McKinsey & Company

# Masterplan for the European Automotive Industry

CWIEME, Berlin

May 14, 2024

# The automotive industry has been a success story for the European economy in the past decades

### Prosperity and growth

**~7%**

of EU GDP
(EUR >1 tn in 2022)

**€375 bn**

tax income in EU
major markets

### Employment

**13.8 mn**

jobs in auto industry
(6.1% of total
EU employment)

**~11.5 %**

of total EU manufacturing
employment

### Innovation

**~30%**

of Auto patents stem
from the EU

**€~60 bn**

spend on R&D p.a.
(~30% of total EU R&D spend)

### Shaping EU image

**€ >200 bn**

brand value of EU top 10 auto
companies (#1 sector with 11.7%
of total EU brand value)

**Signature industry** for
European image of innovation
and quality (e.g., „Made in
Germany“)

# The largest transformation in automotive history

## Technology

From ICE

to ZEV

**80% p.a.**

of EV sales growth over past 3 years

## Customer

From Hardware focus

to Software differentiation

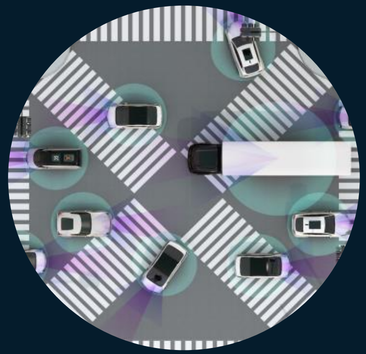
**2-3x**

software content per vehicle since 2015

## Industry

From established supply chains

to new ecosystems with entirely new players

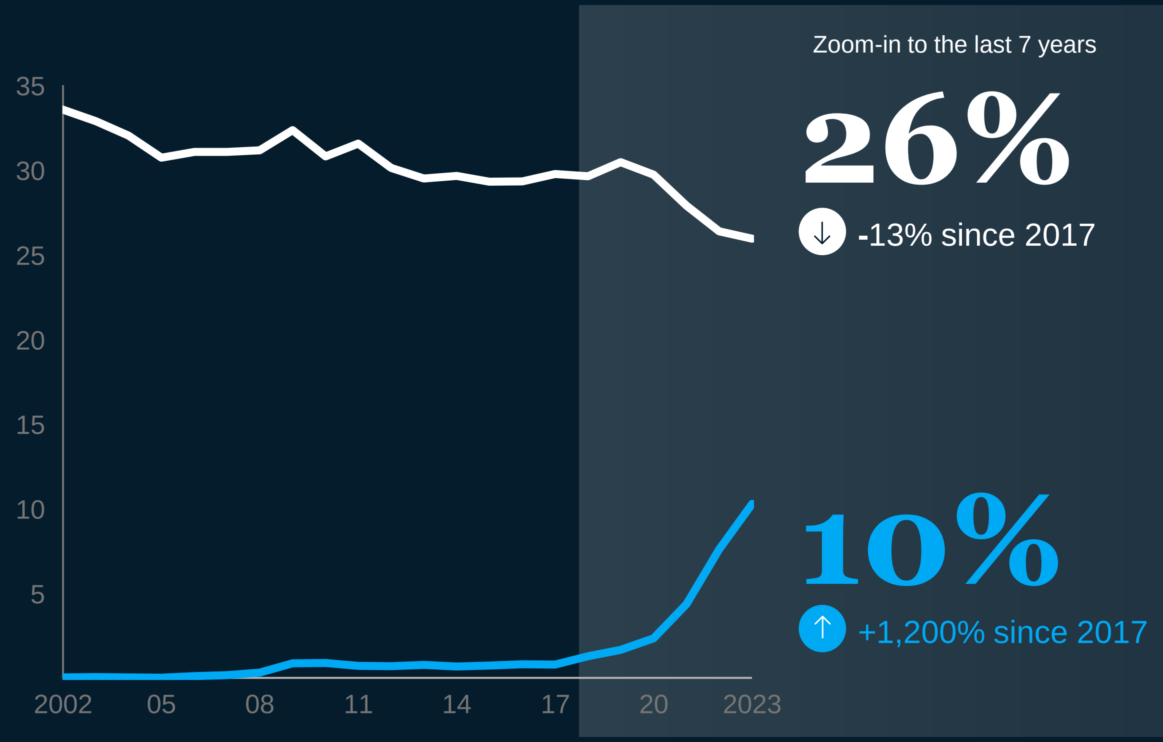


**40%**

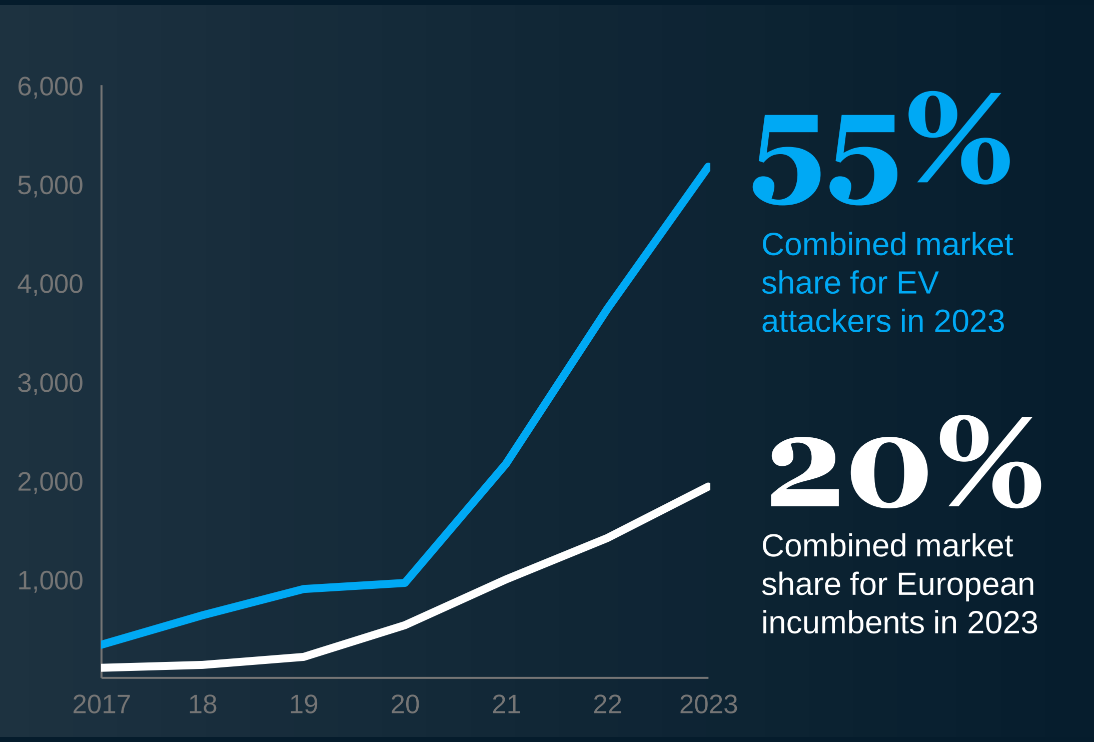
of vehicle value split stems from battery, no European players among top 10 suppliers

