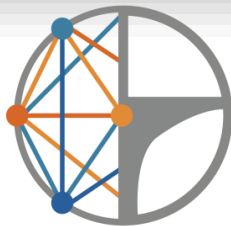


An electrifying decade ahead

- Regulations, fines and incentives are driving current shift in electrification
- Investment in in electromobility value chain – lithium-ion battery production, charging infrastructure, EV architecture
- New suppliers, new logistics locations, regulations and bottlenecks
- Spend coinciding with downturn, uncertainty and margin pressure
- Europe at centre of change...and possible disruption

Automotive Powertrain Forecast 2020 - 2030

Navigating Regional
and Regulatory Divergence
on the Road to Electrification

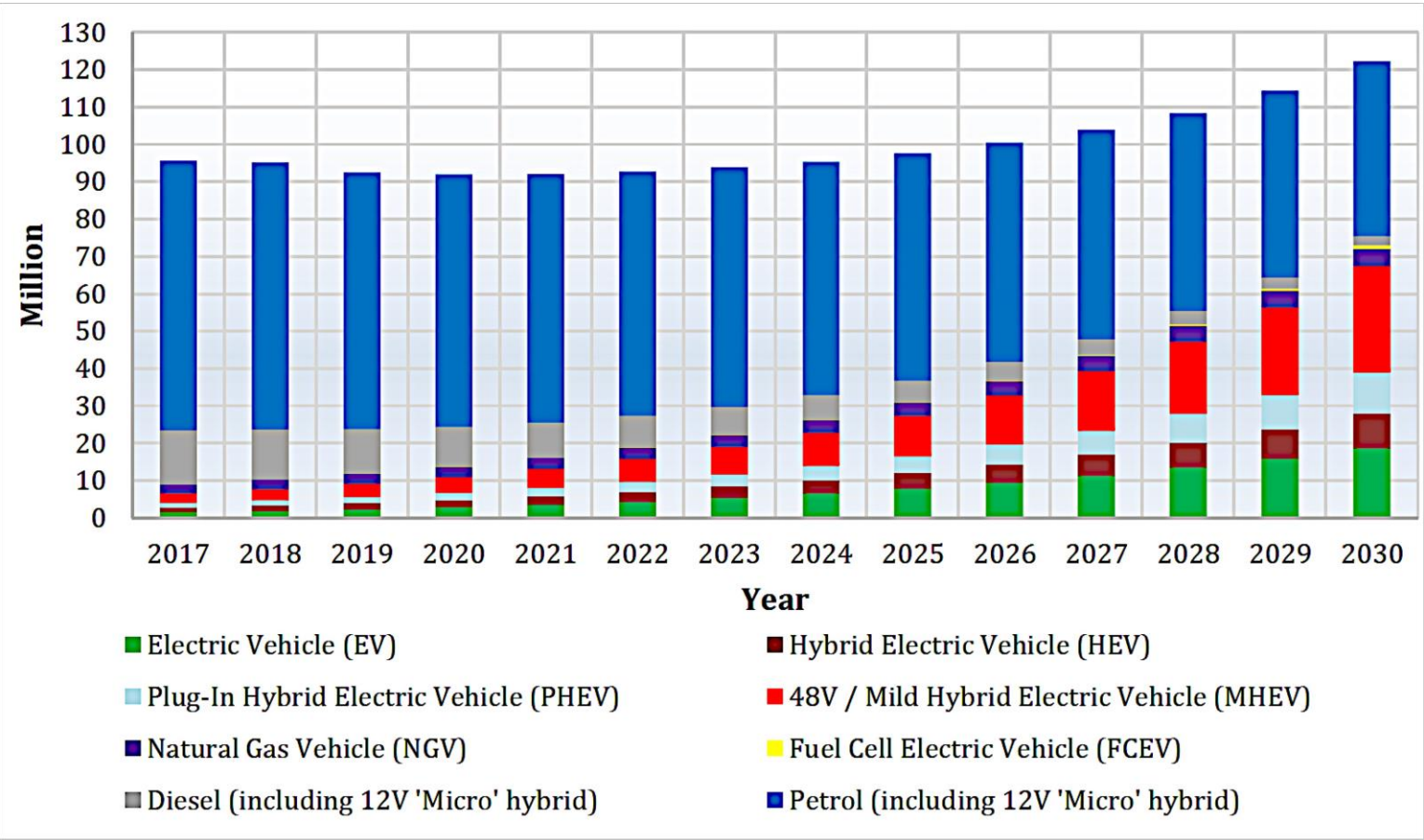


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Christopher Ludwig,
editor-in-chief

