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Green Industrial Policy in Multilevel Governance: Low-Road and High-Road Strategies in Europe's Battery Rollout

New Thinking in Industrial Policy Conference, Columbia University
Nov 7, 2025

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The EU's quest to catch up with China in EV battery manufacturing

Chinese imports would offer a faster (and cheaper) way to decarbonize

But the EU still wants to onshore the industry – for climate, economic & security reasons

- to have higher environmental standards in production
- to retain its automotive industrial base & capture value in a high-growth sector
- to decrease geopolitical exposure

POLITICO

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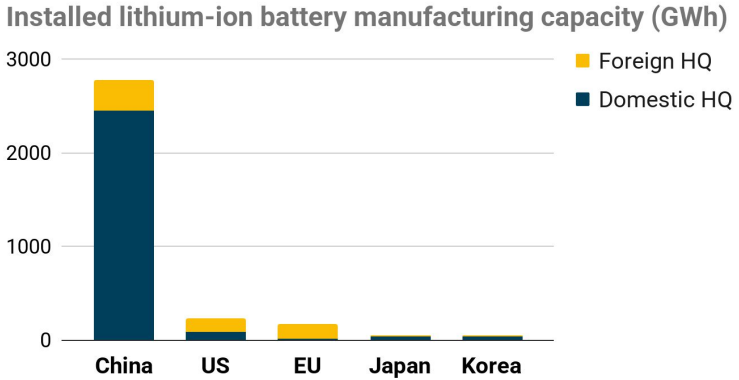
Von der Leyen warns Europe must defend green tech against China



The starting puzzle: Hungary's emergence as a "battery superpower"

78 GWh/a capacity (Samsung SDI, SK) – global #4, ¼ of EU production
The bloc's largest project pipeline (CATL, EVE)

Lauded by Brussels as a "champion" – *but pursues a low-road strategy*

Battery gigafactories are contested locally for –

- ecological devastation
- limited developmental gains
- growing dependence on China & Russia

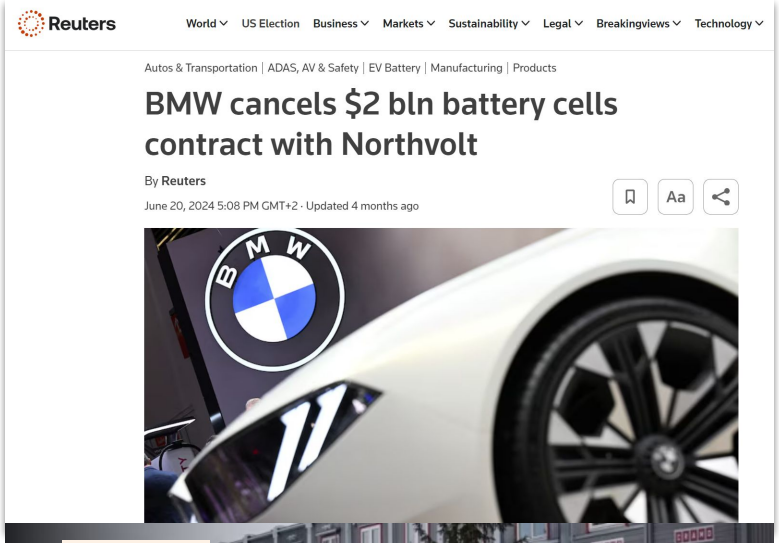
The sector's frontrunner undermines the exact goals the EU's battery onshoring is meant to achieve

Meanwhile: Europe's domestic battery champions are faltering

Sweden's Northvolt aimed for 100% renewables-powered production; based on domestic R&D – *a high-road strategy*

The company lost a $2bn contract due to production delays and quality concerns; BMW pivoted to Samsung SDI (Hungary) – Northvolt filed for bankruptcy in late 2024.

Other domestic startups, PowerCo (VW) and ACC (Stellantis) also cancelled projects.



Why is it so difficult to keep the green manufacturing rollout on a more ambitious track?