# European OEMs are increasingly losing market share – while disruptors are dominating the BEV market

## Global market share passenger cars
in percent of sales

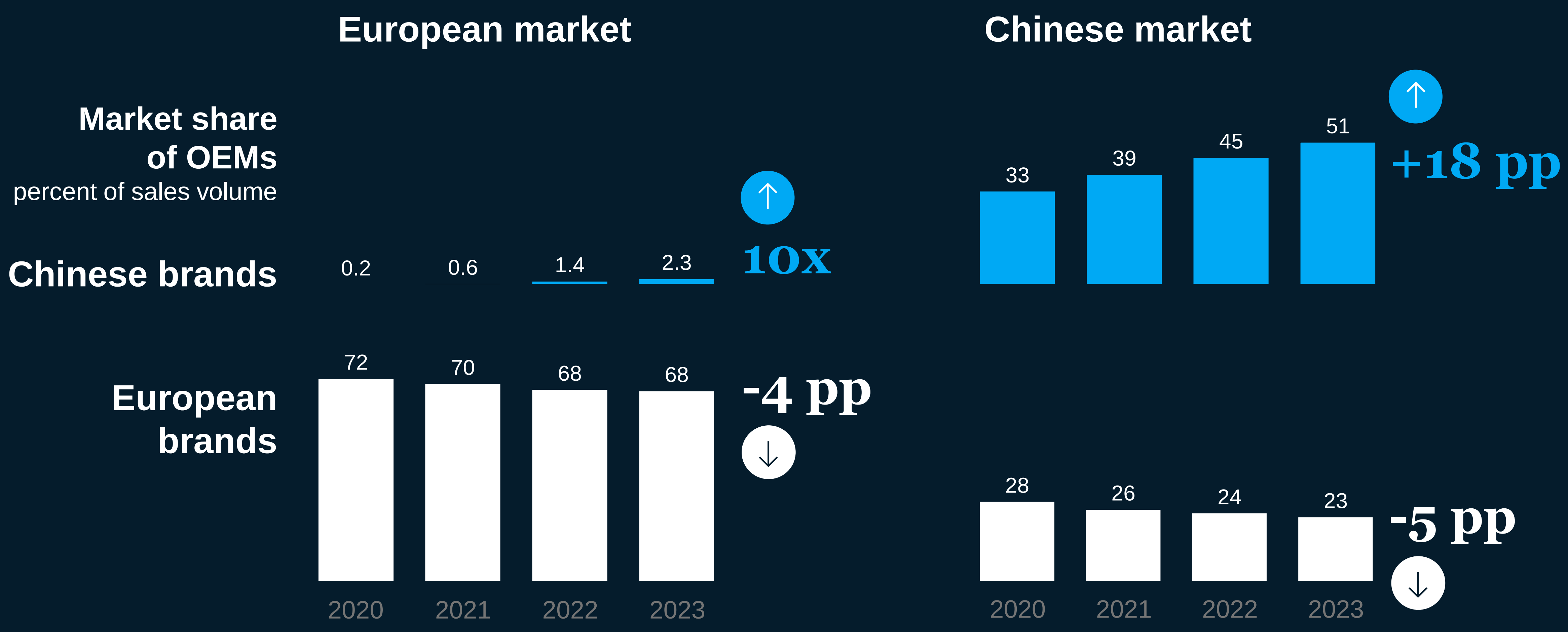



## Zoom in: BEV sales
thousand sales units




European incumbents EV attackers

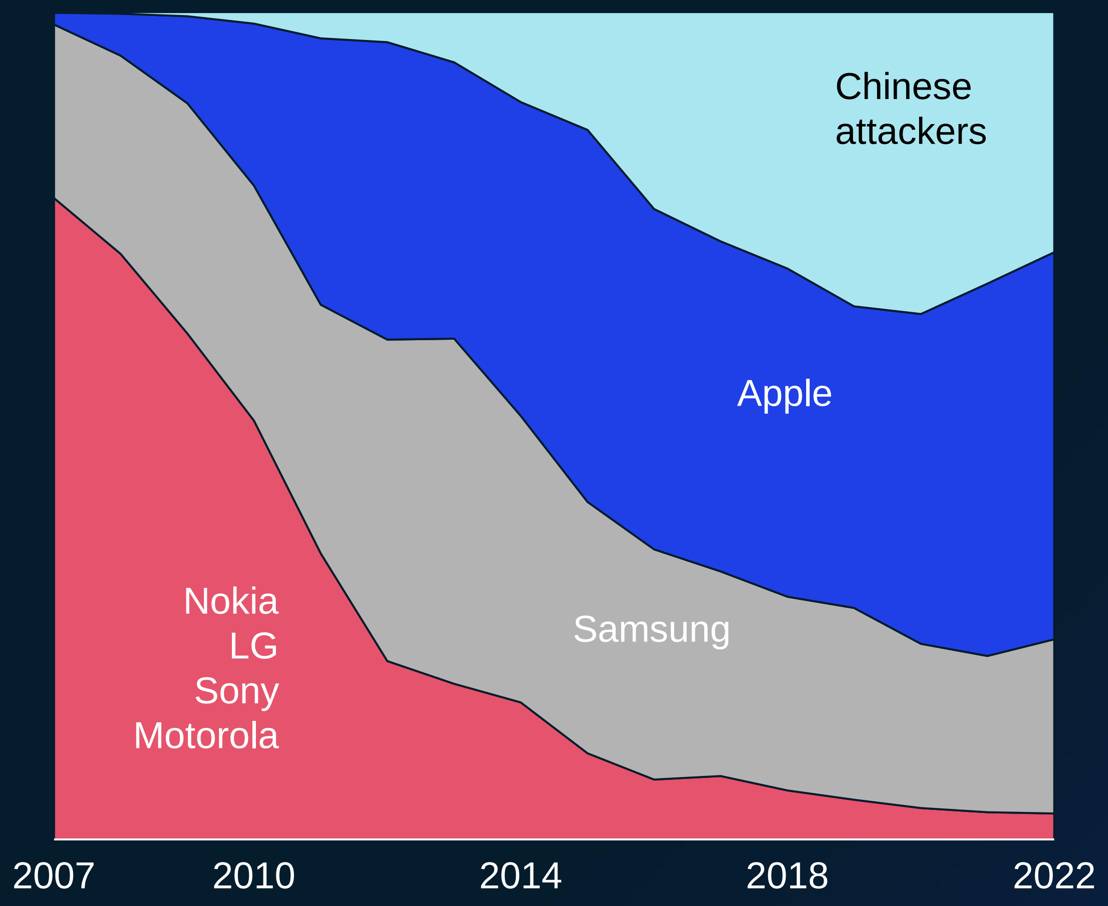