Global new vehicle sales forecast by powertrain type

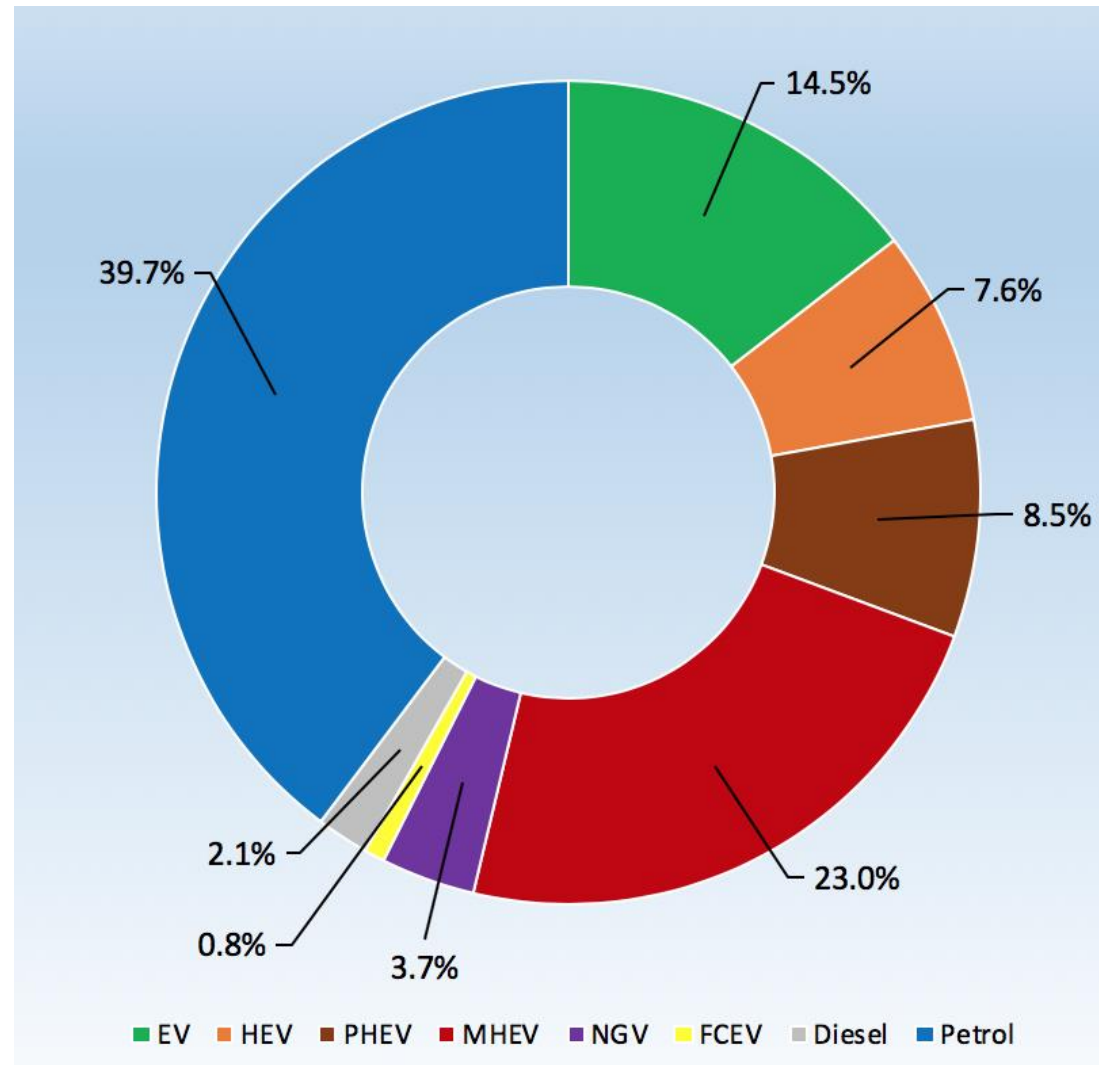


Source: Automotive from Ultima Media, Business Intelligence

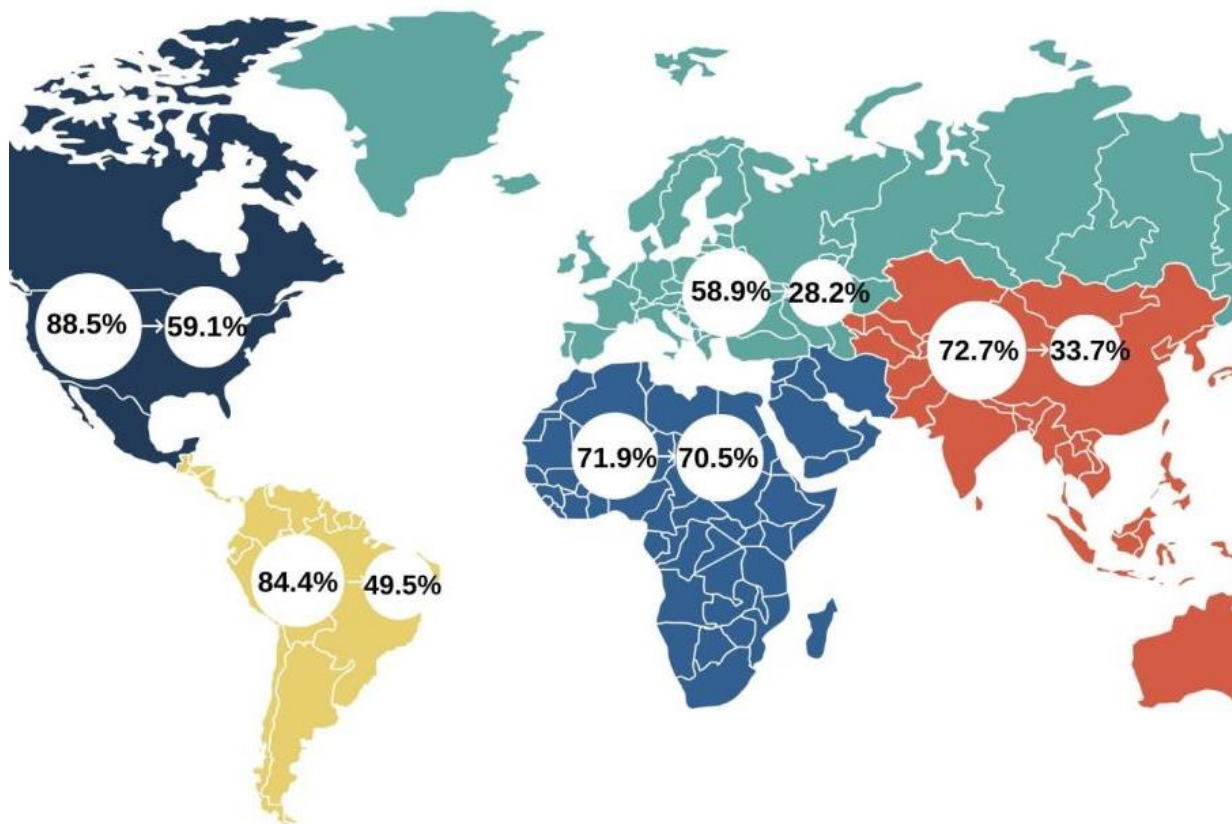
- Sluggish global growth and trade outlook for next 4-5 years
- Today it's regulations, but tomorrow infrastructure, total cost of ownership & product quality will drive EV growth (TCO parity w/ICE expected 2025 in Europe)

Global automotive powertrain mix forecast 2030

- Fragmentation across powertrain types, possibly even consumer confusion
- Electrified powertrains (EV, hybrid, plug-in) to reach more than 50%