Empirical strategy

- Compiling a dataset of EU-based gigafactory projects, monitoring status and fiscal support, assessing risk
- Case studies of all 5 member states with operational cell manufacturing capacities as of 2024 (PL, HU, DE, FR, SE)

Green industrial policy and its nested trade-offs

The promise of green industrial policy is bundling disparate objectives together to enlarge the climate coalition

Industrialists joined in: a productive 'bargain' with decarbonizable sectors (Kupzok and Nahm 2024, 2025, see also: Kelsey 2018, Fischer 2025)

Geopolitical hawks joined in: the geopolitical competition motivates green industrial policy (Meckling 2025; McNamara 2023)

BUT – bundling policy aims together invites trade-offs that need to be governed

Green industrial policy and its nested trade-offs

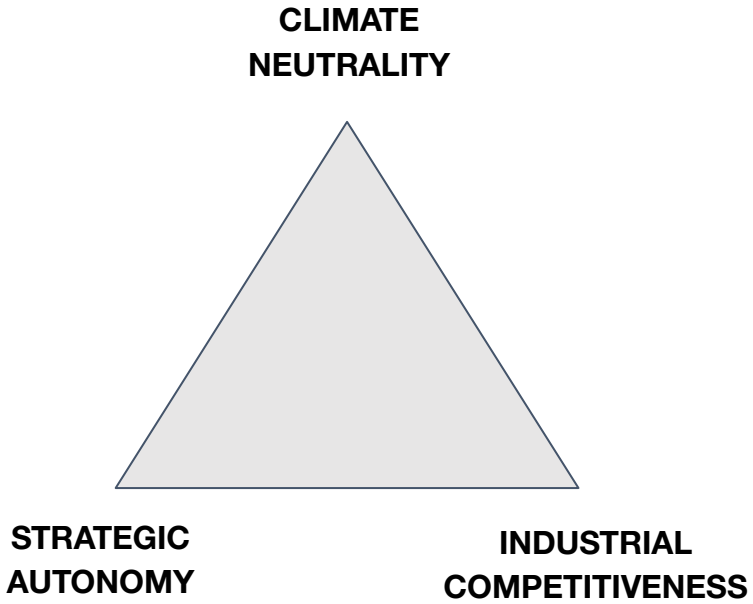
Is the EU-level willing and able to impose coherence?
No, because Brussels is constrained in both carrots & sticks

- SUBSIDIES – the EU's industrial policy turn mostly meant relaxing member state level state aid restrictions (Di Carlo et al. 2024), the EU-level budget is still only 1% of GDP
- REGULATION – the EU has an enforcement crisis – common standards are under-enforced (Kelemen & Pavone 2023)

Strategic ambiguity (leaving policy aims vague, not operationalizing them in binding ways) is politically expedient

→ Trade-offs are not resolved at the center – but displaced onto member states and firms who respond to their own incentives

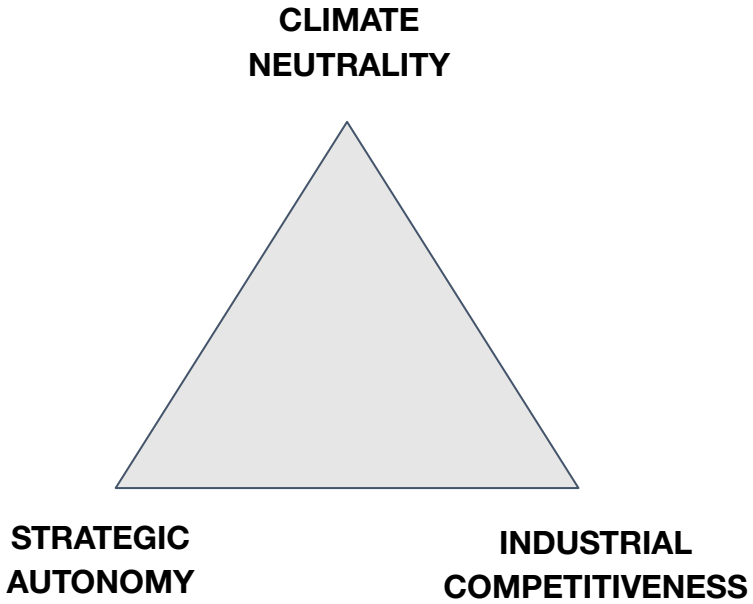
From trilemma to nested trade-offs



The battery industrial rollout as a TRILEMMA?

If one wants a green industry that is competitive and geopolitically resilient (i.e. less dependent on China), something must give

From trilemma to nested trade-offs



The battery industrial rollout as a TRILEMMA?

