plan for the emergence, competitiveness, and resilience of an EU battery ecosystem — Leveraging combined use of local content policies and of new public aids schemes. *Policy Brief* N°02/25, IMT.

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