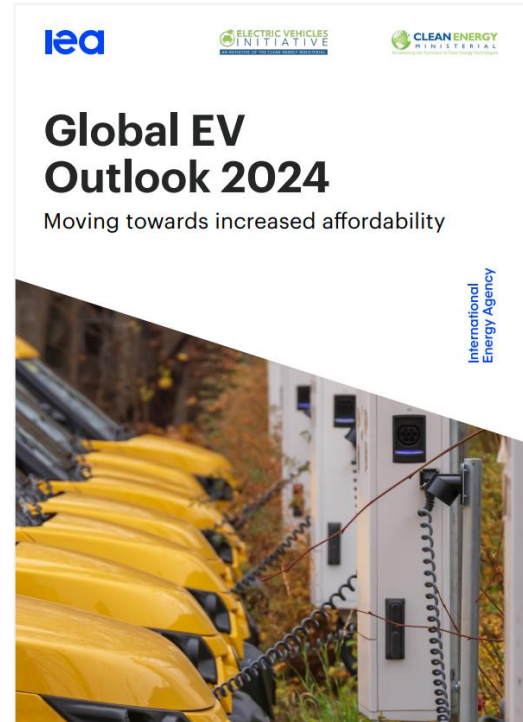
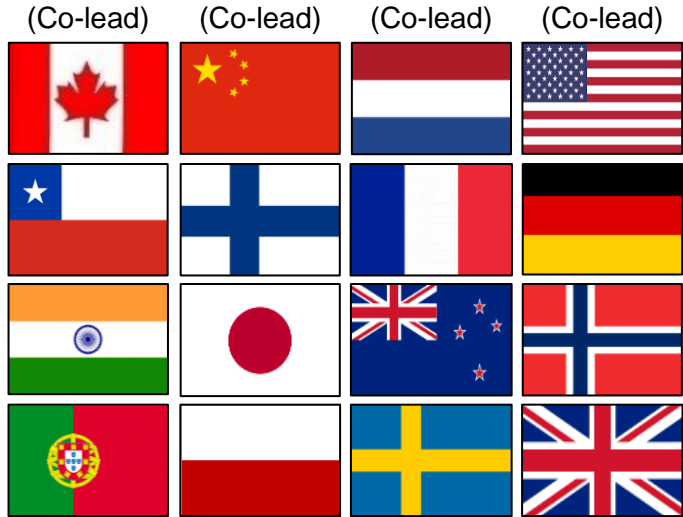