If one wants a green industry that is competitive and geopolitically resilient (i.e. less dependent on China), something must give

BUT these three are not singular aims, but clusters of sub-goals, containing nested trade-offs

Trade-offs arise not only BETWEEN but also WITHIN policy aims

Climate Neutrality	**Fast clean-tech rollout** Rapid rollout on fossil-heavy grids; attracts & sustains investment by weakened environmental standards	**Sustainable production** Ensures that production uses low-carbon inputs & avoids local harm
Industrial Competitiveness		
Strategic Autonomy		

Extractivism scholarship (e.g. Riofrancos 2017, 2020) – also relevant for green manufacturing

Climate Neutrality	**Fast clean-tech rollout** Rapid rollout on fossil-heavy grids; attracts & sustains investment by weakened environmental standards	**Sustainable production** Ensures that production uses low-carbon inputs & avoids local harm
Industrial Competitiveness	**Jobs and output now (via FDI)** Weakly conditioned FDI in low value-added segments; automakers' short-term needs trump long-term tech sovereignty	**Long-term domestic capabilities** Secures future value capture and innovation by fostering 'domestic champions' and/or disciplined FDI
Strategic Autonomy		

A late development dilemma (e.g. Amsden 1987, 1989, Stallings 1990) – openness to FDI without entrenching dependence?

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Strategic Autonomy	**Physically localized production** Secures more proximate suppliers	**Reduced geopolitical exposure** Prioritizes domestic ownership & geopolitical alignment

Was there really a "geopolitical turn" in the EU? (McNamara 2023, Bauerle Danzman and Meunier 2024)° ° °
In a very limited sense (with a lot of discursive fluff)

	Minimalist path (Subversion risk)	**Maximalist path** (Viability risk)
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Climate	**Gas reliant power sector Ecological damage**	High-emission power sector Ecological damage	High-emission power sector	Cleaner power sector	Cleanest production profile (100% green energy)
Industry	**Fully FDI-based, low value-added, domestic ecosystem shallow**	Fully FDI-based, low value-added	Both domestic players (PowerCo) and FDI strong domestic ecosystem	Domestic champion based strategy (Verkor, ACC) FDI w tech-sharing conditionality	Fully domestic, local R&D
Geopolitics	**Chinese and Russian dependence**	No domestic capacity, but avoids Chinese FDI (only upstream)	Hedging with domestic players, but also exposed to China & Hungary	Geopolitical hedging: China present, but balanced out	Domestic capacity

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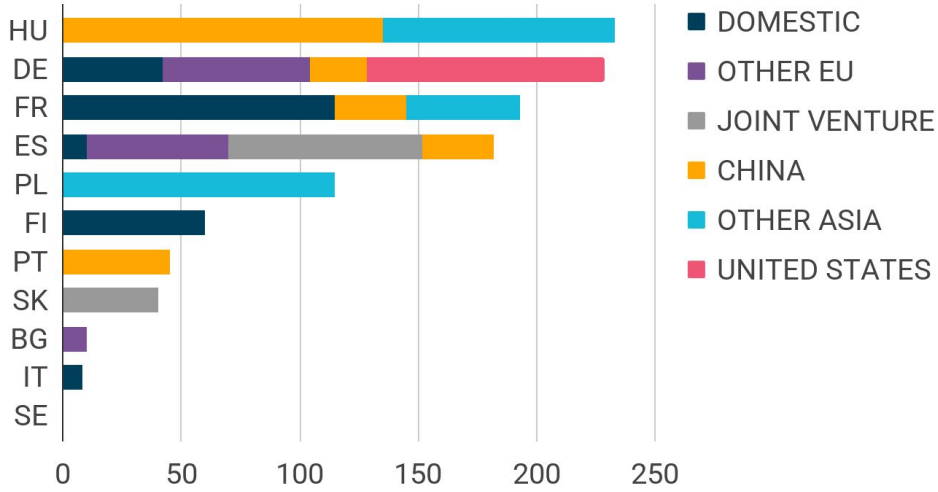
Minimalist pathways dominate operational capacities

Country	Company	HQ	City	Capacity (GWh)
Poland	LG Energy Solution	Korea	Wrocław	86
Hungary	Samsung SDI	Korea	Göd	40
	SK Innovation	Korea	Iváncsa	20
	SK Innovation	Korea	Komárom	18
France	ACC	Domestic	Douvrin	15
Germany	CATL	China	Erfurt	14
Sweden	Northvolt*	Domestic	Skellefteå	16
				209

