

28 February 2023

Investor Webinar

ASX: COB

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CobaltBlue 

Webinar Agenda

1. COB update
2. The cobalt market
3. Developments in NCM and LFP Market Share
4. Influence of the Inflation Reduction Act/ Green Deal Industrial Plan response



Recent Key Milestones

- 1. Capital raise:** Placement and shareholder entitlement raised A\$22m.
- 2. Feasibility Study (FS) progressing:** Contracted engineering firms engaged, EIS fieldwork continues.
- 3. Demonstration Plant:** Underground mining and concentrate processing complete. First large scale MHP expected shortly.



BHCP: Demonstration Plant

Underground Portal



Concentrator Circuit



BHCP: Demonstration Plant

Horizontal vacuum filter belt & Pressure oxidation leach circuit



MHP (30% Co, 7% Ni) & Cobalt Sulphate (20% Co)



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Source: Cobalt Blue Holdings Limited

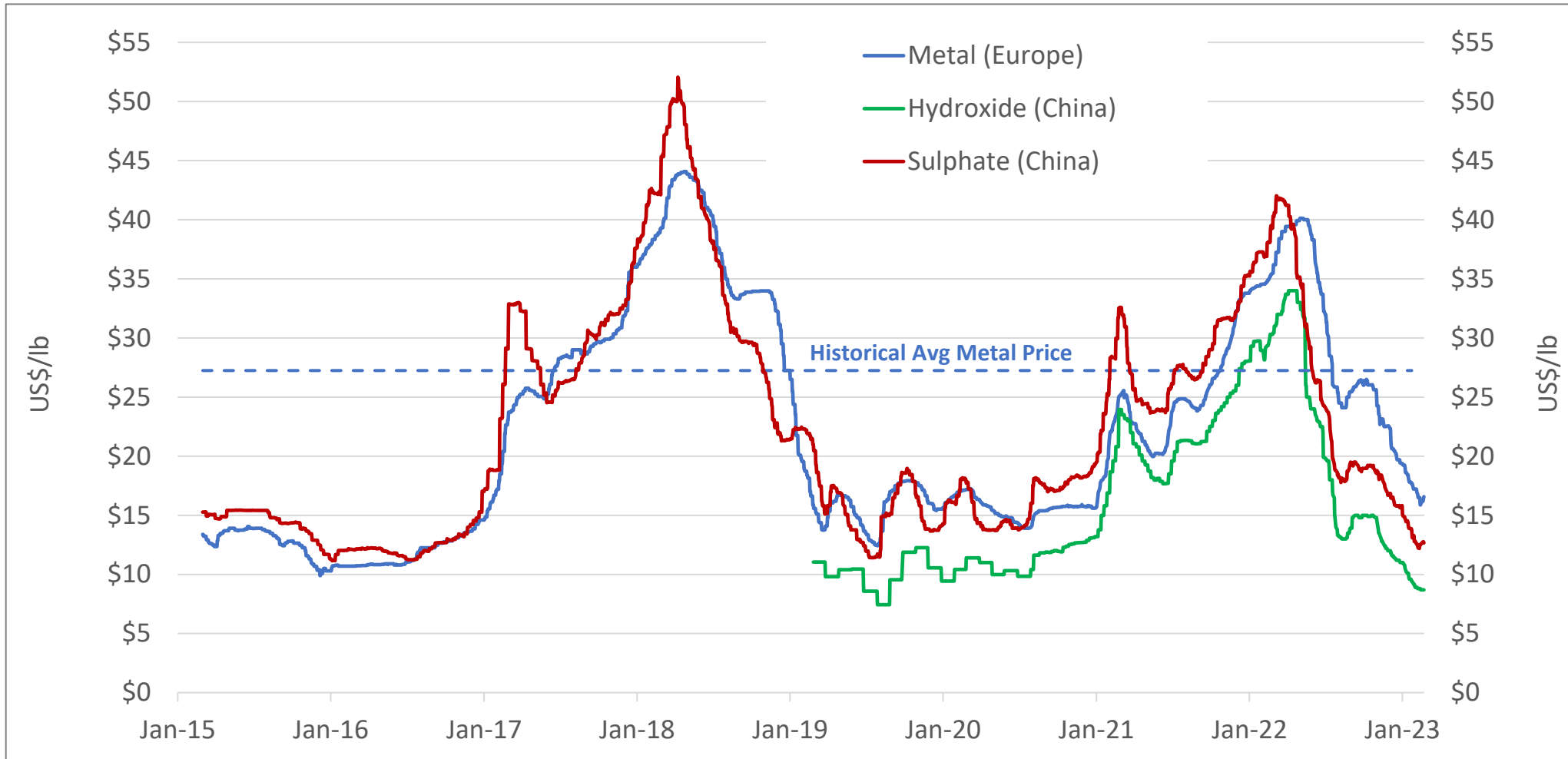


Recent Key Milestones

- 4. Project Partner discussions ongoing:** Targeting OEMs, manufacturers and traders across the battery supply chain.
- 5. Critical Minerals Accelerator Grant:** (A\$15m) funds contributing towards FS delivery.



