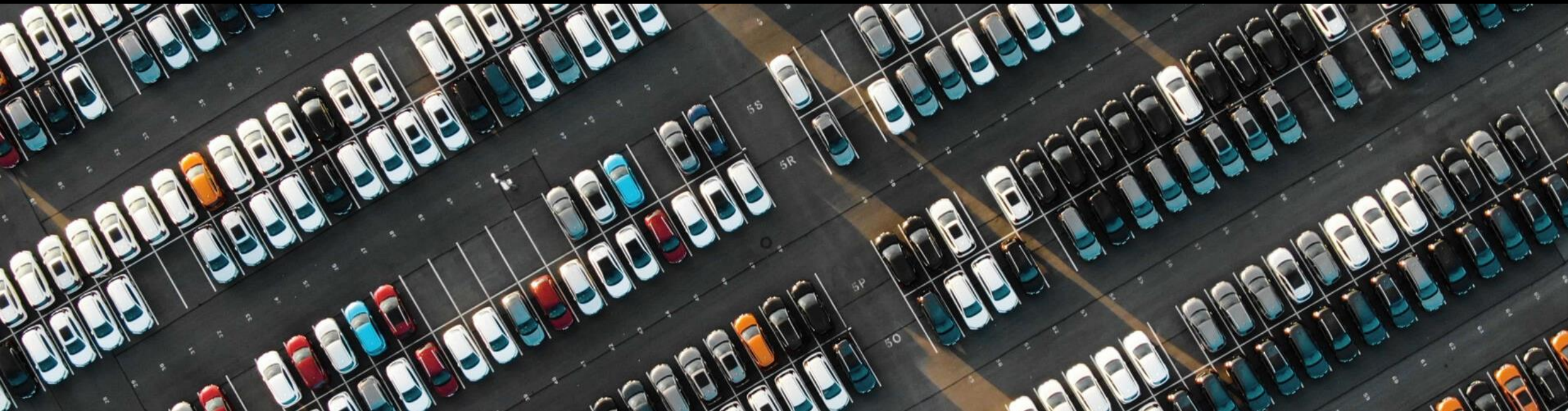


High-voltage battery recycling

Not if, but when and where?

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Technology & Aftermarket

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Contents

High-voltage battery recycling: Not if but when and where?

Get more details on the high-voltage battery recycling study from S&P Global Mobility.



Why does battery recycling matter?



Who are key players?