OPERATIONAL battery manufacturing capacities as of 2024

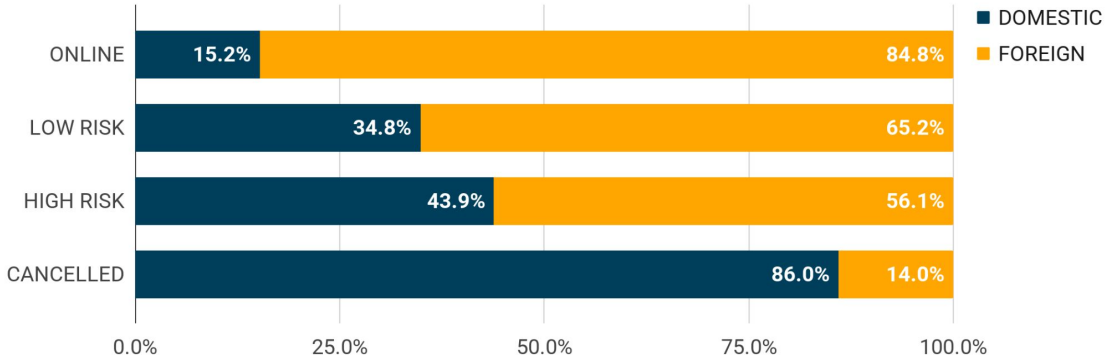
*Production at Northvolt's Skellefteå site was discontinued on 31 June, 2025

The EU is planning to scale up to 1125 GWh/a by 2030 – mostly through FDI



Planned 2030 battery manufacturing capacities by company HQ
announced gigafactory projects (GWh/a, maximum capacities)

There is a risk gap between domestic and foreign projects



Operational and planned battery manufacturing capacities in the European Union by risk profile and headquarters (% of category total; as of 2024)

Risk is also correlated with fiscal support

	Total fiscal support (million €)	**Number of projects**	**Average fiscal support** (million €)
ONLINE	1,652. 3	7	**236.0**
LOW RISK	4,650.6	17	**273.6**
HIGH RISK	700.0	5	**140.0**
CANCELLED	807.0	12	**67.3**
	7809.9	**41**	

Fiscal support to battery gigafactory projects by risk profile

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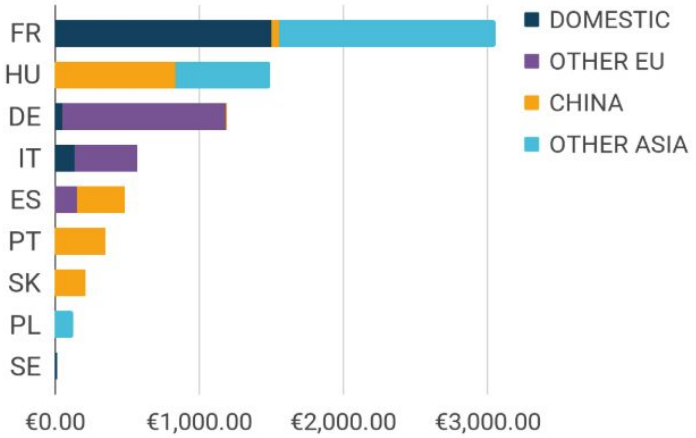
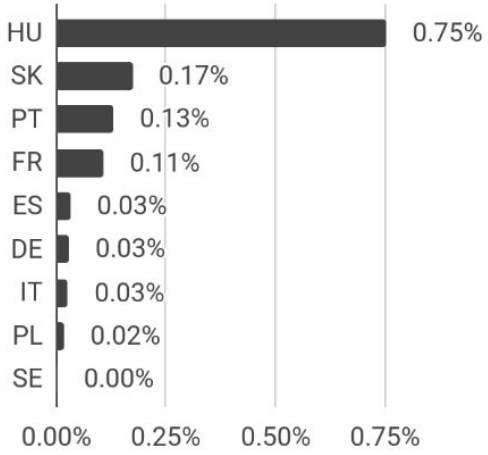
Fiscal support to battery gigafactory projects by risk profile