# European automotive OEMs are facing increasing pressure both in China and their home market



# Navigating disruption: lessons to be learned from Nokia and Samsung for future incumbents

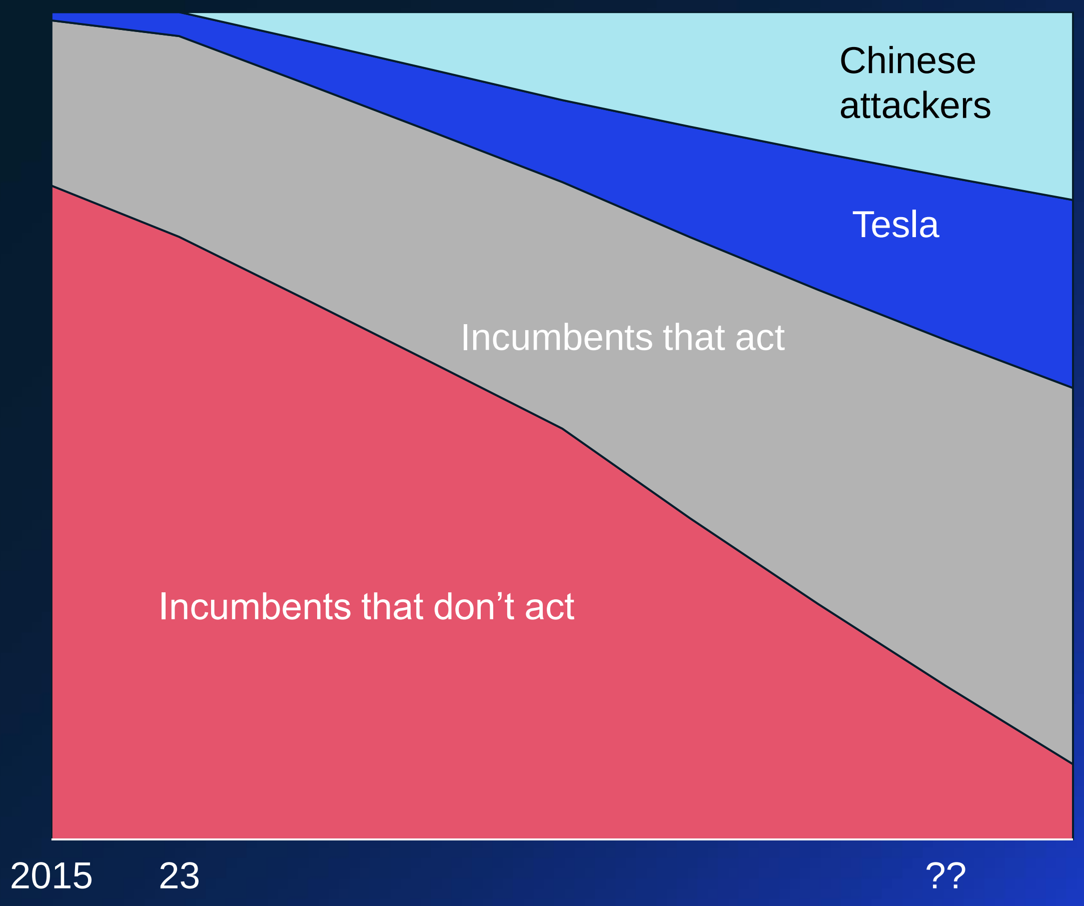
**Global Mobile Manufacturer Sales (Real market share by revenue)**