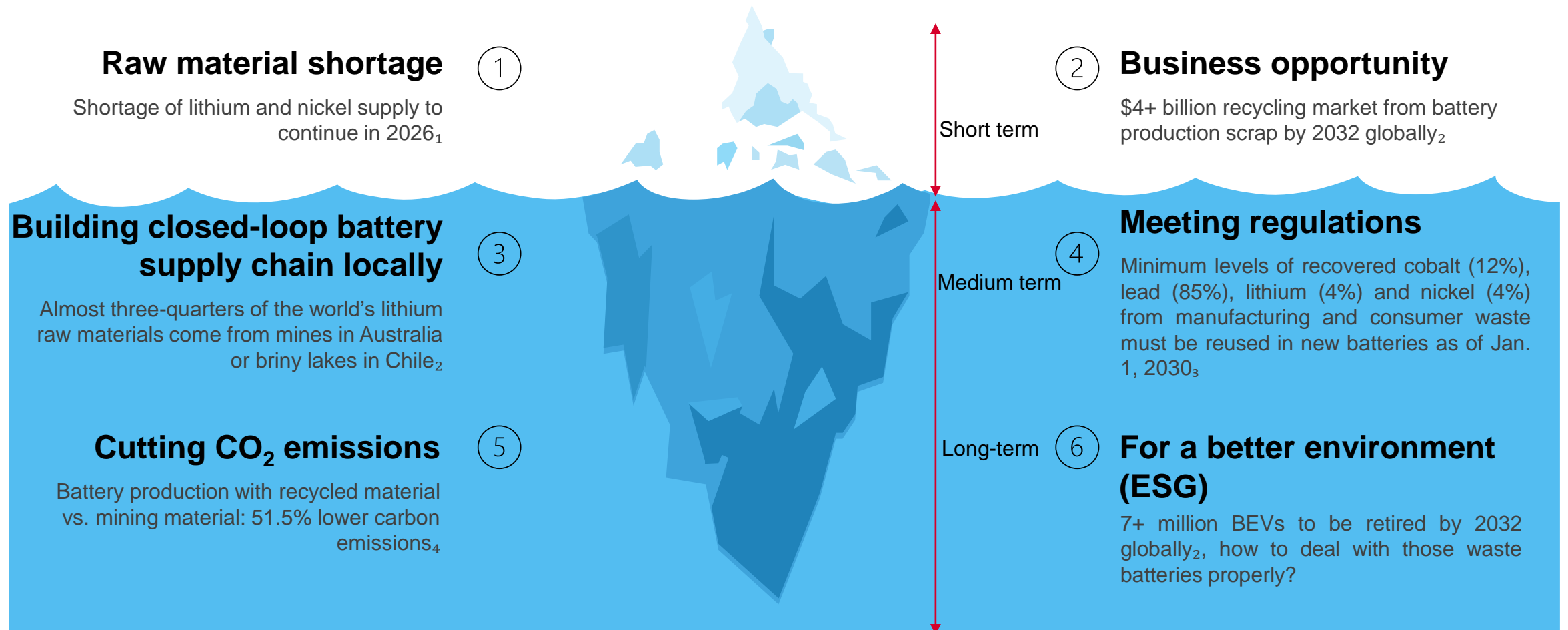


When will end-of-life batteries exceed battery production scrap?



Where are business opportunities?

Why does battery recycling matter?



Source:

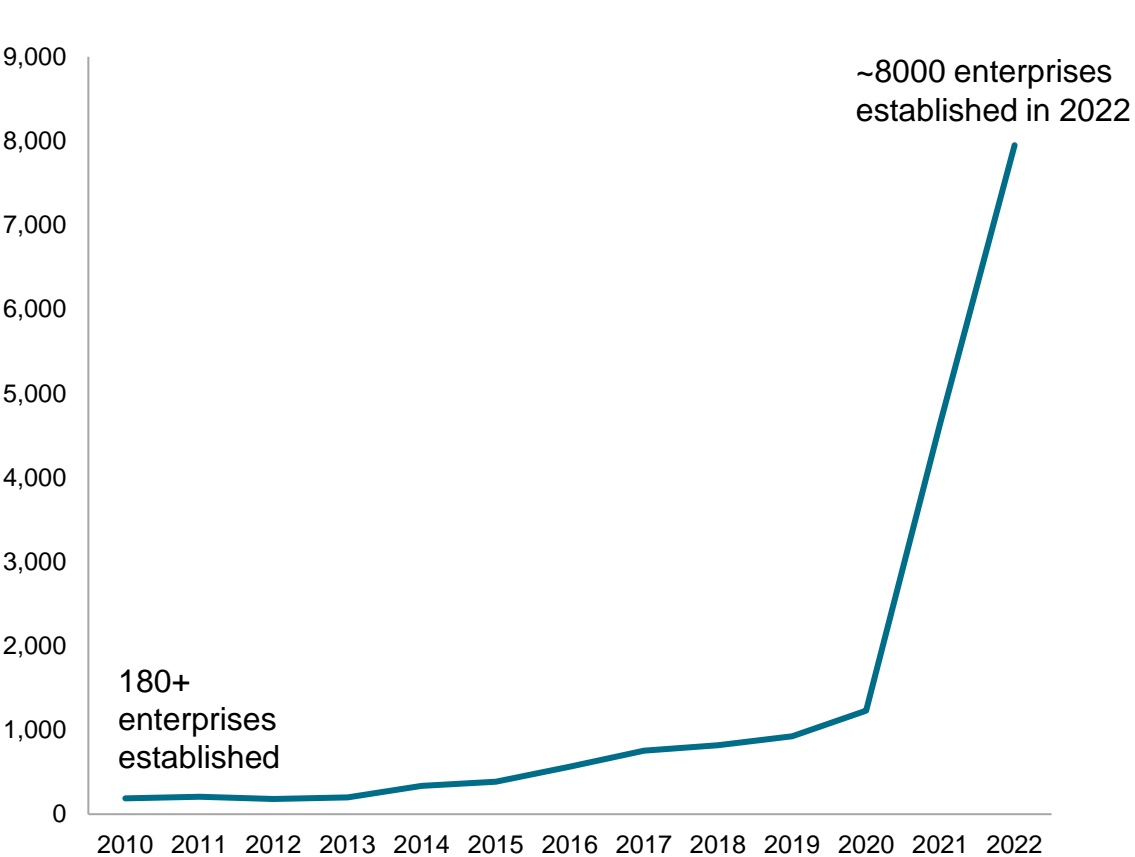
1. S&P Global Market Intelligence; 2. S&P Global Mobility; 3. [New EU regulatory framework for batteries](#)