Cobalt Prices: Supply outpacing demand

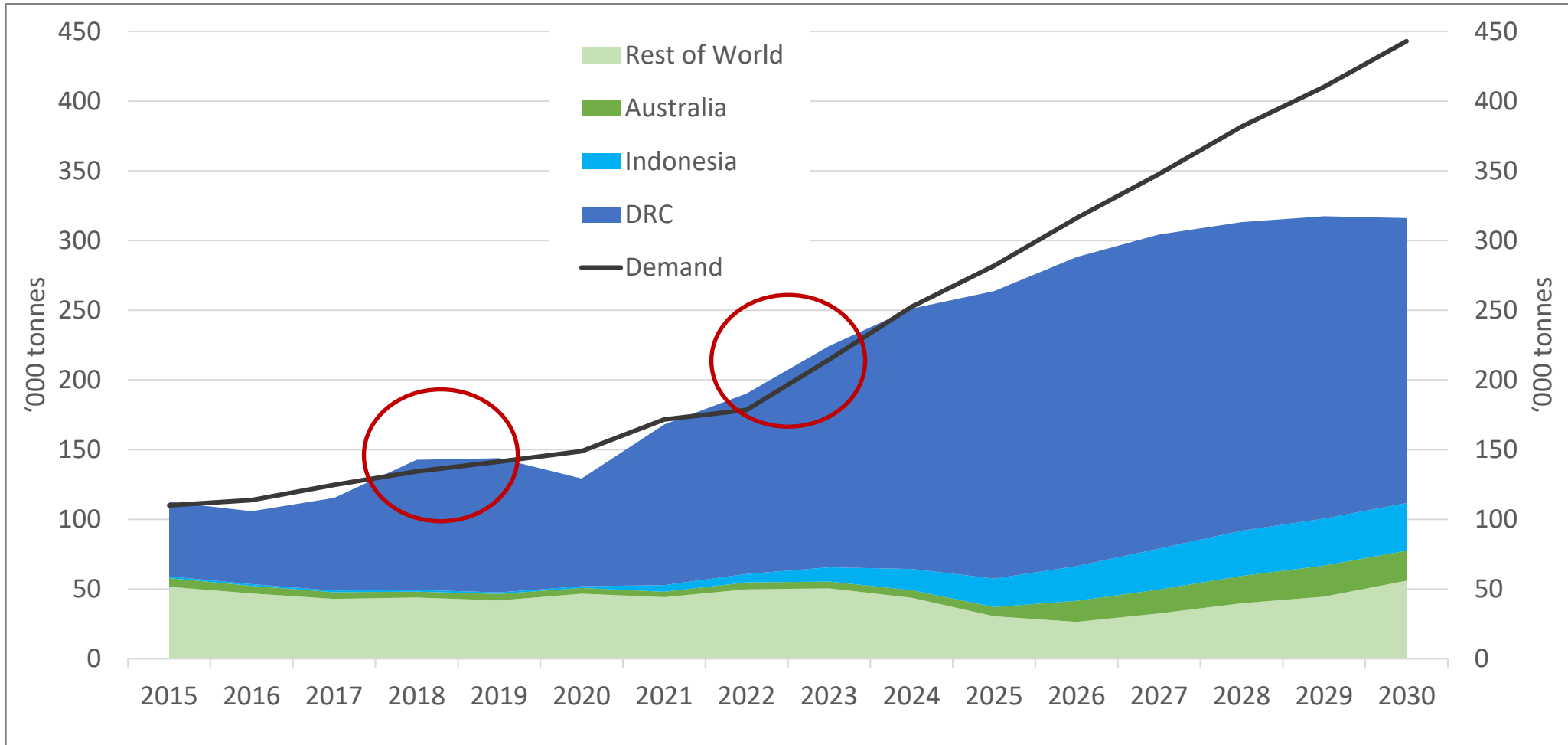


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Source: S&P Global Commodity Insights, Cobalt Blue Holdings Limited



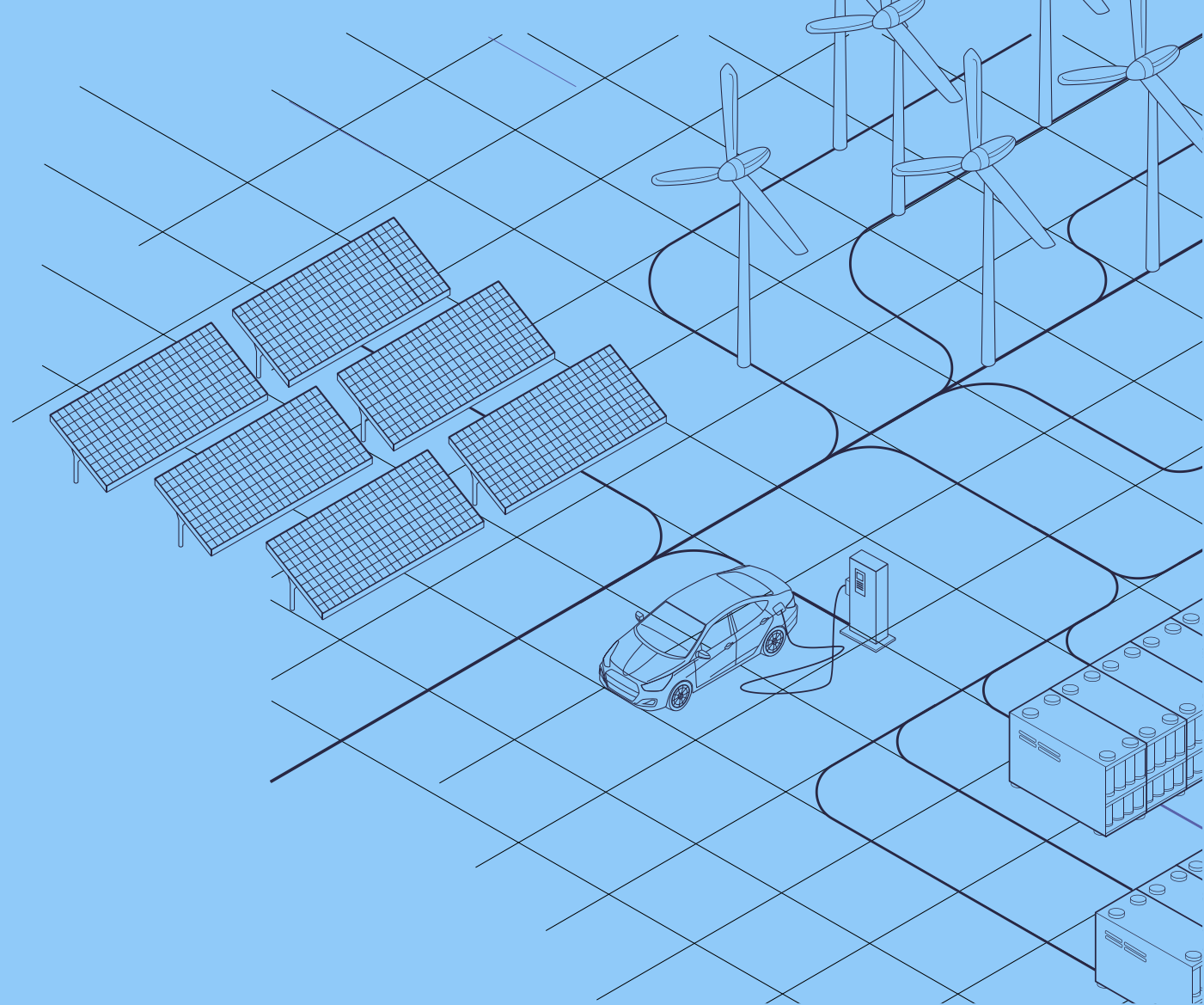
Cobalt Prices: Supply outpacing demand



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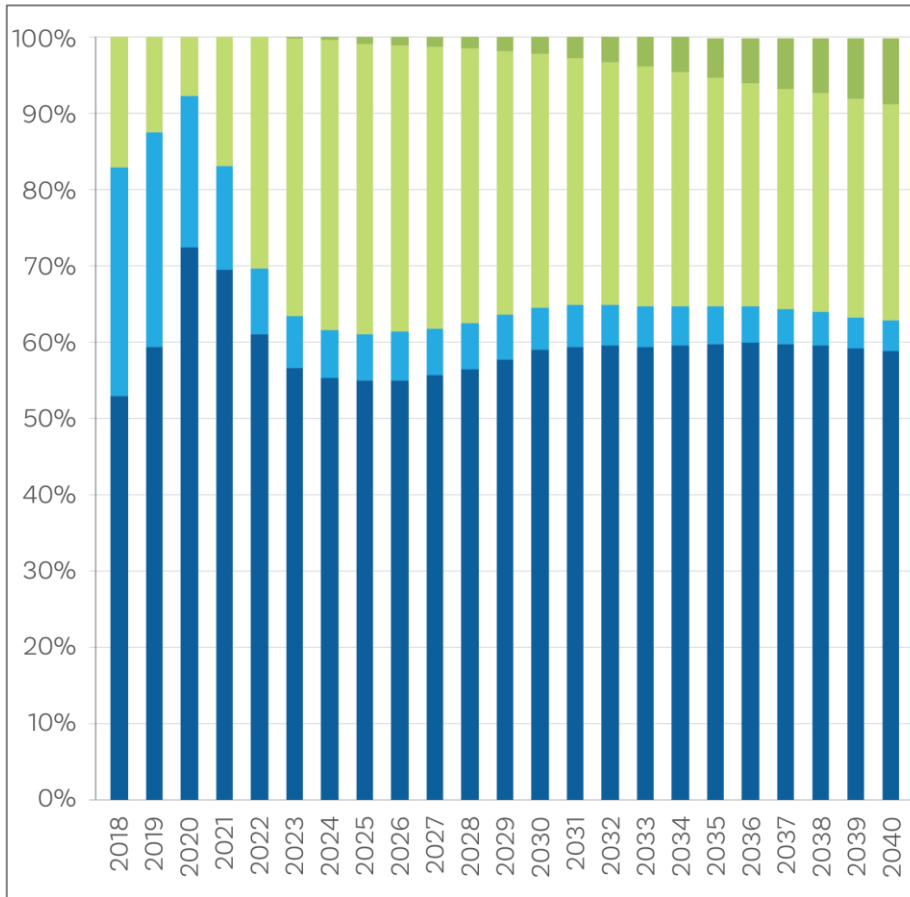
LFP and its future beyond China