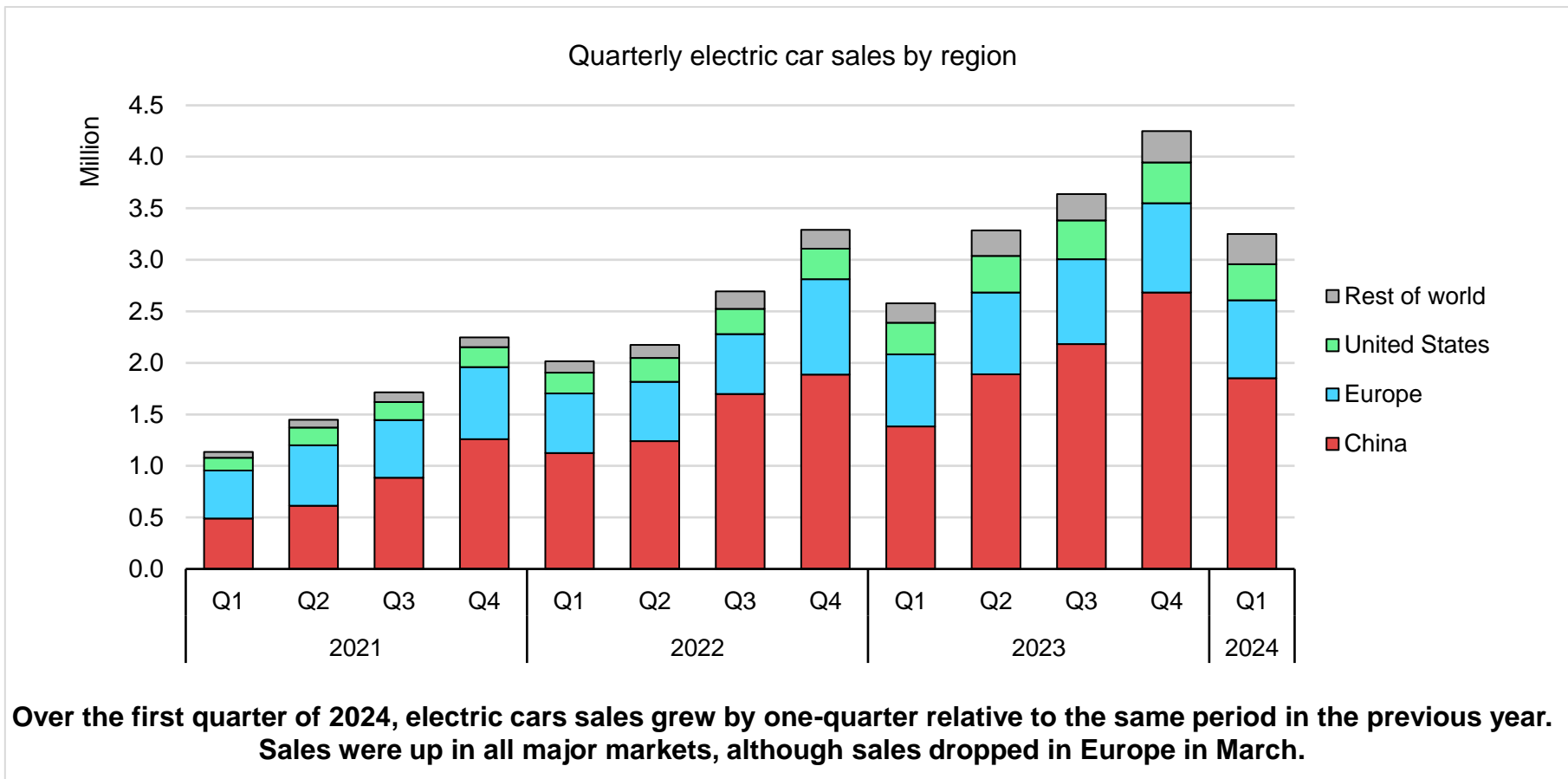
Global EV Outlook 2024

Technical Webinar, 26 April

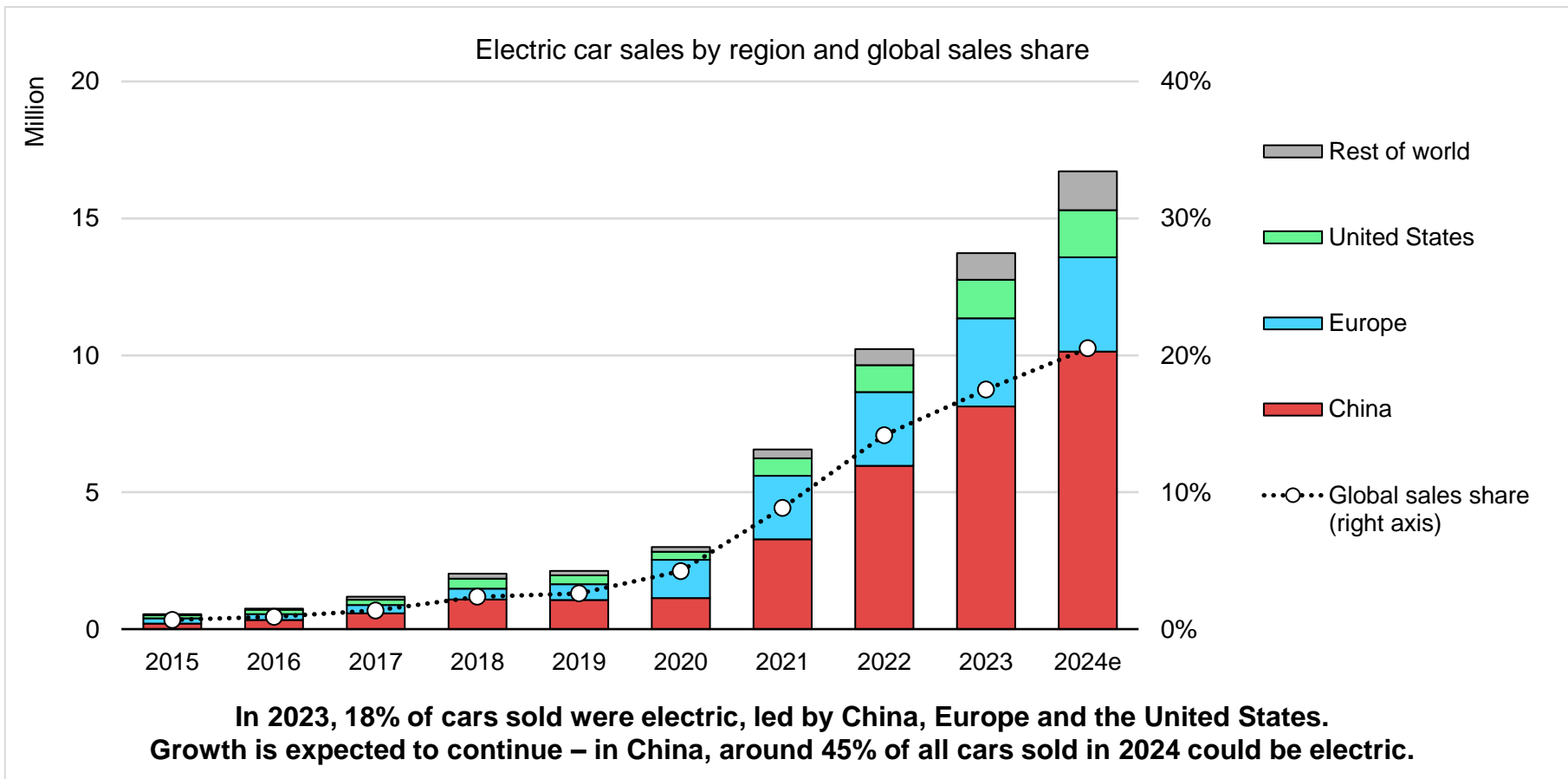


Electric car sales

The story of electric car growth continues