4. [Investigating carbon footprint and carbon reduction potential using a cradle-to-cradle LCA approach on lithium-ion batteries for electric vehicles in China](#)

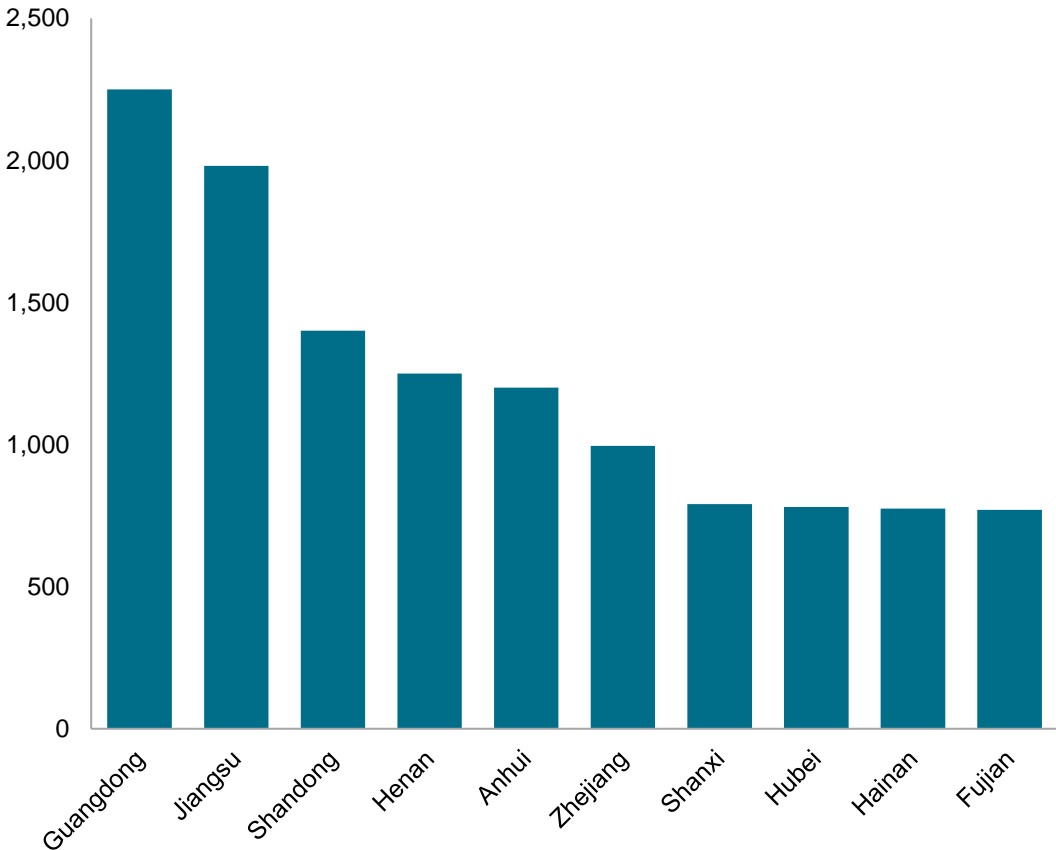
Fierce competition in Chinese battery recycling market