Will Roberts
28th February 2023

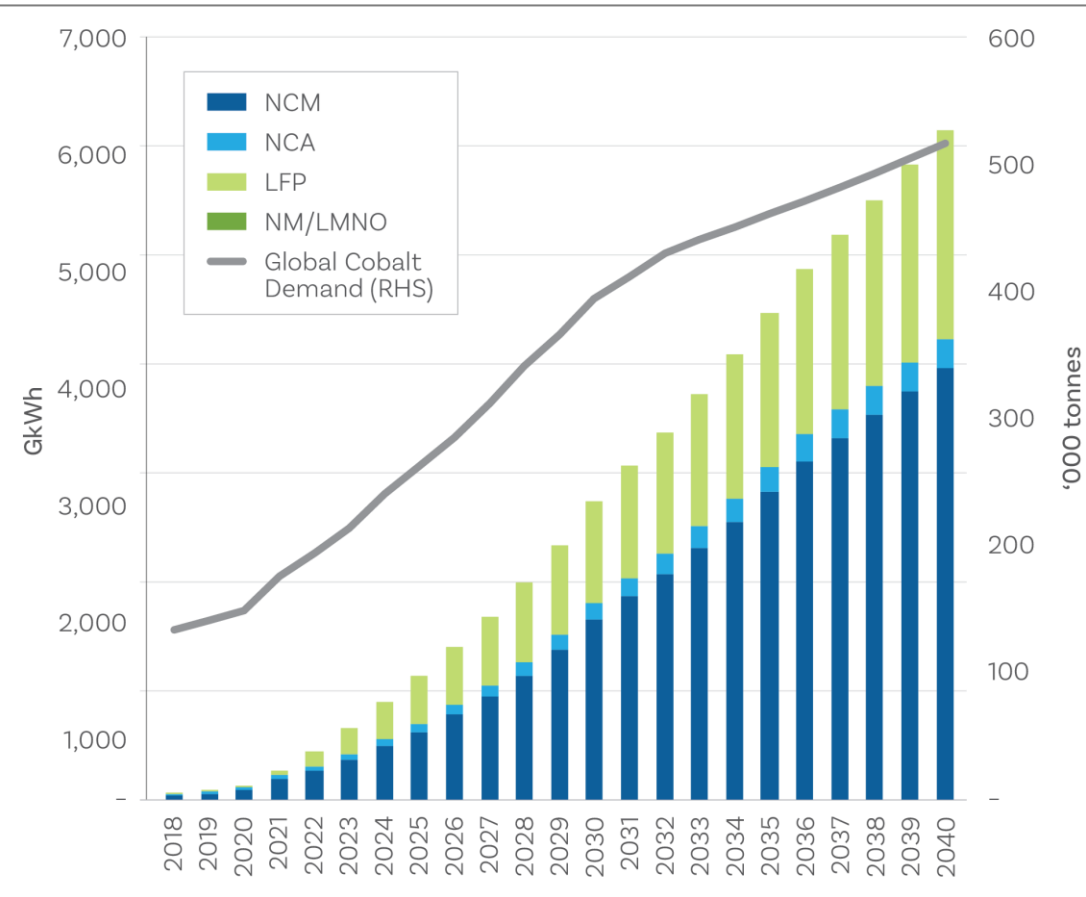


LFP share rising, so is cobalt demand

Li-ion battery cell chemistry market share



Li-ion battery cell chemistry growth vs cobalt demand



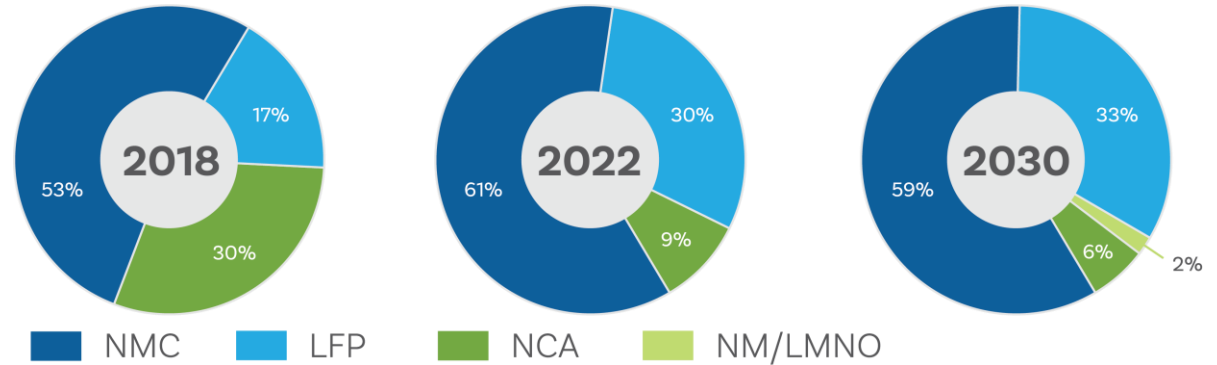
NCM vs LFP

Li-ion EV battery cell chemistry market share

Most EV batteries today use one of two types of cathodes:

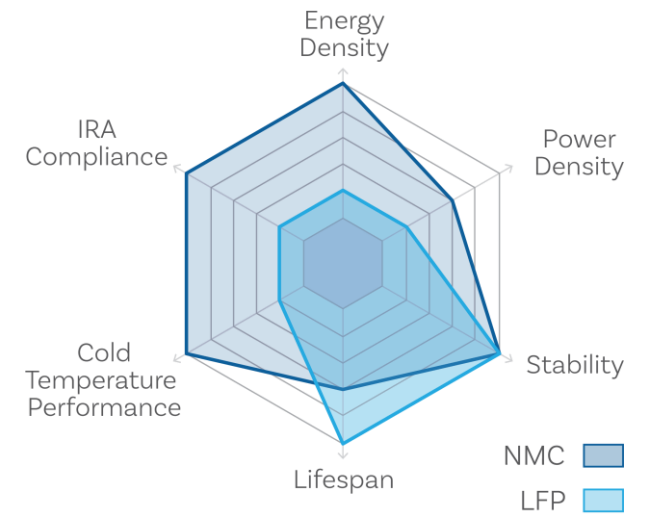
- Nickel Cobalt Manganese (**NCM**) cathodes:
 - Capable of storing more energy
 - Superior life spans
 - Superior thermal stability, thus safer
 - Use costly materials (nickel, cobalt).