The only European champions still standing (PowerCo, Verkor, ACC) are linked to carmakers with strong state ties – allowing for a more patient investment strategy

EU member states simultaneously subsidize domestic (or European) champions and their foreign competitors



Fiscal support to battery gigafactory projects by member state and receiving company HQ (million euros)



Fiscal support, % of national GDP

To sum up–

The EU's battery rollout is tilted towards minimalist (low-road) strategies

- Maximalist pathways promise longer-term autonomy and innovation, but face daunting financial and execution challenges—especially when undermined by generously subsidized foreign competitors within the same single market
- Minimalist pathways may deliver speed and industrial jobs, but risk locking the EU into low value-added and geopolitically fragile supply chains – *and involve exploitative practices*

Policy implications

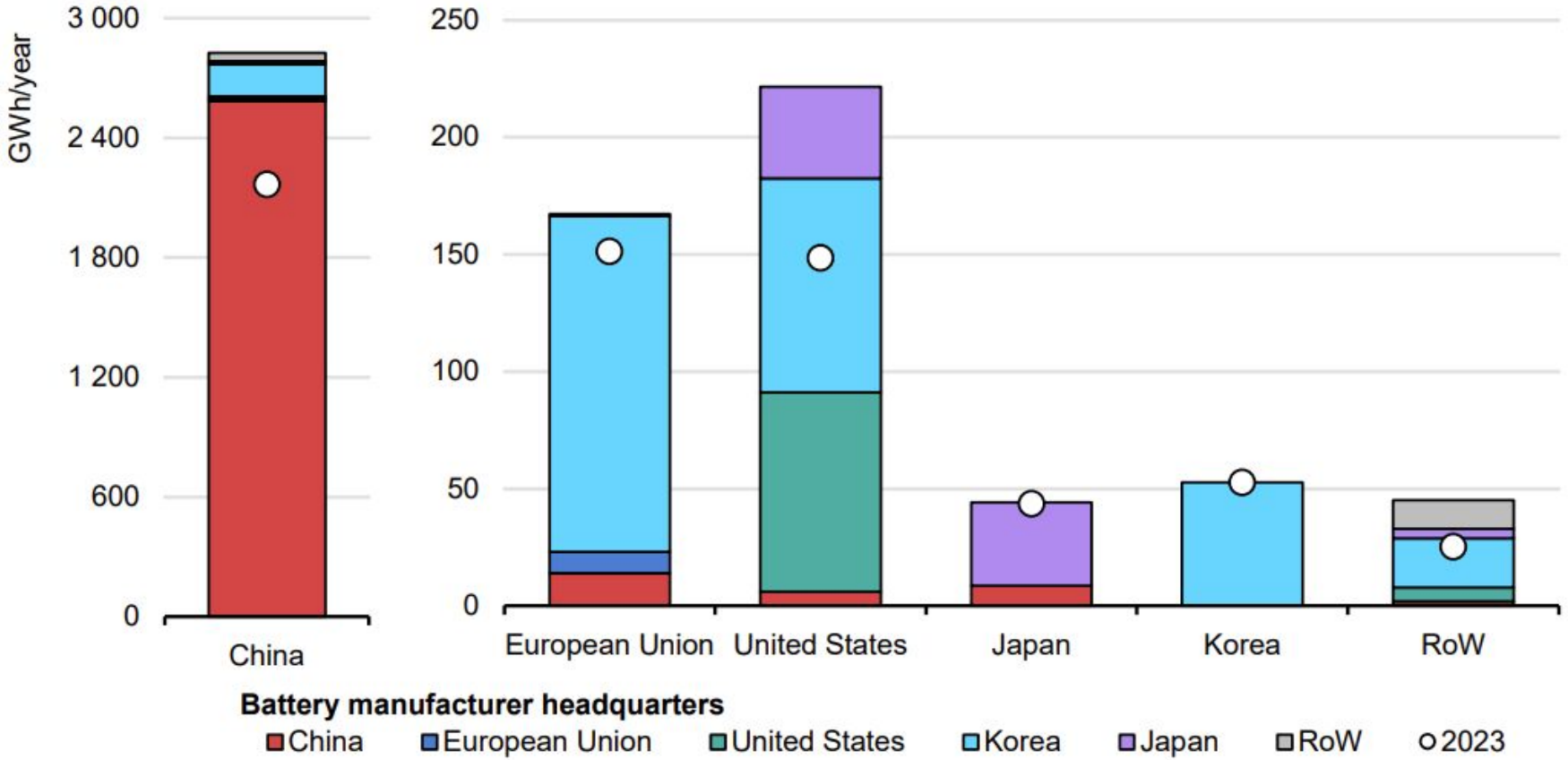
To avoiding institutionalizing the minimalist path, the EU needs to confront trade-offs, instead of wishing them away