Over 20,000 enterprises will grab 47 GWh production scrap in China in 2023

Number of HVB recycling enterprises established per year in China



Chinese HVB recycling enterprises by province



Data compiled February 2023.
Keywords include high-voltage battery recycling, registration fee > CNY10 million.
Source: Tianyancha.

Global snapshot of legislation activity

North America



Europe



Greater China



Japan/South Korea



We found dominant material providers and recyclers in the recycling market of Europe:

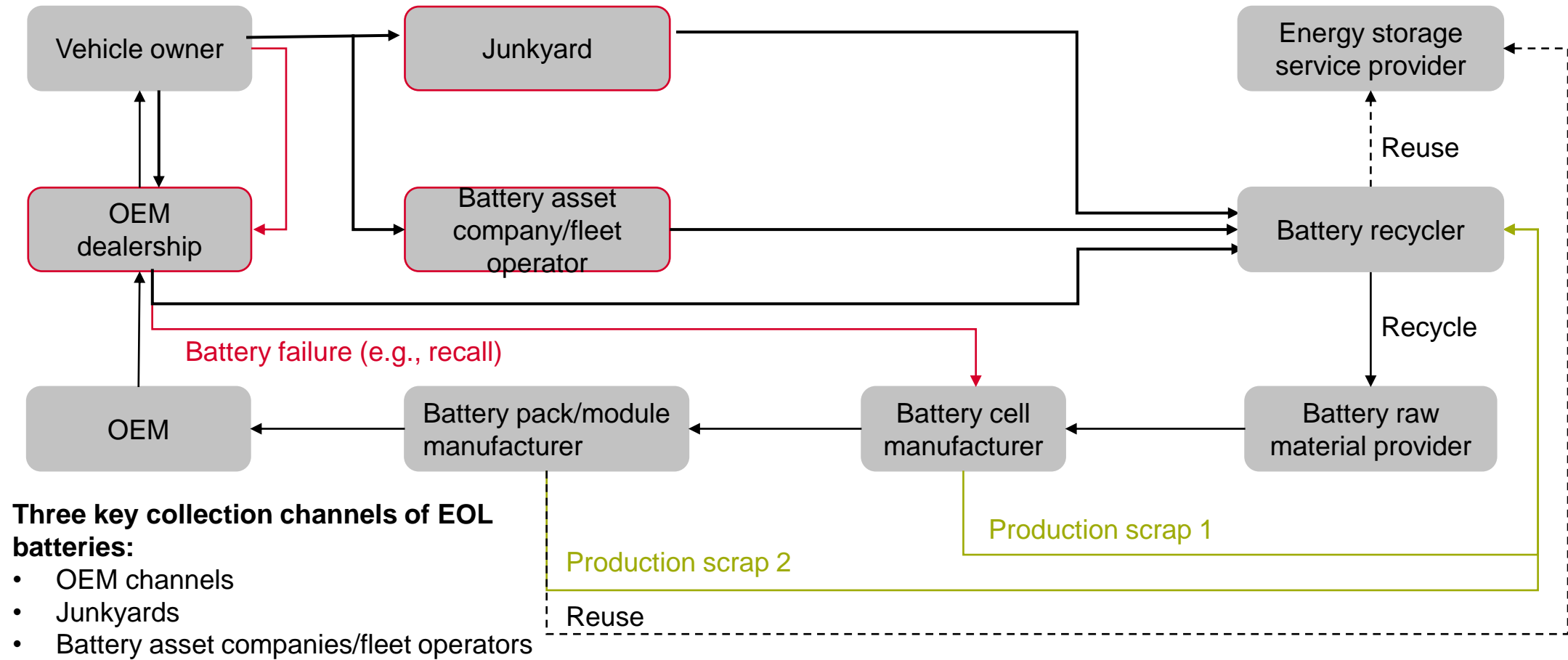


Data compiled: February 2023.
Keywords include high-voltage battery recycling, registration fee > CNY10 million.
Source: Tianyancha.

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Who are the key players?

Diverse channels for collecting end-of-life (EOL) batteries are crucial

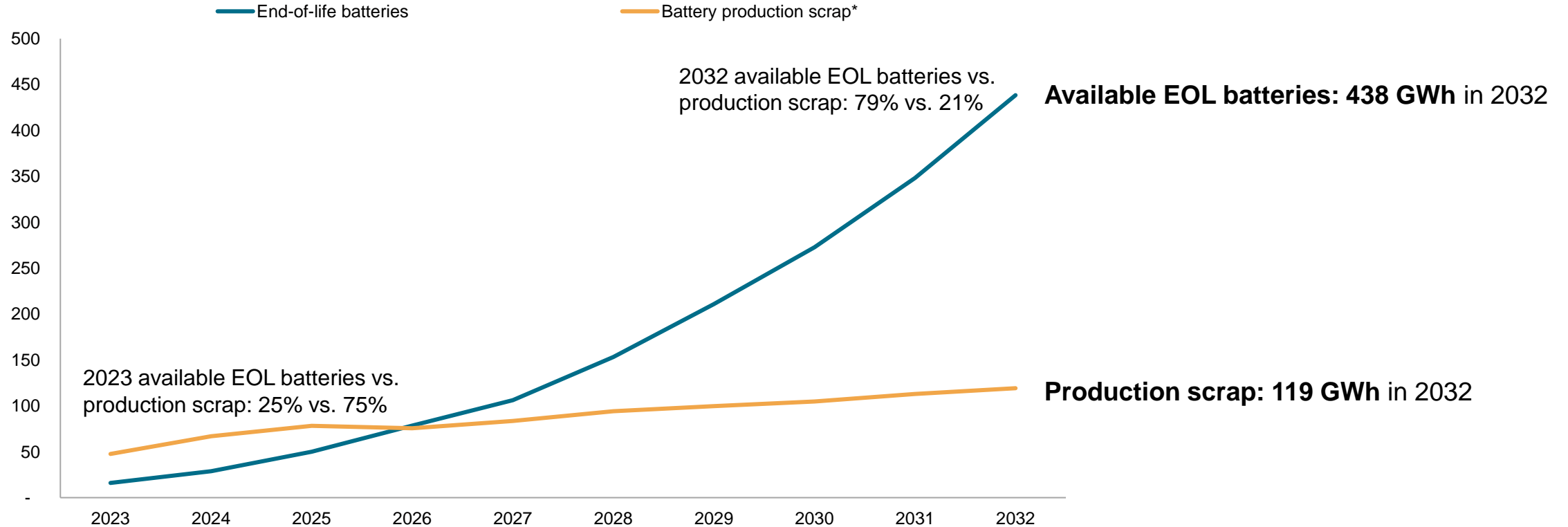


Source: S&P Global Mobility

When will available EOL batteries exceed battery production scrap?