**iPhone launch in 2007**




**Auto OEMs** (Illustrative market share scenario)

**Model 3 launch in 2015**




Source: Public company records

# It's an ecosystem challenge along the new value chain – what was Europe for ICEs is China for BEVs today

**Global Lithium refining**
Capacity, 2021

**90%** vs. **0%**
China — Europe

**Global Li-ion battery cell production**
Share of supply, 2022

**71%** vs. **11%**
China — Europe

**Global EV production**
Share, 2022

**66%** vs. **17%**
China — Europe

**Global semiconductor production**
Capacity 300mm wafers, 2023

**26%** vs. **10%**
Greater China — Europe

**Share of global top-20 tech firms**
Market share 2022, $bn

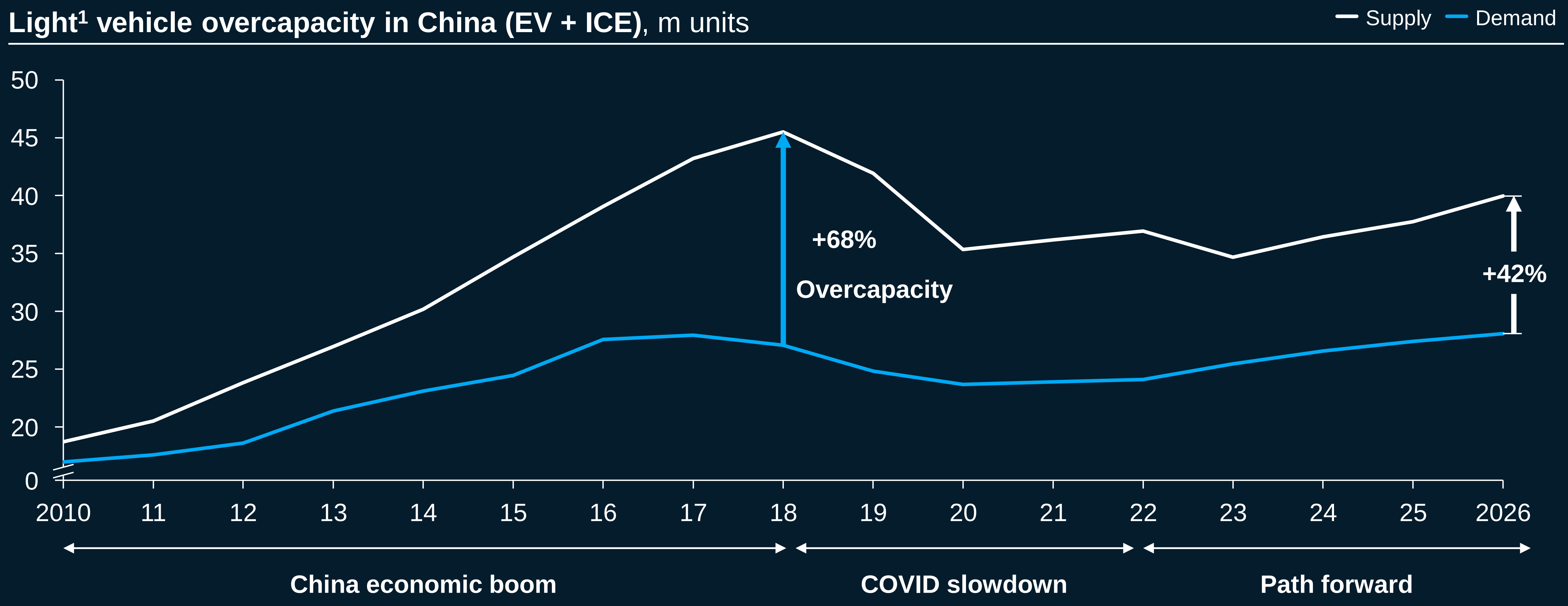
**~615** vs. **~250**
Greater China — Europe

**Fast charging network**
As of end of 2022, in k units

**~760** vs. **~70**
Greater China — Europe

# Overcapacity and a slowing economy in China has pushed COEMs to seek growth opportunities overseas

**Light[1] vehicle overcapacity in China (EV + ICE)**, m units




1. Including passenger vehicle and light commercial vehicles (including pick-ups), which is a smaller portion of the total capacity

Source: IHS; World bank, China Center research, Team analysis

# Masterplan for the European automotive industry

1. **Revive strengths around customer understanding, product design & brand**
2. **Relentlessly focus on cost and speed**
3. **Execute winning strategy for China**
4. **Create resilient, circular, and sustainable supply chains**
5. **Establish European battery and semicon champions**
6. **Forge an ADAS industry alliance**
7. **Close the SW skill gap to master the automotive digital transition**
8. **Accelerate investments in infrastructure**

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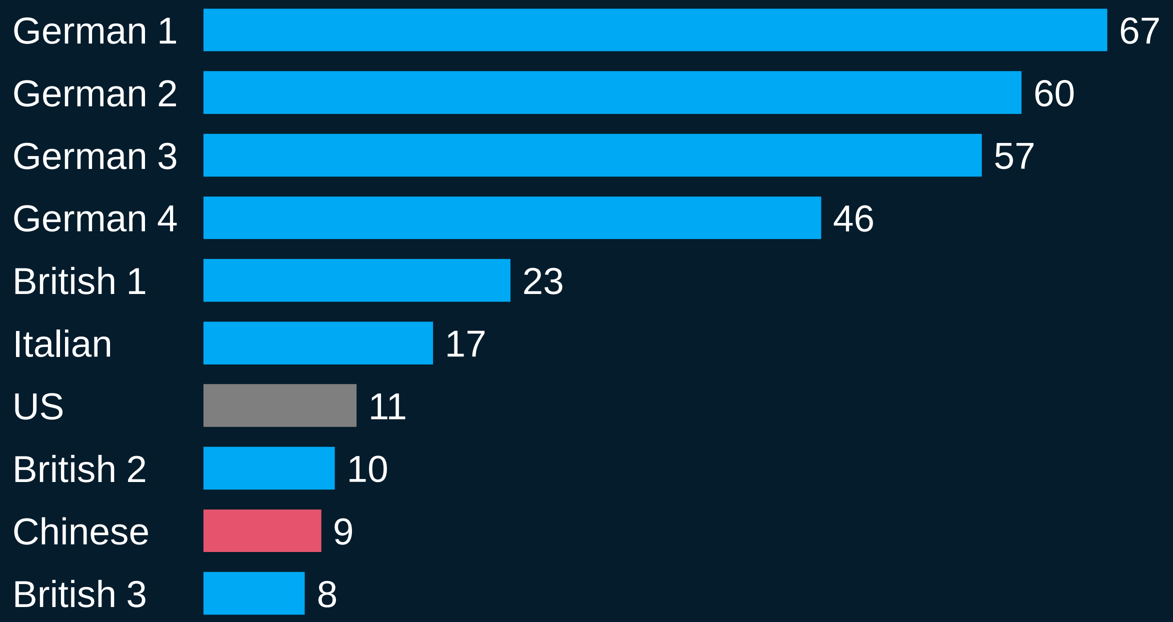
# 1. Revive strengths around customer understanding, product design & brand

