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Challenges & industrial needs

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NMC versus LFP

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Ford Hints At LFP Battery Version Of Its Electric Vehicles

LFP batteries might be utilized in current generation models.

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AUTO · Published November 15, 2022 5:47pm EST

Auto makers shift to lower-cost batteries for electric vehicles

The iron-based batteries are commonly used in China, but there are trade-offs

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The EV battery chemistry debate just got more complicated

The sharp rise in battery raw material prices has amplified the cost difference between nickel-based CAMs and LFP, increasing interest in LFP-powered electric vehicles

Company	Date	Attitude towards LFP batteries
Renault	Feb - 2021	In order to be able to plan mass production in 2023, Renault 5 is considering the use of LFP batteries
Volkswagen	Mar - 2021	In the future, it will use LFP batteries on entry-level models and will be one of the main battery routes for its platform
Hyundai	H1 - 2021	Has started to develop EV's equipped with LFP batteries, which will be sold outside China
Tesla	Oct - 2021	For Standard Range Model 3 and Model Y vehicles, it will switch to LFP batteries globally
Daimler	Oct - 2021	Its luxury car brand Mercedes-Benz is considering LFP batteries in entry-level models
Toyota	Dec - 2021	It is planned to launch a small EV equipped with BYD's blade-type LFP battery for the Chinese market in 2022
Ford	Feb - 2022	Visited BYD's Xi'an Fudi XAB plant as "No. 1 customer" and considered using LFP batteries in large quantities on entry-level models worldwide

Shift to LFP

Mercedes and Stellantis pause EU battery factories, may switch to LFP cells

Jameson Dow | Jun 4 2024 - 2:05 pm PT | 14 Comments

Industrial needs & challenges

- Lithium metal cost upscaling and cost efficient manufacturing technologies

Step #1: Silicon-carbon composite anode

- High capacity allowing for 200+ Wh/kg cells
- Abundant & low-cost

Step #2: Lithium metal anode

- High capacity allowing for 300+ Wh/kg cells
- ''Holy grail'' anode

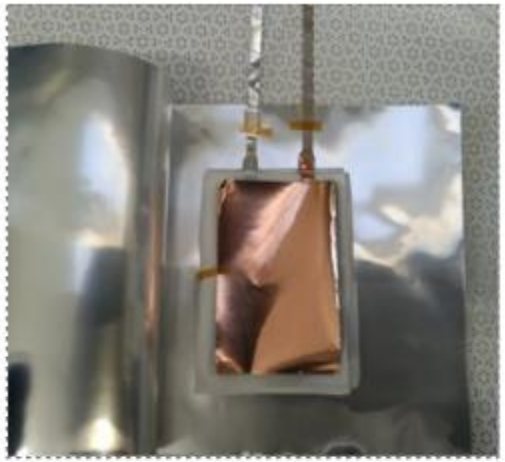
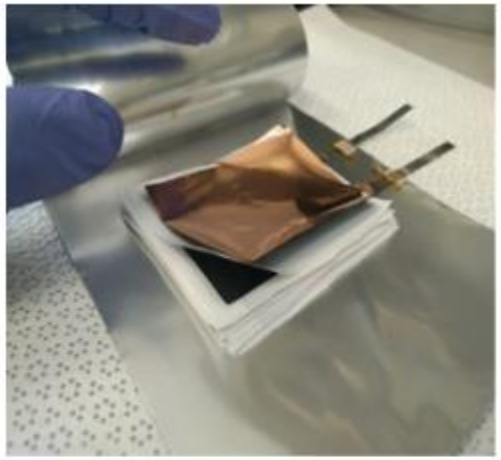
Both increase the specific energy of batteries

Both will find use for different applications

- Silicon for batteries in mass electrification
- Lithium for high-end batteries

Industrial needs & challenges

- Solid state battery cell upscaling & development of new equipment's (>TRL 6/7)