- Lithium Iron Phosphate (**LFP**).
LFP cathodes:
 - Less energy efficient (due to weight)
 - Slower cold-weather charging
 - Little capacity ex-China
 - Safer in higher temperatures
 - Use less costly materials (iron, phosphate)



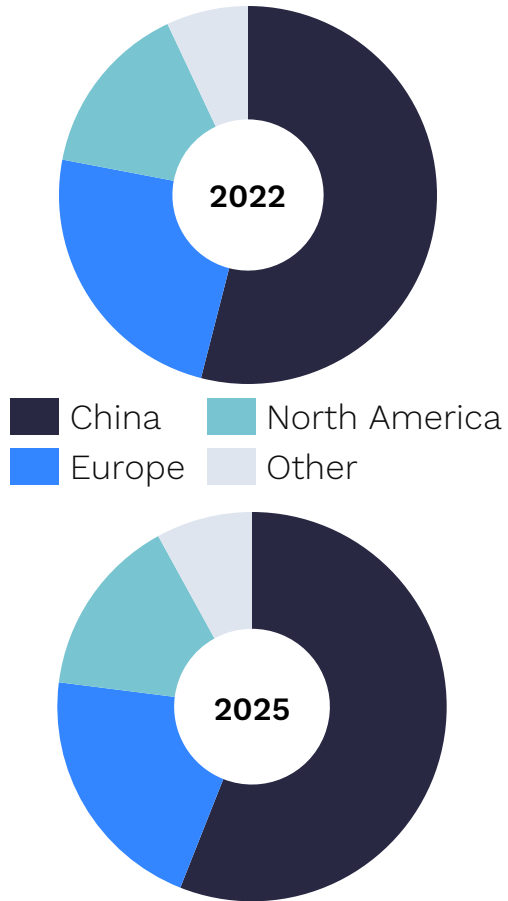
	LFP	NMC
Energy Density	●	●●●
Power Density	●	●●
Stability	●●●	●●●
Lifespan	●●●	●●
Cold Temperature Performance	●	●●●
IRA Compliance	●	●●●