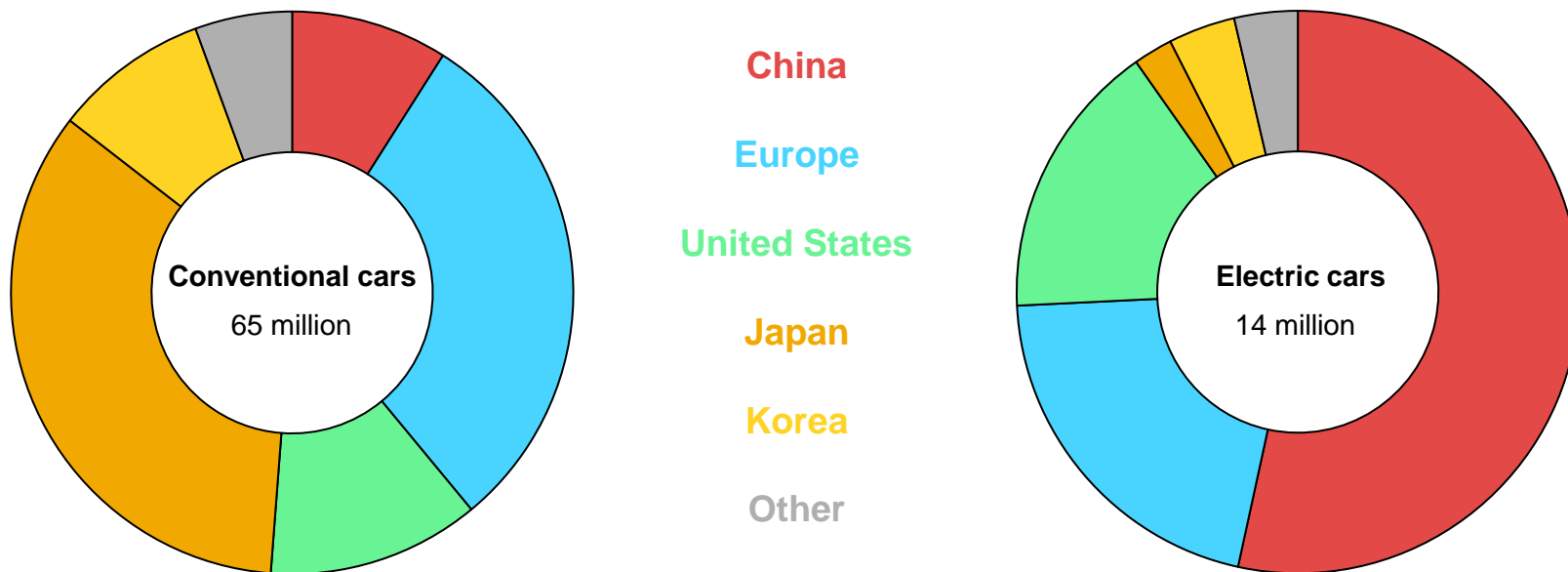


2024 is set to be another record year for electric car sales



A new electric car industry is emerging

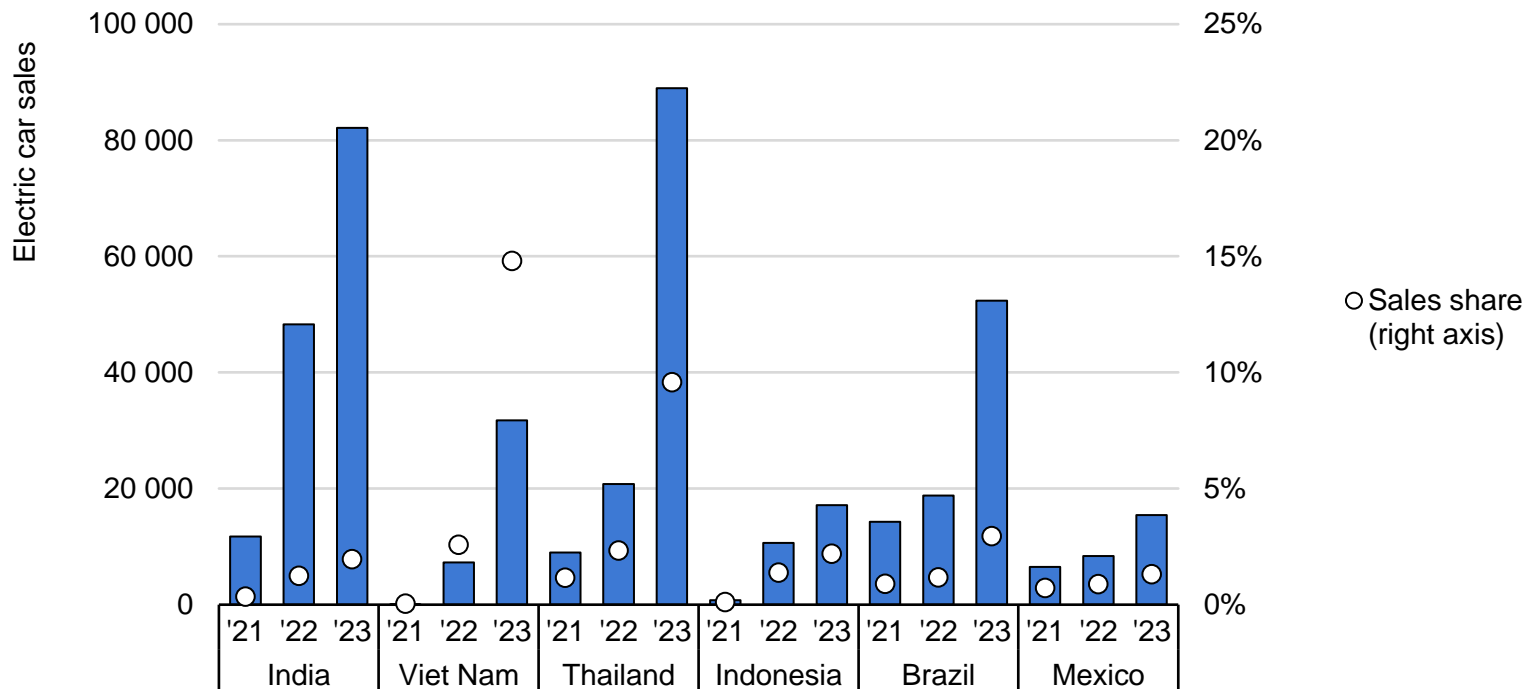
Share of global car markets by automaker headquarters, 2023



Chinese companies provide more than half of global electric car sales, compared with just 10% for conventional cars.