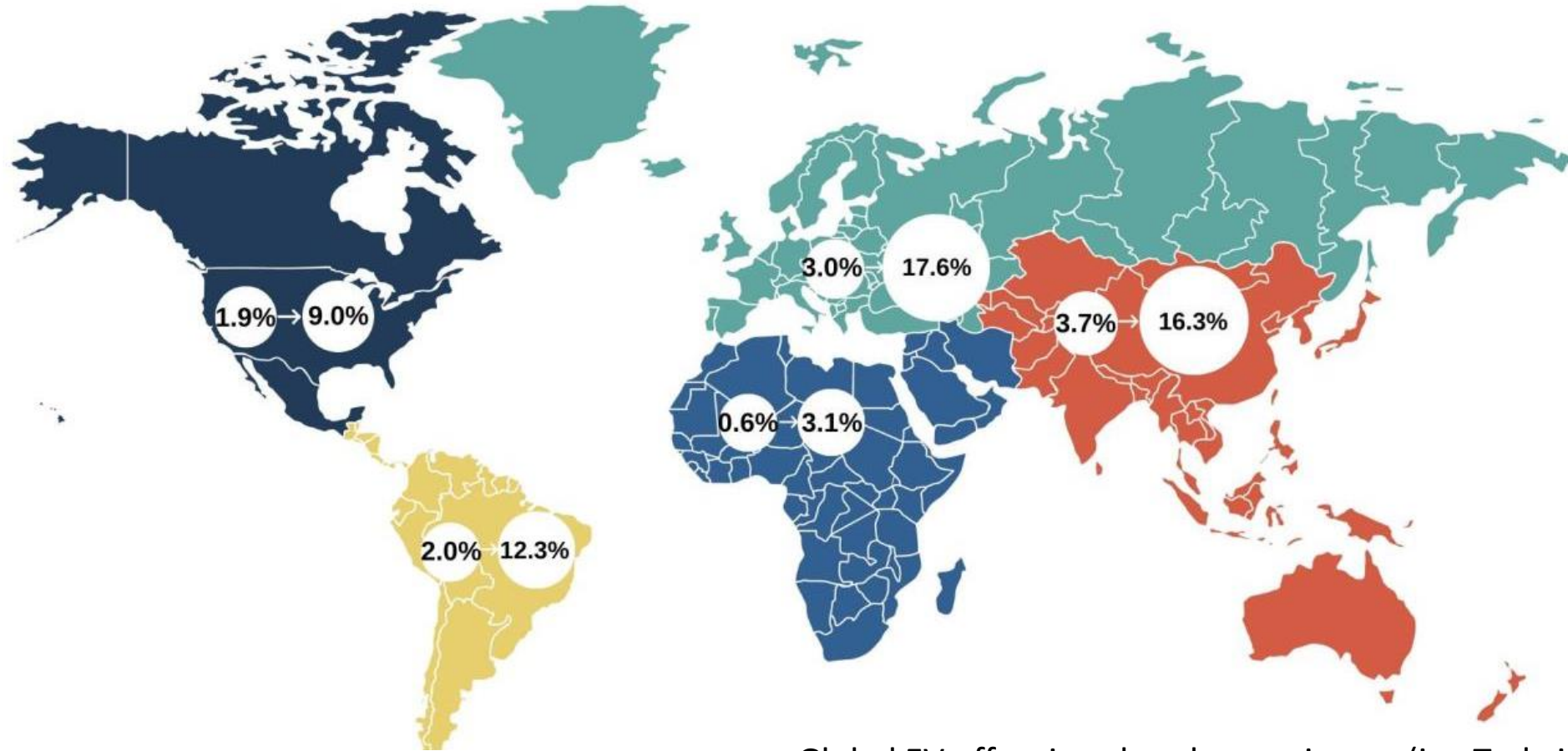
Source: Automotive from Ultima Media, Business Intelligence



Petrol powertrain new vehicle market share 2020 vs 2030

By 2030...

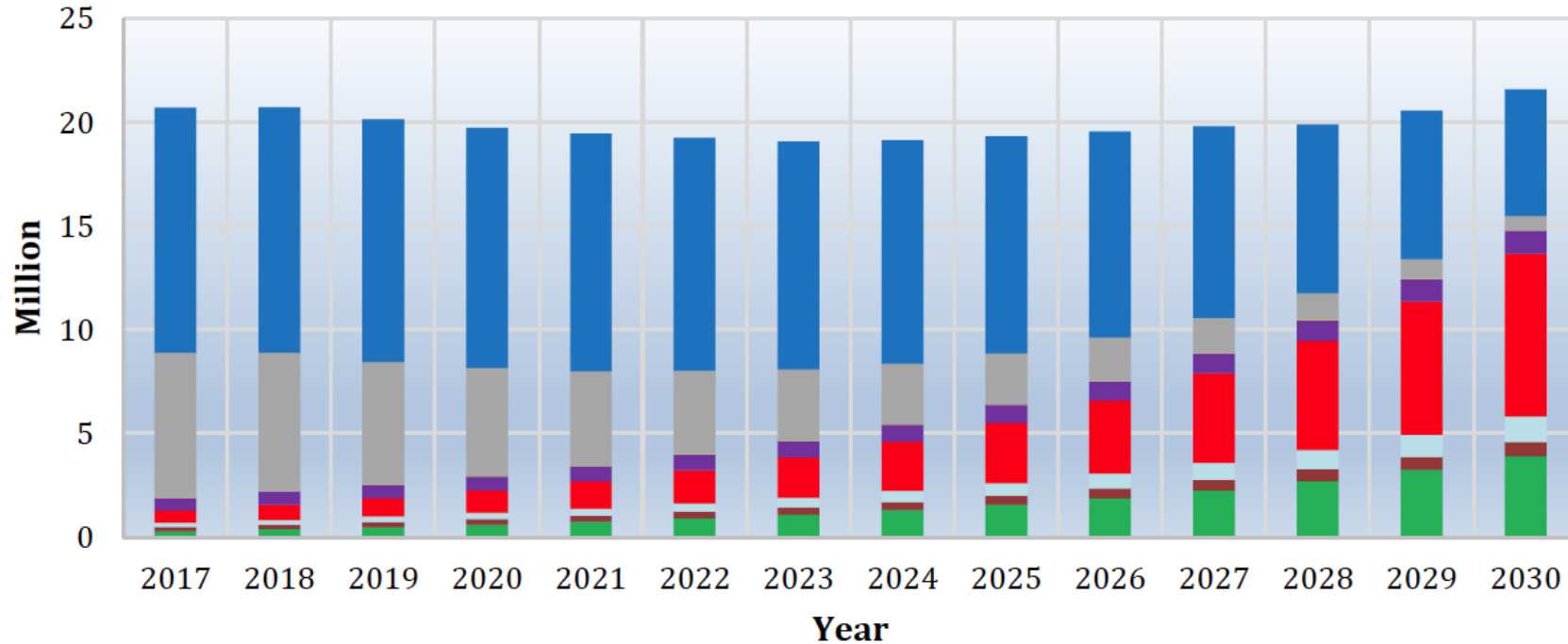
- Pure petrol still nearly 40% of global powertrains, with regional variation
- Europe falls to lowest global share (diesel drop is more dramatic)
- Petrol will still feature in more than 80% of ICE and hybrid powertrains