Europe US China

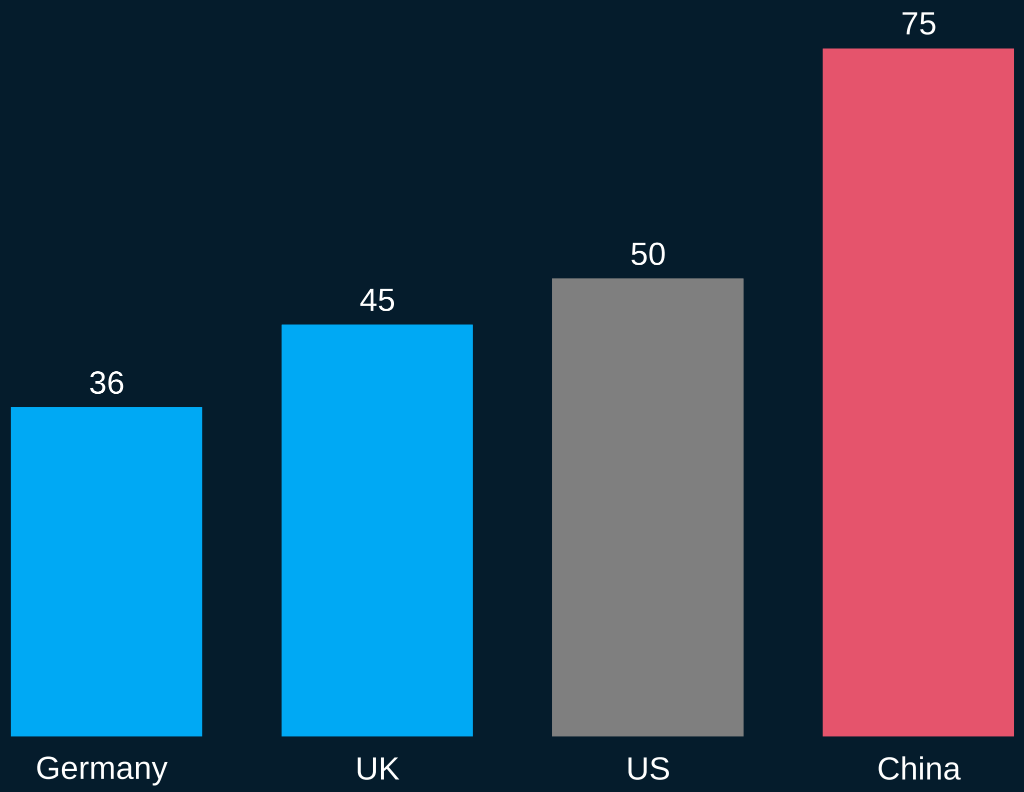
## Chinese consumers' brand perception on premium brands

Top 10 brands viewed as “premium brand" among consumers, % of respondents




## There are signs of weaking brand loyalty among automotive consumers

Likelihood of switching to a new brand when moving to an electric vehicle, %



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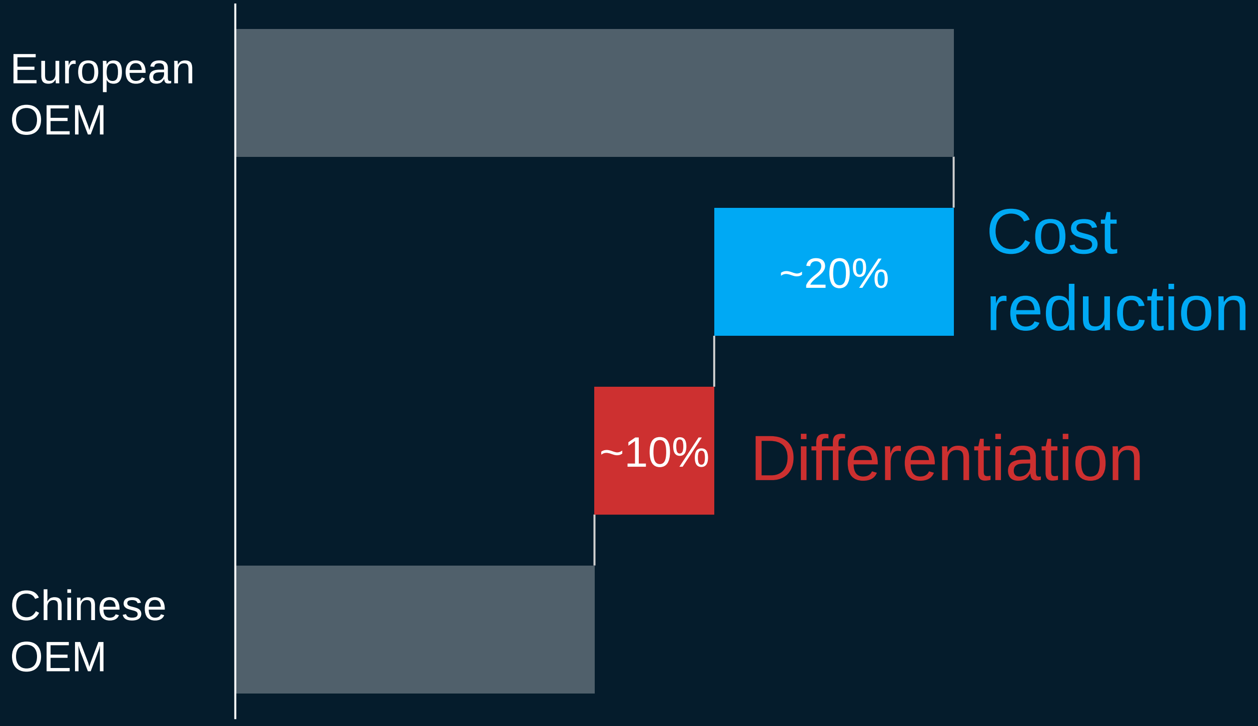
# 2. Relentlessly focus on cost (and speed)