●●● Excellent ● Good ● Poor

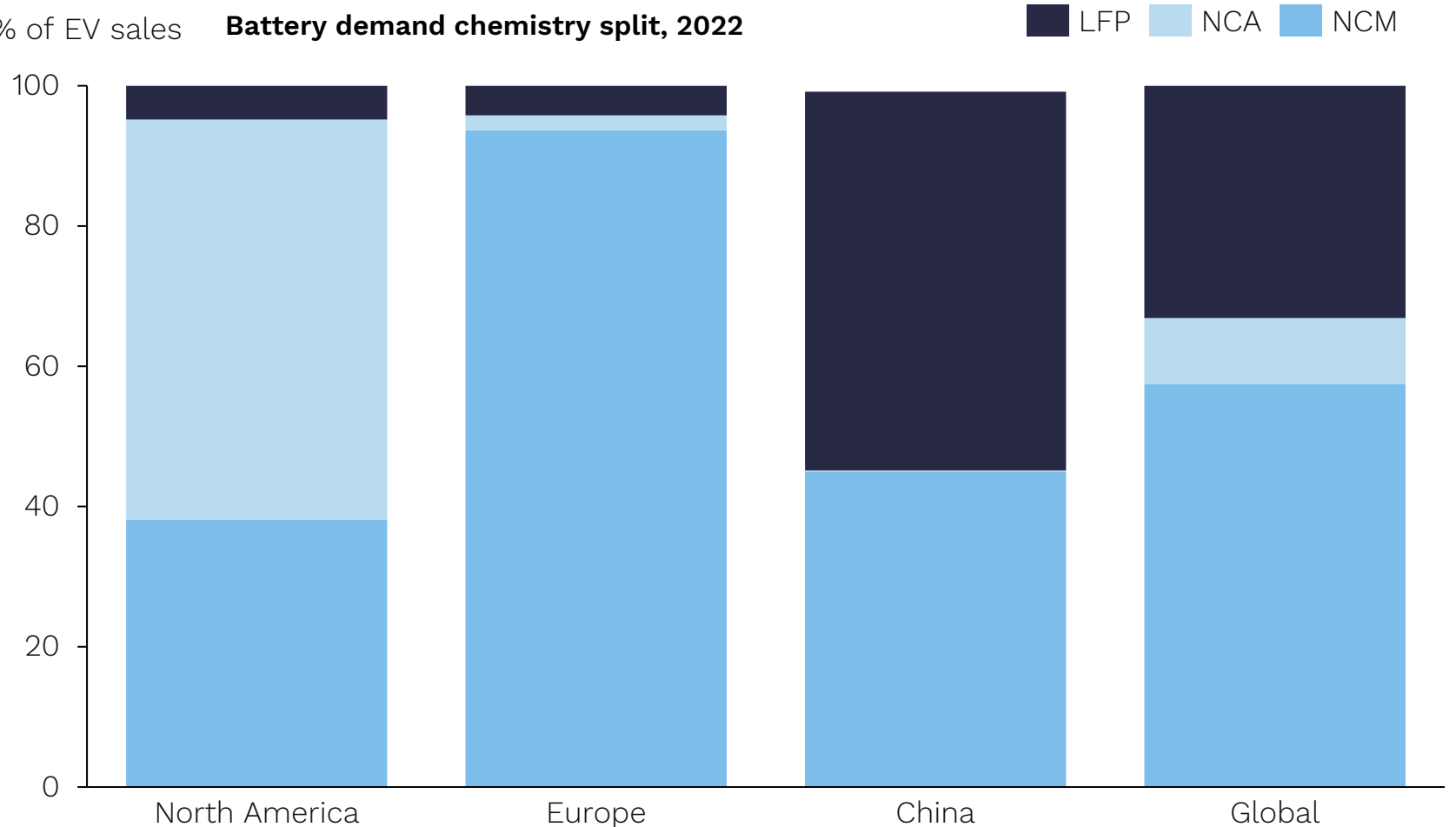


Chemistry deployment varies significantly between regions

Battery demand by region

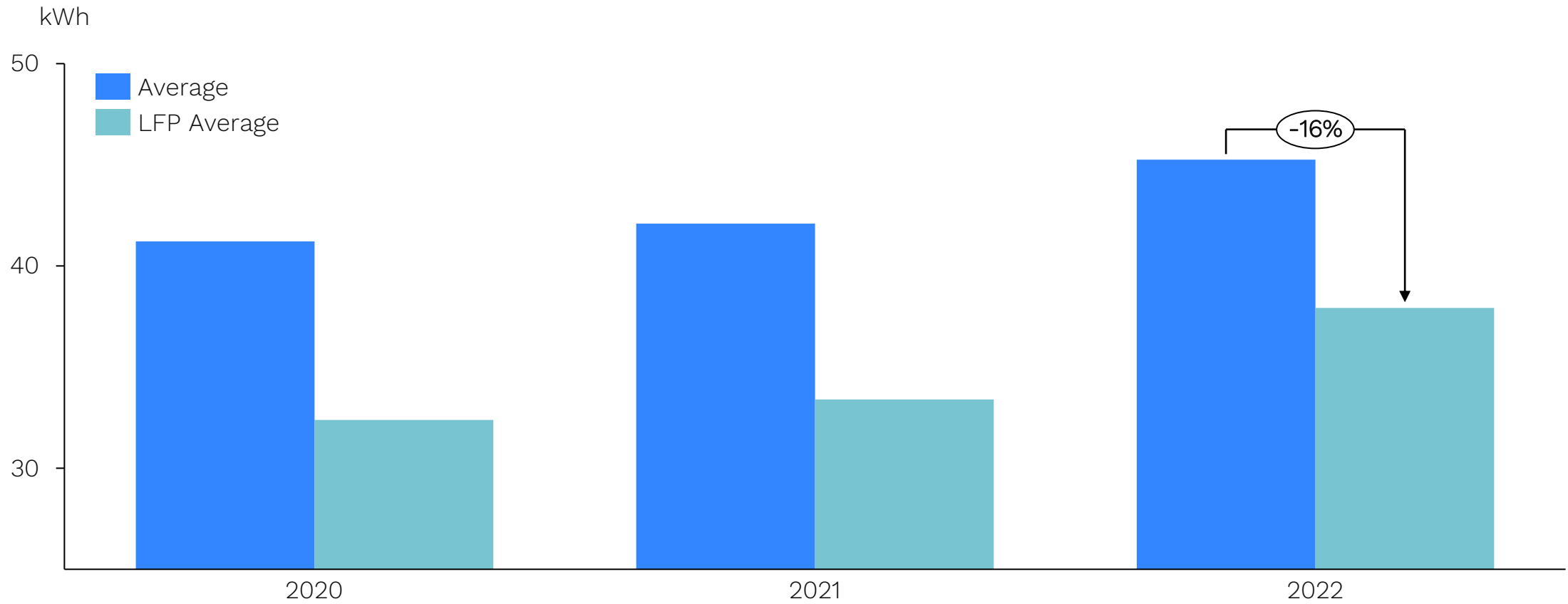


% of EV sales Battery demand chemistry split, 2022

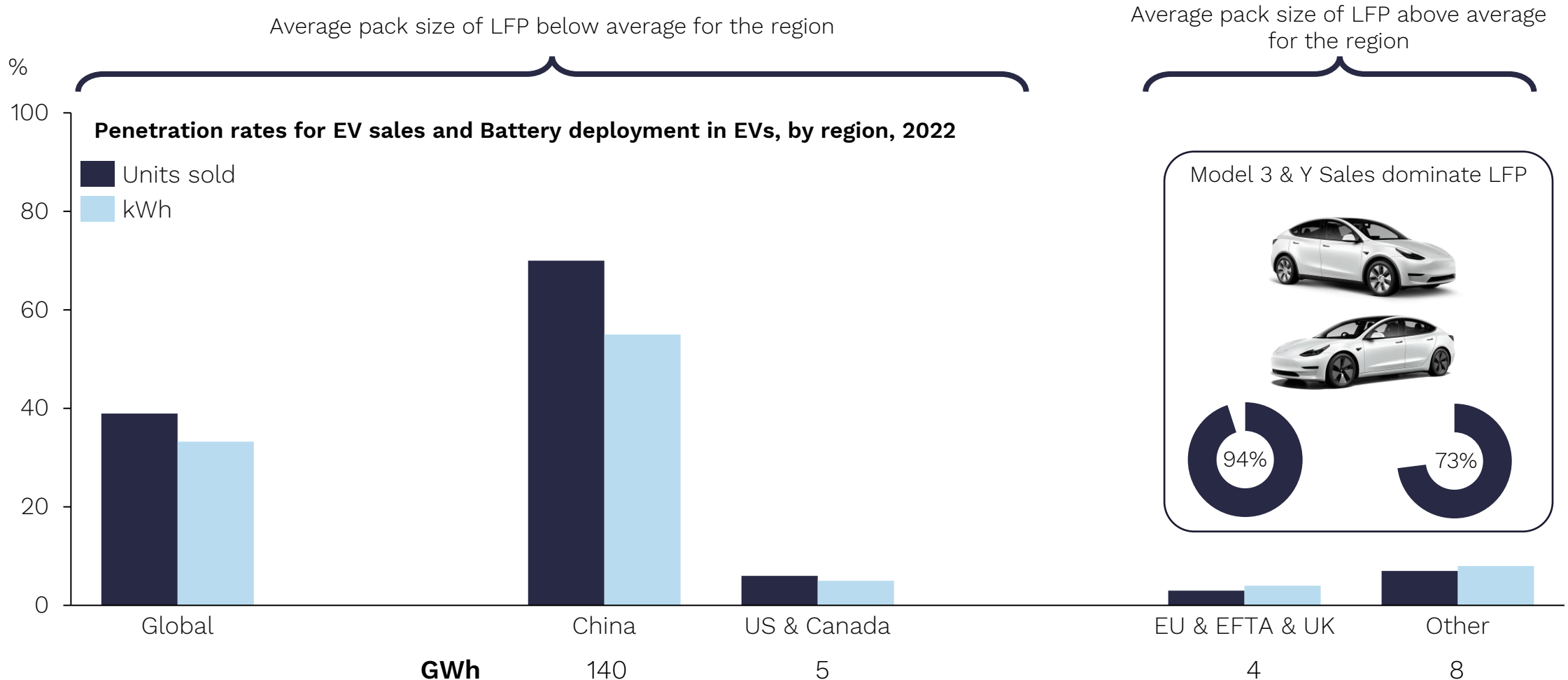


Average pack sizes are smaller for LFP for nearly every vehicle segment in which it appears

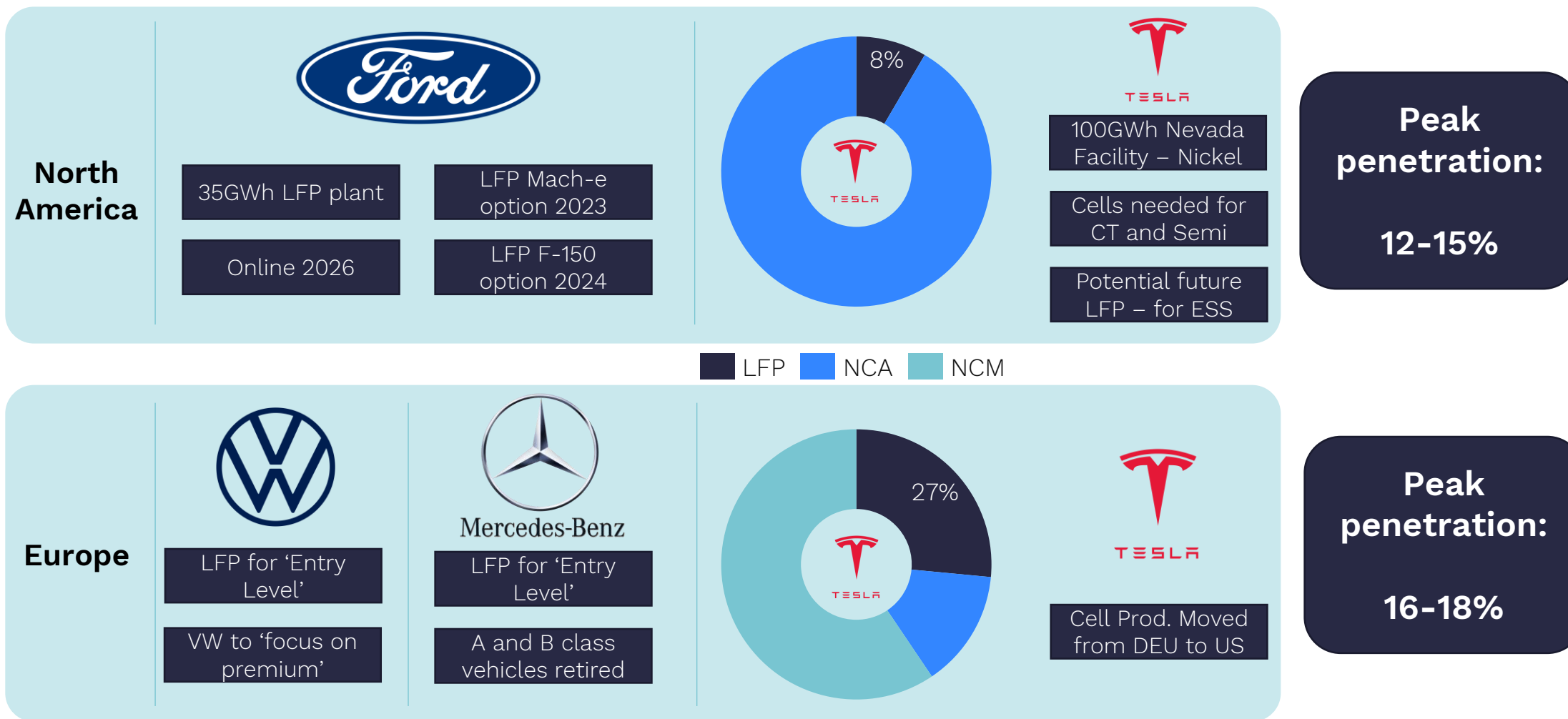
Average pack size comparison: LFP vs all Chemistries



LFP penetration in vehicle sales is higher than in battery deployment, heavily weighted by China