In Greater China, available EOL batteries will exceed battery production scrap starting 2026

Greater China's available end-of-life batteries vs. total production scrap (GWh)



Data compiled June 2023

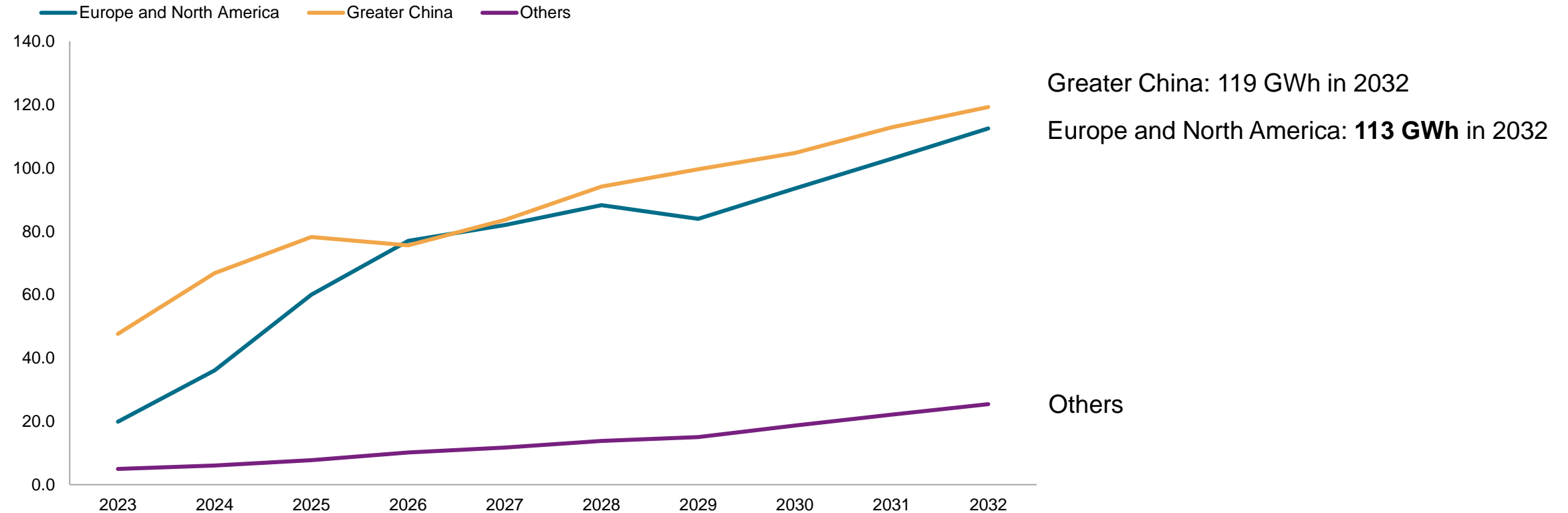
Battery production scrap includes cell production, pack production and module production.

Source: S&P Global Mobility.

Where are business opportunities present?

Fast growth of battery production scrap in Europe and North America

Global battery production scrap per region (GWh)