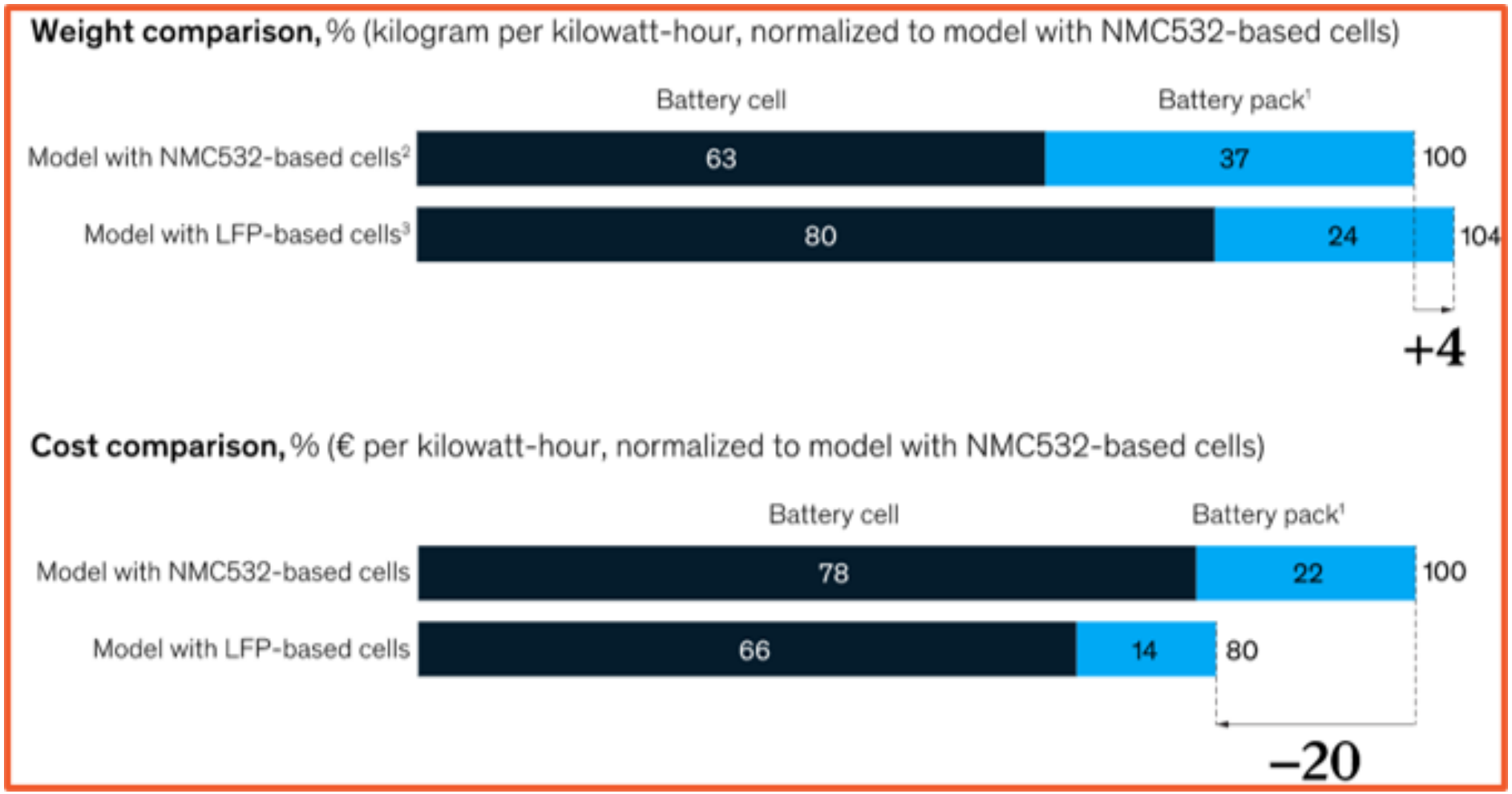
Optimisations are being done in pouch cell (low Ah) and will be transferred to prismatic layout when cell design is fixed

30 Ah pouch cell

100 Ah cell prismatic stacking

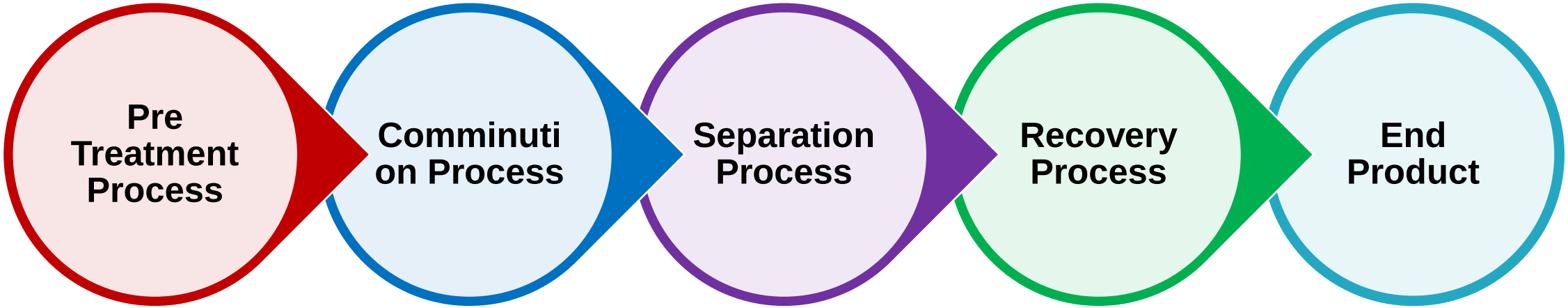
Industrial needs & challenges

- Next generation LFP/LFMP cathode materials for automotive and stationary applications



Industrial needs & challenges

➢ Novel recycling technologies for LFP based batteries



Pollution Control system
All process studied is performed under proper dry and wet pollution control system

Hazard and Safety Management
Electric, Chemical, Fire and Explosion hazard risks are priorly identified for each process by set of experts

Industrial needs & challenges

- Novel recycling technologies for LFP based batteries
- Largest LFP recycling plant in EU (20.000 tones/year)