**Total vehicle cost comparison between Chinese EV OEM and EU incumbents**
Example C-segment volume BEV




Evaluate alternatives in battery cell chemistry

Develop cost advantageous structural design

Leverage end-to-end supply chain scale

Define differentiating factors (e.g., design)

Accept location specific costs (e.g., labor, energy)

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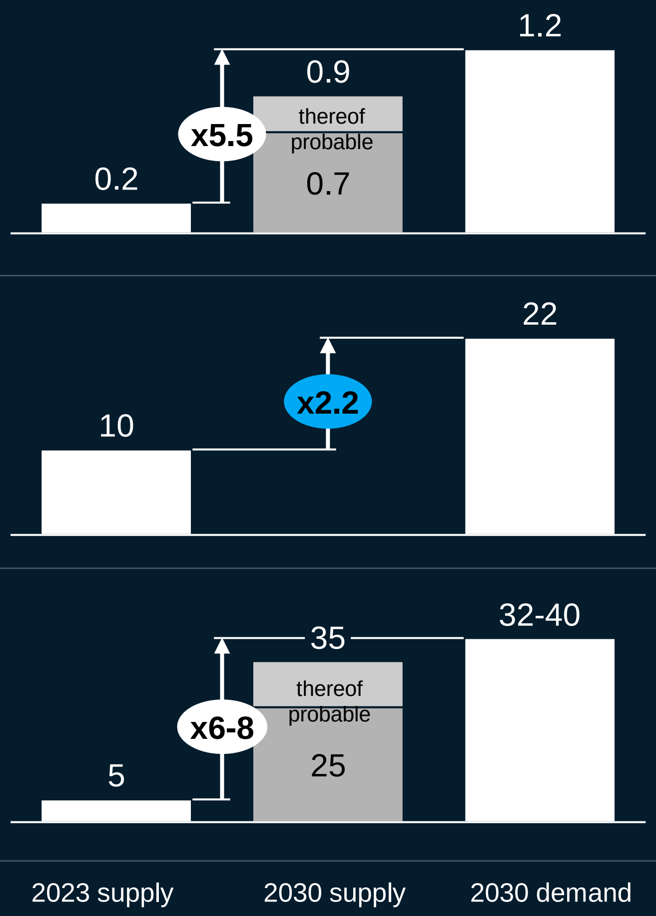
# 4. Create resilient, circular, and sustainable supply chains

European demand vs. supply




| | | |
|---|---|---|
| **Battery**<br>Li-on batteries, TWh | **35** investment, EUR bn | **20** battery gigafactories |
| **Semiconductor**<br>Front-end semicon, mwpy | **190** investment, EUR bn | **37** semicon fabrication plants |
| **Green material**<br>Low $CO_2$ flat steel, Mt | **38** investment, EUR bn | **15** green DRI (direct reduced iron) installations |

## Europe has launched first actions to find its way out of the semicon crisis

**11/37 (30%)** semicon fabrication plants already announced, planned or in construction (within last 2 years)

**European Chips Act** with EUR 43 bn in subsidies launched in 2023 (to be further increased)

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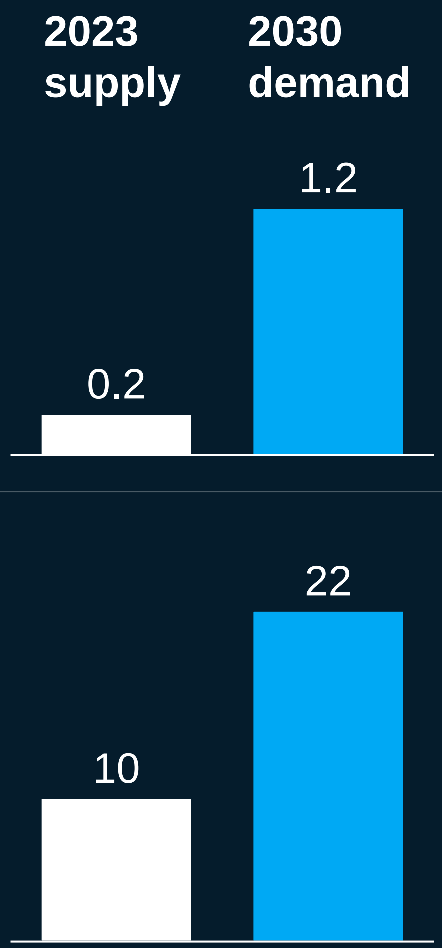
# 5. Establish European battery and semicon champions