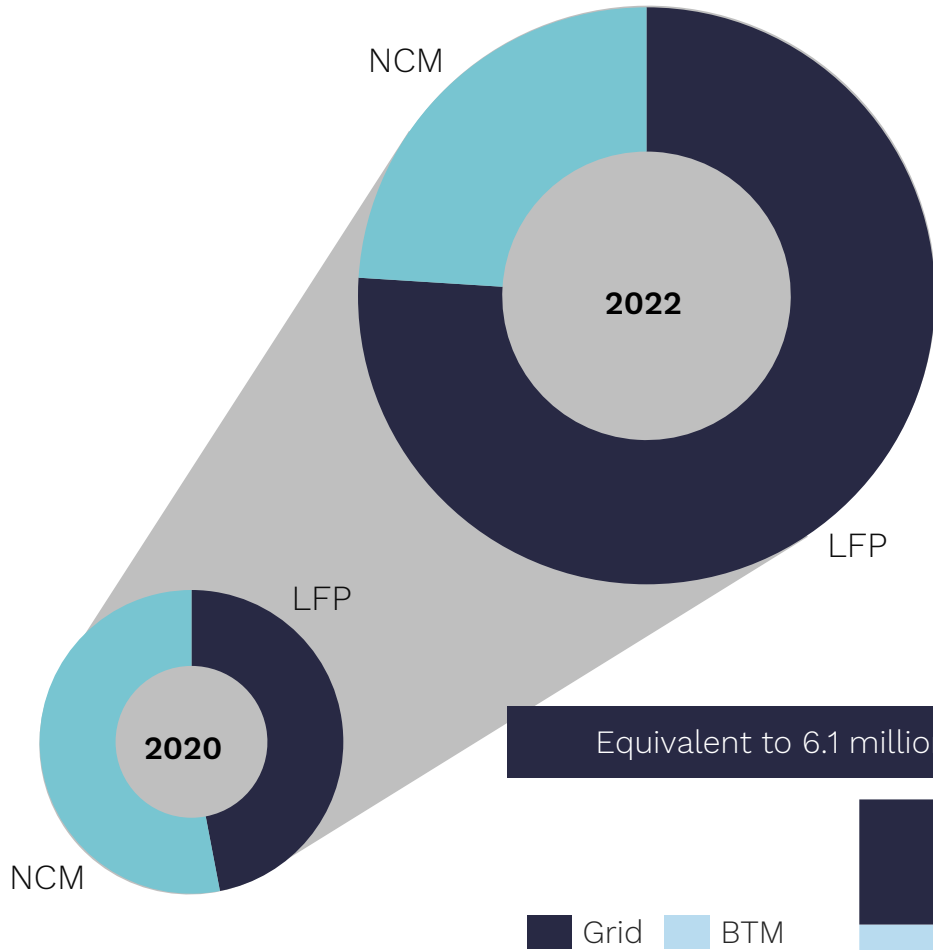
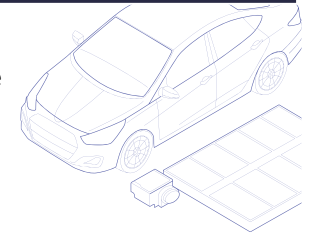


LFP adoption in Europe and North America

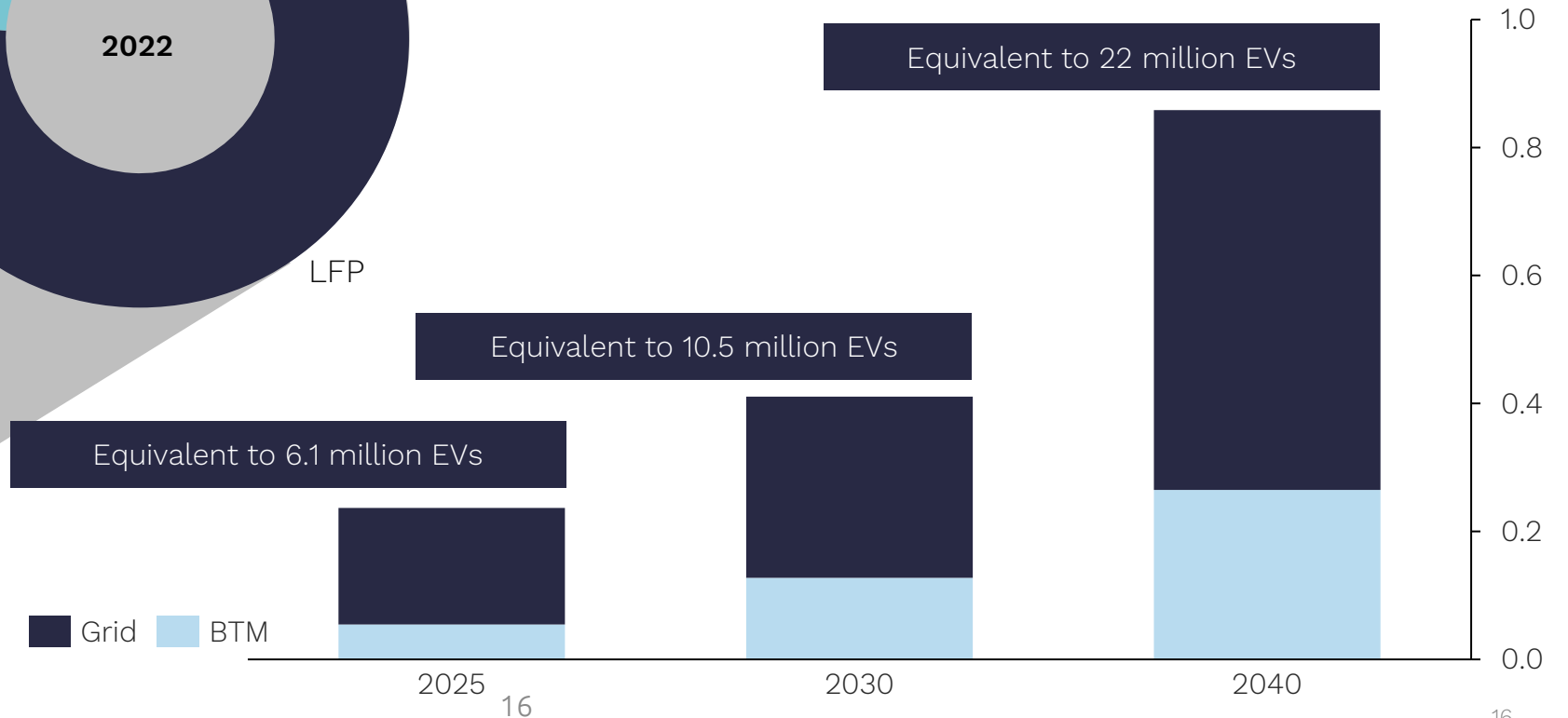


ESS Battery demand is ~10-15% relative to the EV market and is quickly moving to LFP