Battery EV powertrain new vehicle market share 2020 vs 2030

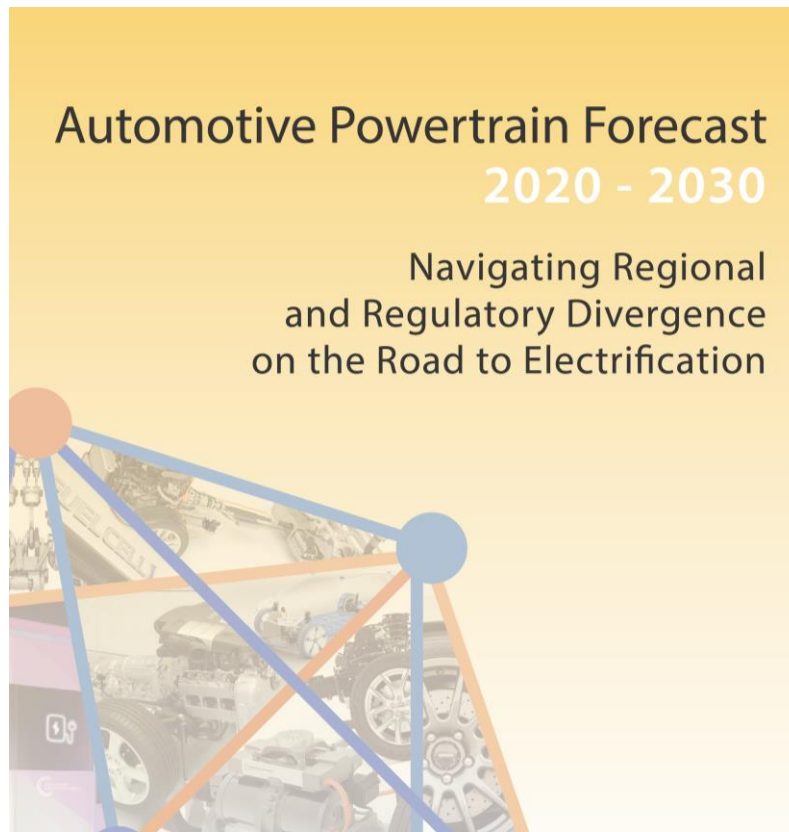
- Global EV offensive already ramping up (i.e. Tesla in Germany, China; VW in Europe, US, China)
- Regional variation in EV will become more pronounced – challenges in economies of scale and supply chain
- Parallel job losses (note Daimler, Audi, BMW, Continental, ZF, Bosch...)

Europe vehicle sales forecast by powertrain type



Source: Automotive from Ultima Media, Business Intelligence

- CO2 regulations drive biggest transition to electrified powertrains
- Diesel is largely phased out
- EV growth, but still fragmented – flexible strategy for supply chain?
- Will Europe capture more of the battery cell value chain?



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