**Battery**
Li-on batteries, TWh

**€ 127bn**
Level of total public and private investment across the EU battery value-chain by 2021

**>20**
Gigafactory cell production battery projects announced in Europe

**Semiconductor**
Front-end semicon, mwpy

**11/37**
semicon fabs already announced, planned or in construction (within last 2 years)

**€ 43bn**
Level of subsidies resulting from the European Chips Act in 2023 (to be further increased)

# Masterplan for the European automotive industry

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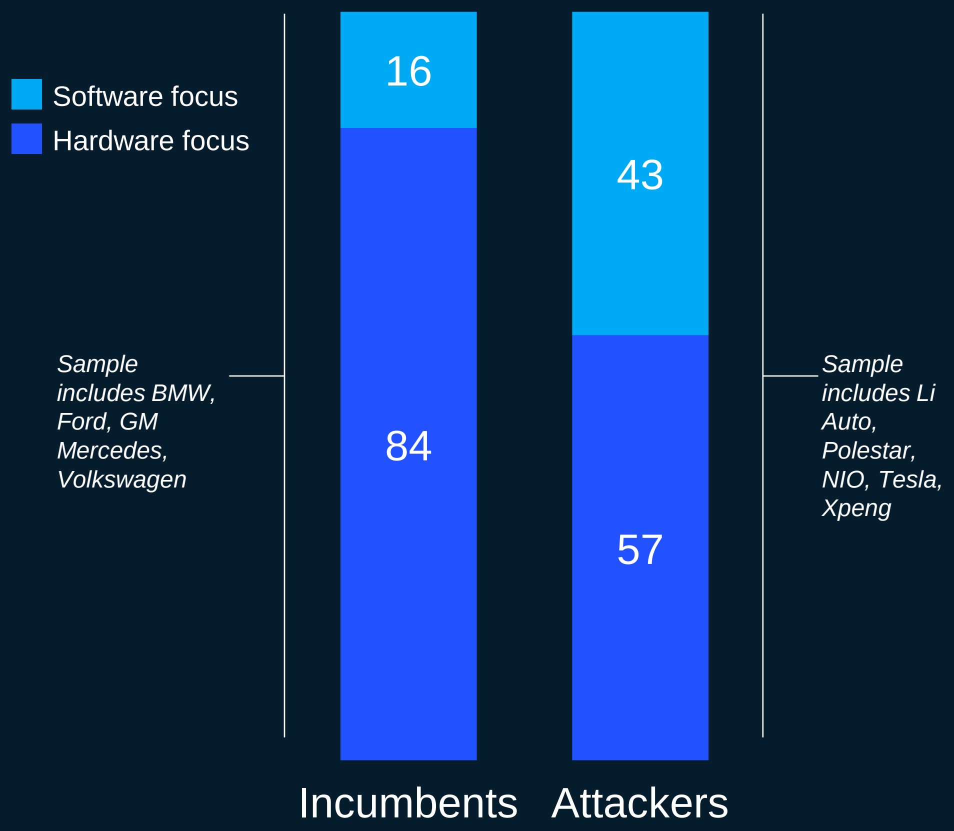
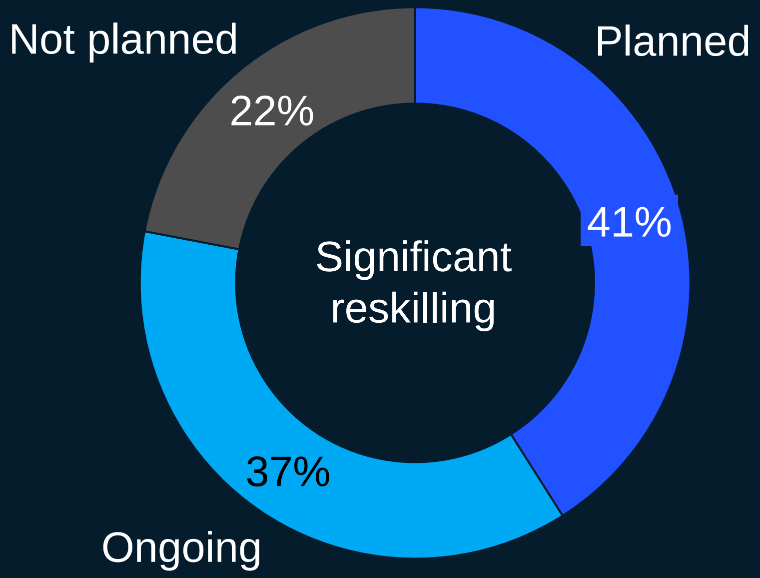
# 7. Close the SW skill gap to master the automotive digital transition

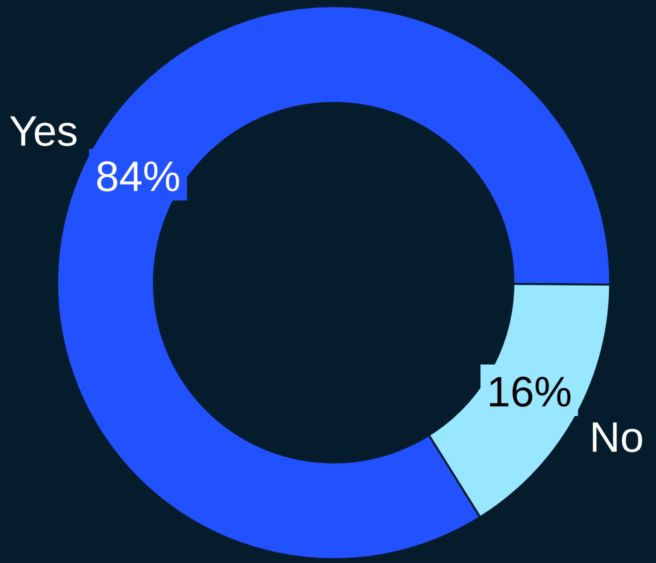
**Share of hardware/software focused R&D talent per OEM,** percent