*Calculations based on 39kWh average pack size



BESS Grid & BTM annual installations

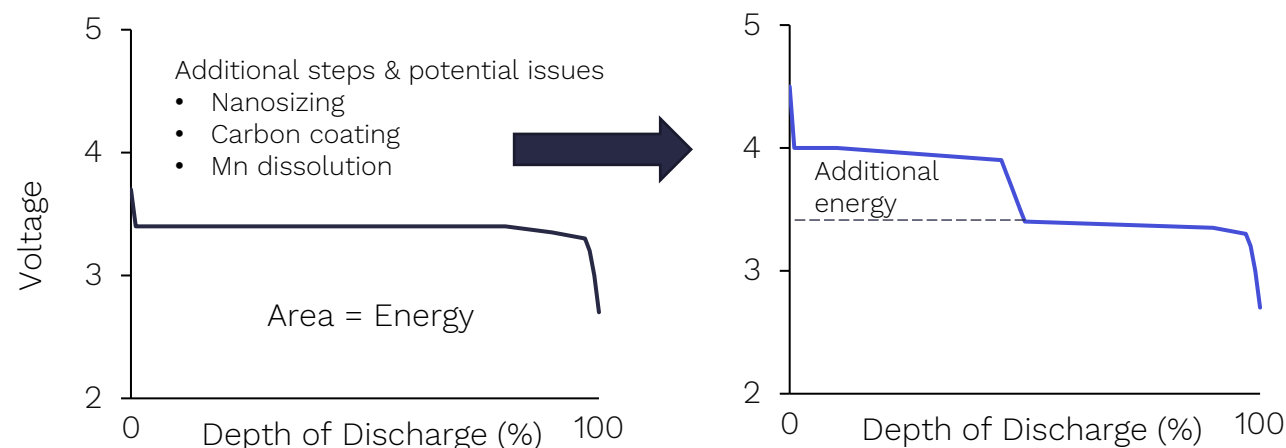


LMFP technology spotlight

Next Generation LFP

- This quarter we have split out LMFP in the cathode chemistry forecast on the back of increased interest and announcements from cell manufacturers and OEMs.
- LFP is favoured by Chinese cell manufacturers, with its benefits in safety, cost and cycle life. Whilst there has been advancements optimising cell-to-pack, like with the BYD Han blade module-less design (~140Wh/kg, 210Wh/L) there are still fundamental material limitations.
- The next opportunity is represented by $\text{LiM}_x\text{Fe}_{1-x}\text{PO}_4$ (LxFP), where iron (Fe) is partially substituted by other metals such as Mn, Zn and Al. CATL has claimed that M3P is ready for mass-production in 2023 and aims to supply the ~700km range BEVs with M3P cells in CTP 3.0 (Qilin) battery packs.
- In preparation for the future demand, CAM suppliers, such as Easpring and Dynanonic, have started to invest in LMFP cathode material projects.

Energy improvements – LFP (left) vs. LMFP (right)



Next Generation LFP cells – Short term, roadmaps



Planned 2023, 60-80% Mn, Targeting ~ 400-500Wh/L.



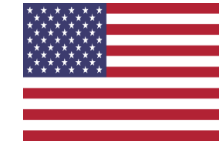
M3P, more complex than LMFP, doped with 2 metals (including Mn, Zn, Al). Aiming for 210-230Wh/kg.

SUNWODA



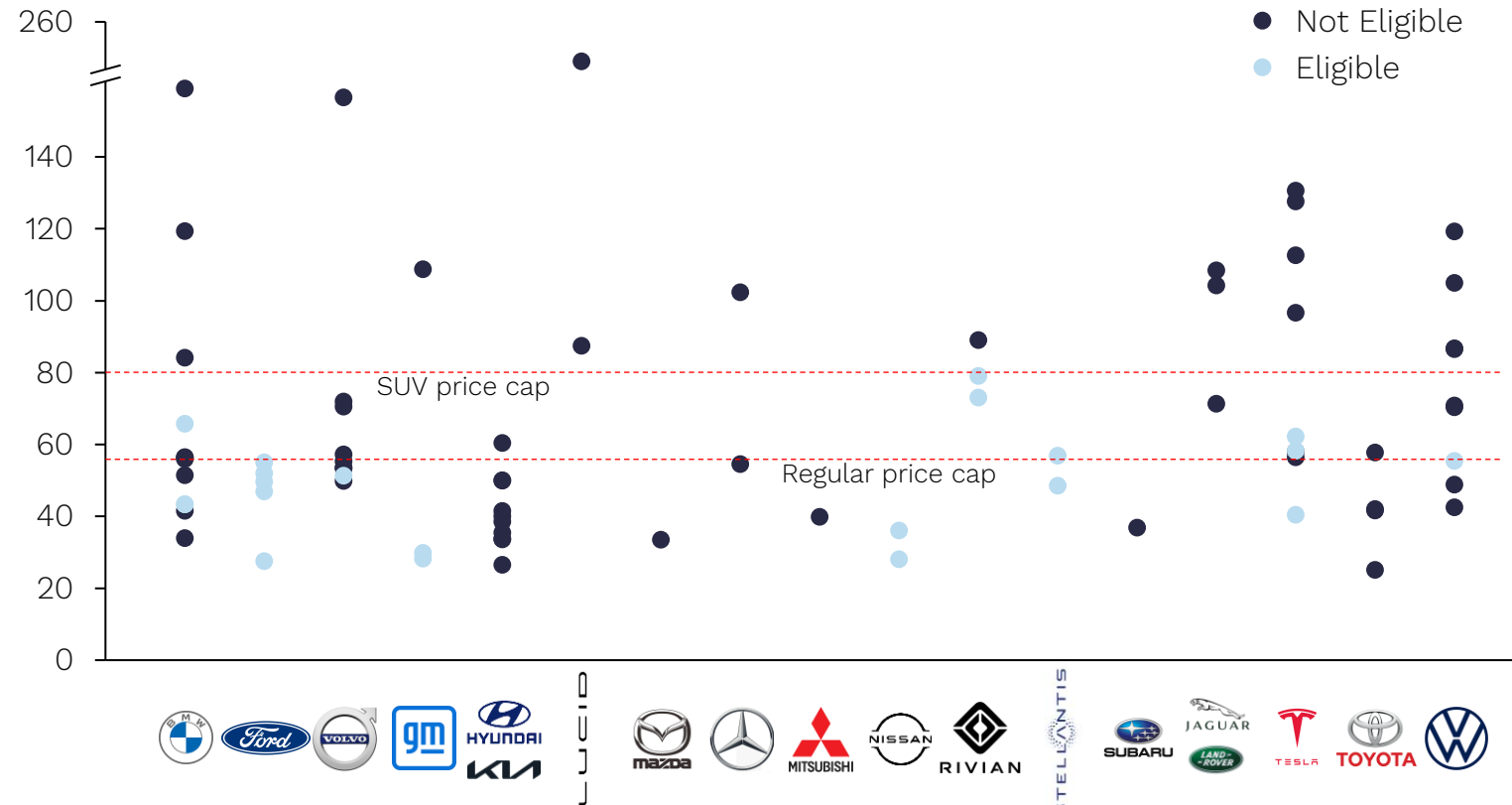
Others working on development of LMFP cells, some pilot production,

US Bipartisan Infrastructure Law and Inflation Reduction Act



EV purchase price by OEM and IRA eligibility

Vehicle price, USD '000 Based on just the assembly location and vehicle price criteria a majority of EVs on sale in the US right now will not be eligible for the new tax credits under the IRA



20 companies awarded USD2.8 billion funding from the Infrastructure Law

Metal concentrates, salts



Cathode precursors



Recycling



Electrodes, binder, separator, electrolyte



NMC, LFP cathode active materials



Graphite anode active materials



Silicon anode active materials



Projects could provide:

Lithium	2 million EVs
Graphite	1.2 million EVs
Nickel	400,000 EVs
Binder	45% US demand