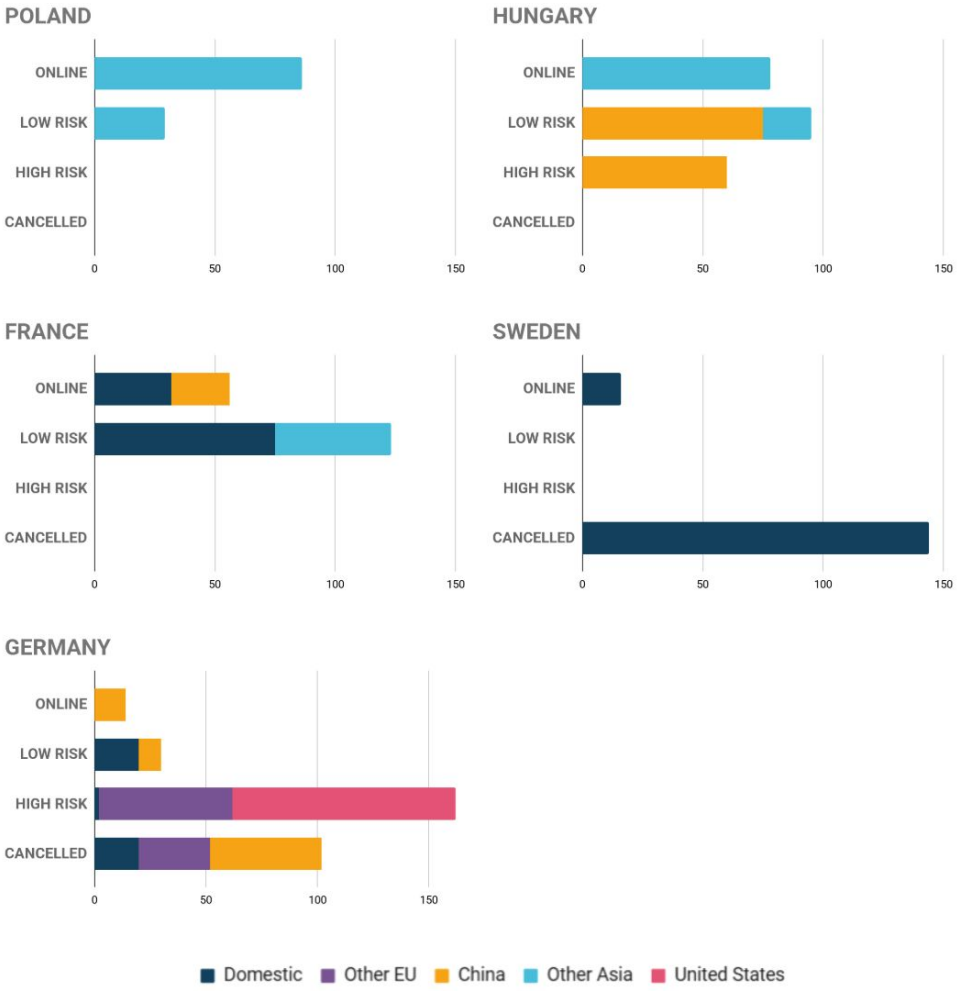
- **Climate:** Enforce the Battery Regulation (lifecycle carbon thresholds, limit ecological harm) & existing EU laws.
- **Development:** Stop subsidizing both champions *and* their foreign competitors → move toward EU-level subsidy governance.
- **Geopolitics:** Neither blanket China bans nor unconditional openness → enforce tech transfer & local content requirements.

The missing political will may come from member states with high-road ambitions, whose firms are directly uncercut by low-road competitors.

Thank you for the attention!

Installed lithium-ion battery cell nameplate manufacturing capacity by region and location of manufacturer's headquarters, 2024





Capacities by project status and company HQ (GWh/a)