**Reskilling efforts by suppliers in full swing**




**Open European software-defined vehicle platform needed?**

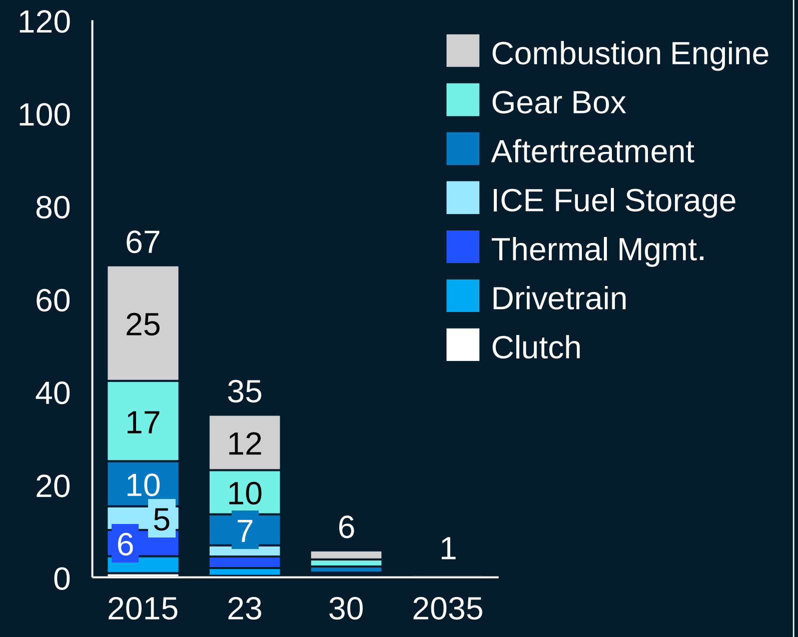



*Survey among 19 European OEMs and suppliers*

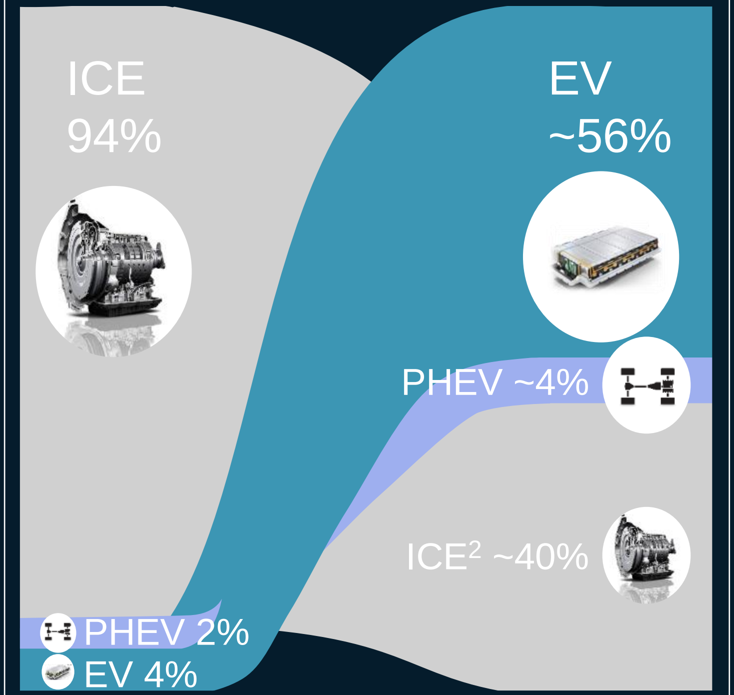
# BEV transition shifts powertrain component market from mechanical to chemical and electrical value creation

**Europe**

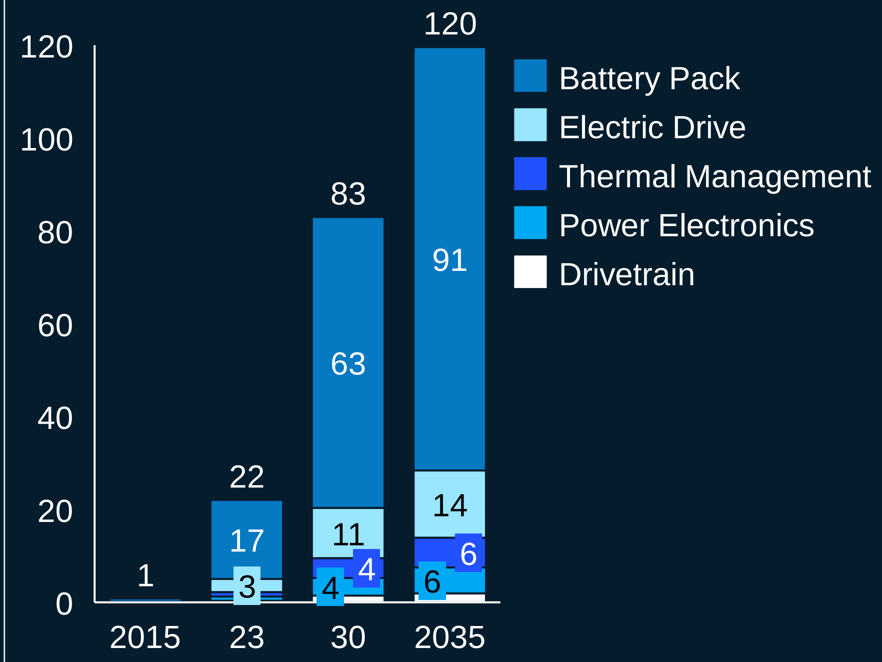
**ICE[1] Powertrain component revenue,**
bn USD




**Global market 2020** | **Global market 2030**




**EV[2] Powertrain component revenue,**
bn USD




1. ICE only, not including HEV, MHEV
2. BEV only, not including FCEV, PHEV

Source: McKinsey Center for Future Mobility

# We start the catch-up out of a position of strength

**Regional GDP**
USD trillion, 2023

19.0 vs. 26.3
China Europe

**Global top 10 OEM**
brand value, 2023

0/10 vs. 5/10
China Europe

**OEM Revenues**
Top 5, EUR bn, 2022

~240 vs. ~870
China Europe

**Supplier Revenues**
EUR bn, 2022

~50 vs. ~205
Greater China Europe

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