Source DoE

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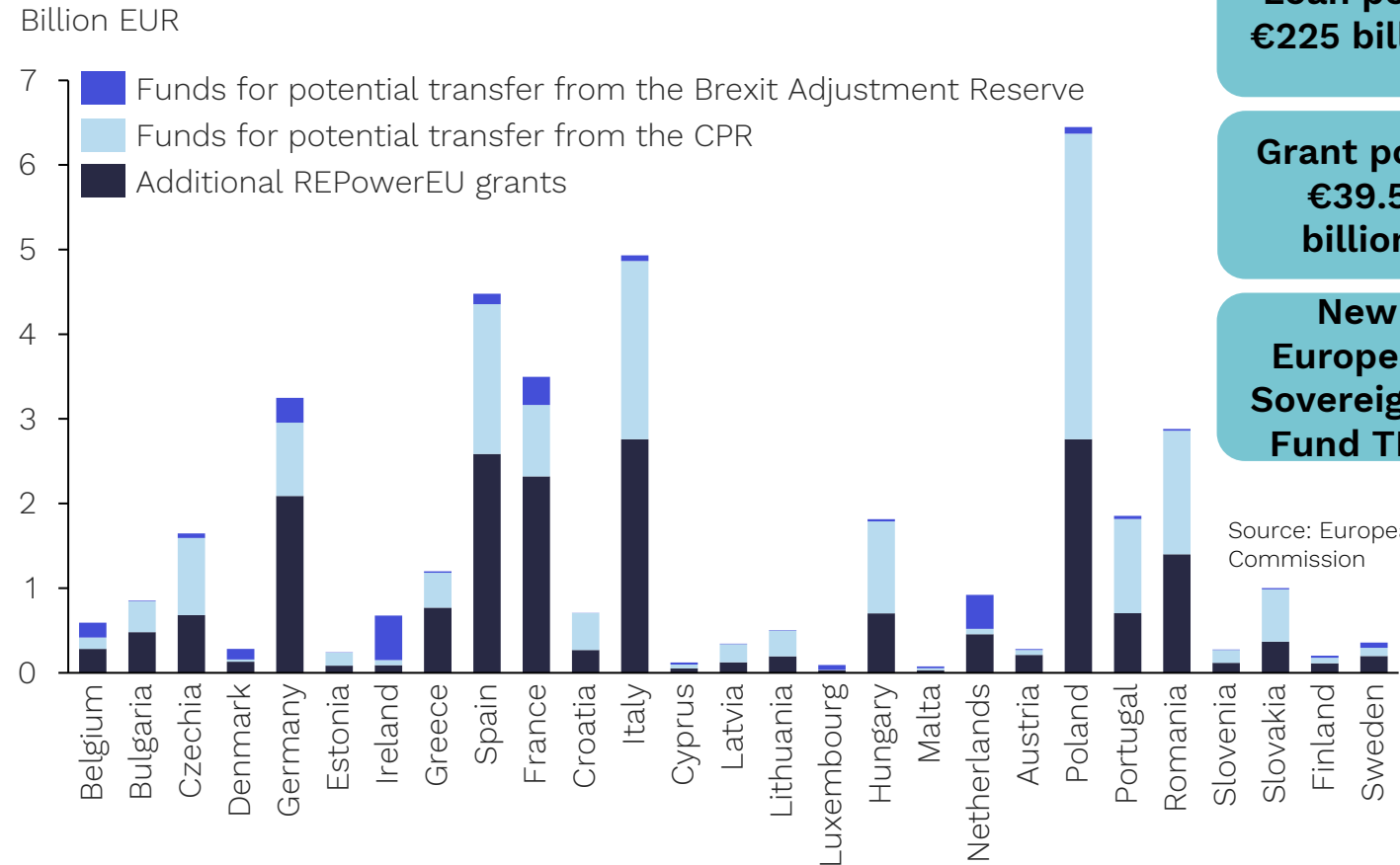
Europe responds to the IRA



The Four Pillars of the Green Deal Industrial Plan

- Simplify the regulatory environment – ease of **permitting**
- **Financing** through grants and loans
- Enhancing **skills** for net-zero related industries
- Facilitate open and fair **trade** to build supply chains

New Guidance of access to REPowerEU funds, by Member State



Loan pool:
€225 billion

Grant pool:
€39.5 billion

New European
Sovereignty
Fund TBA

Source: European Commission

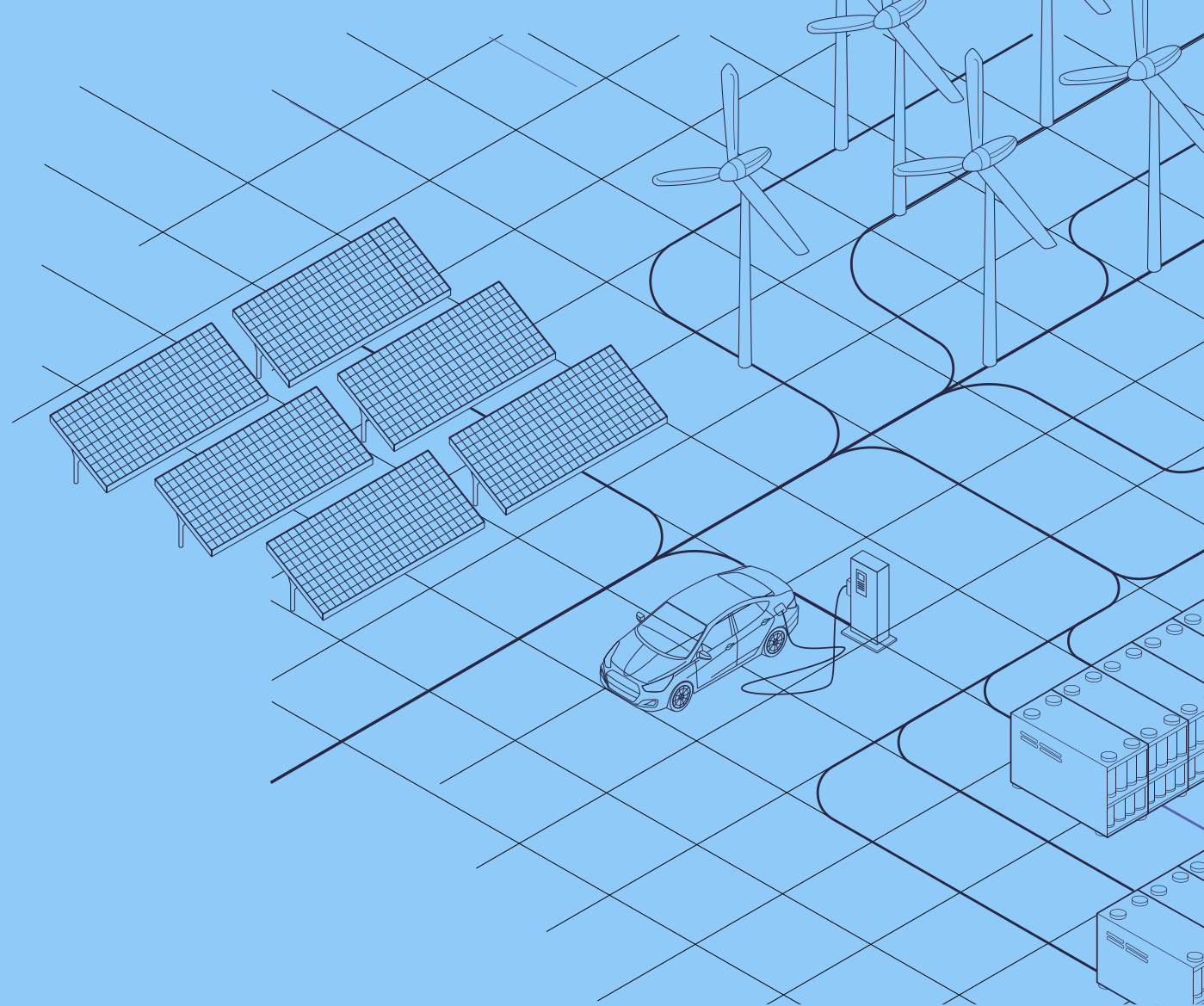
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Any Questions?

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