Data compiled June 2023

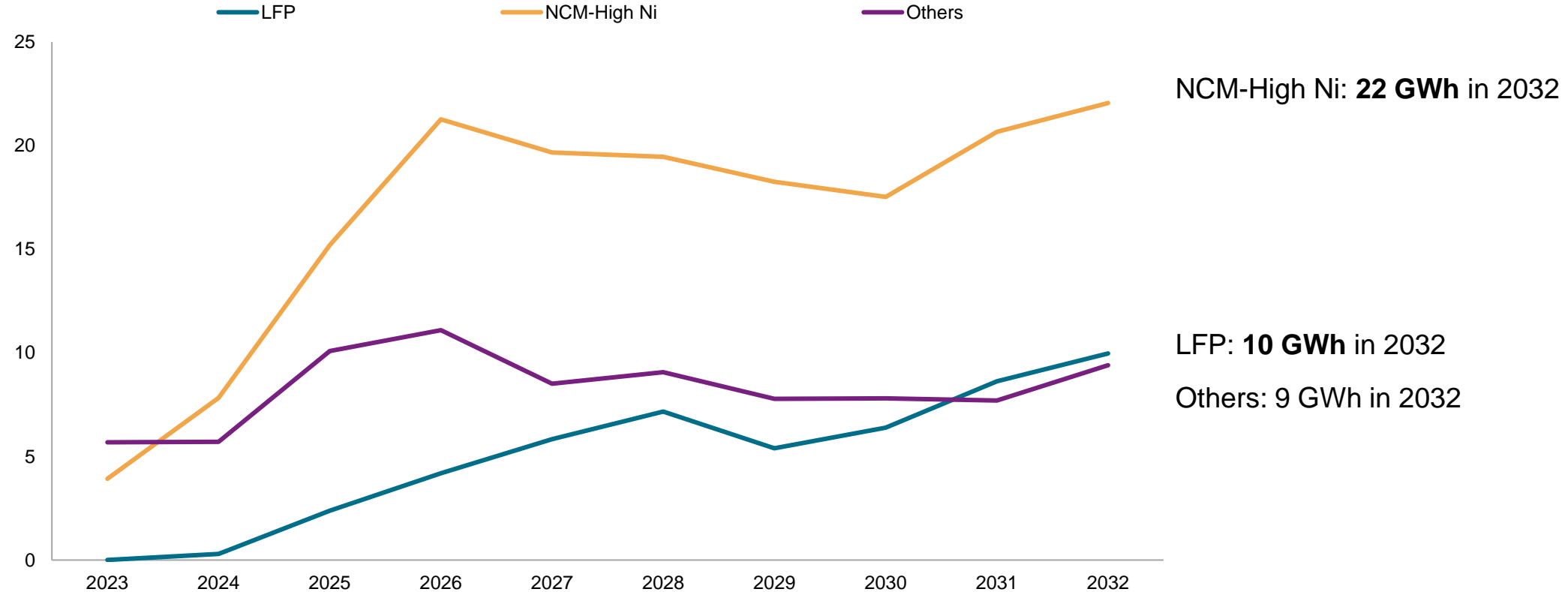
Battery production scrap includes cell production, pack production and module production.

Source: S&P Global Mobility.

Where are business opportunities present?

High potential demand on LFP recycling facilities in Europe

Europe's available battery cell production scrap by cathode material (GWh)



Data compiled March 2023
Source: S&P Global Mobility.

Where are business opportunities present?

The need for autonomous disassembly capacity grows due to increasing dismantling complexity

Dismantling: Includes disassembling the battery pack into cell or modules

The level of difficulty of the dismantling process varies depending on the module configuration:

- **Cell module pack:** Has the easiest dismantling process. The adhesion force of the thermal paste affects the complexity of the removal of the modules.
- **Cell pack:** Cells are directly assembled to the pack, which makes it harder to be dismantled.
- **Cell body:** The most challenging configuration as the battery cells are directly assembled to the body.

Cell module pack



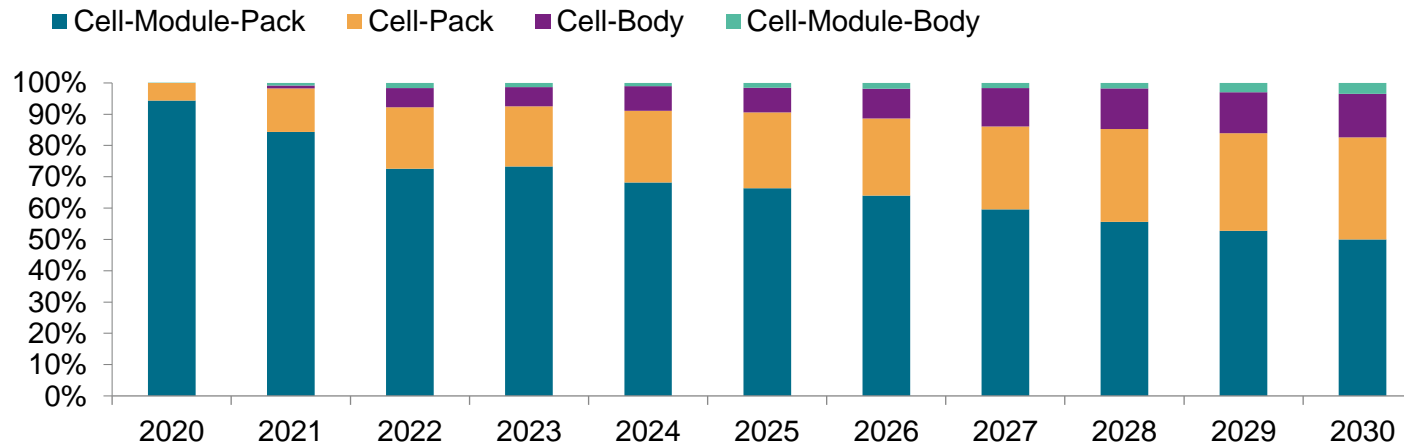
Picture source: Nio

Cell pack



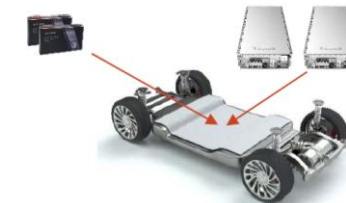
Picture source: BYD

Share of different cell, module, pack configurations of light-duty battery-electric vehicles



Source: S&P Global Mobility, AutoTechInsight, High Voltage Battery forecast, October 2022

Cell body



Picture source: Morgan Advanced Materials, Borgwarner, Samsung SDI

High-voltage battery recycling study overview

- **Topic coverage**

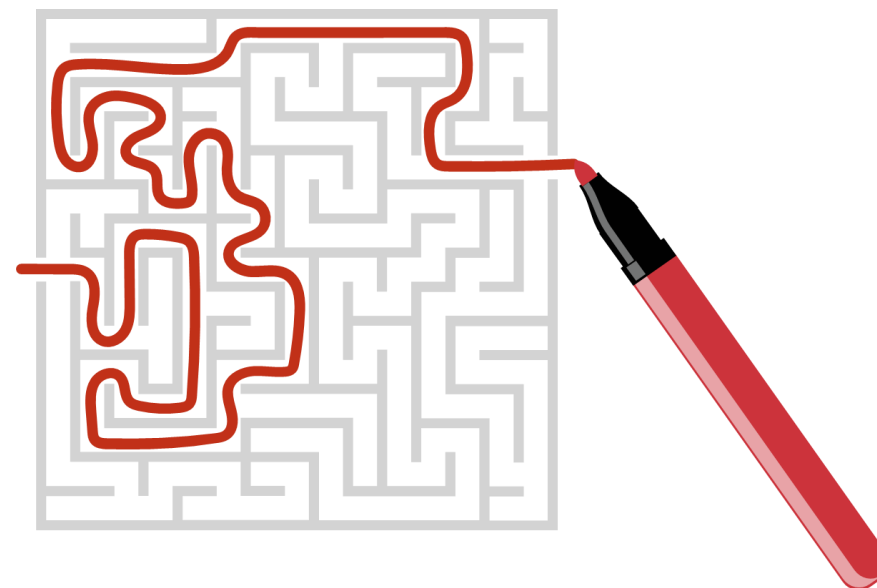
- Policy and regulation analysis
- Recycling supply chain analysis
- Available battery production scrap forecast (2023–32)
- Available end-of-life battery forecast (2023–32)

- **Region coverage**

- Europe
- Greater China
- North America

- **Research value**

- Develop battery recycling strategy
- Compare local policies and business models
- Build/localize battery recycling partnership
- Estimate market size to support strategic decision
- Identify business opportunities



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