Sales in emerging markets and developing economies are growing

Electric car sales by carmaker headquarters and country, 2021-2023

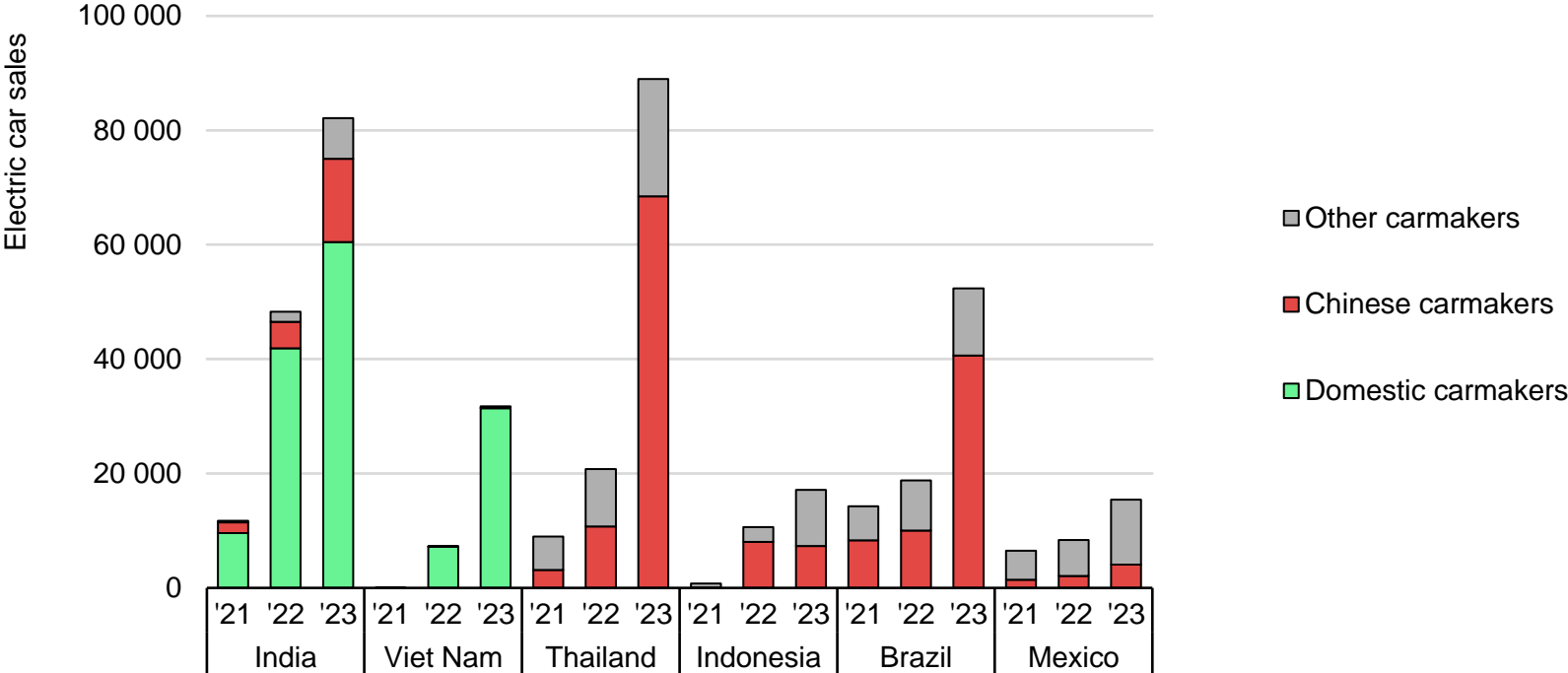


Electric car sales are growing quickly across major EMDEs, supported by policy. Local champions are emerging in India and Viet Nam, while Chinese carmakers expand elsewhere.

Sales in emerging markets and developing economies are growing

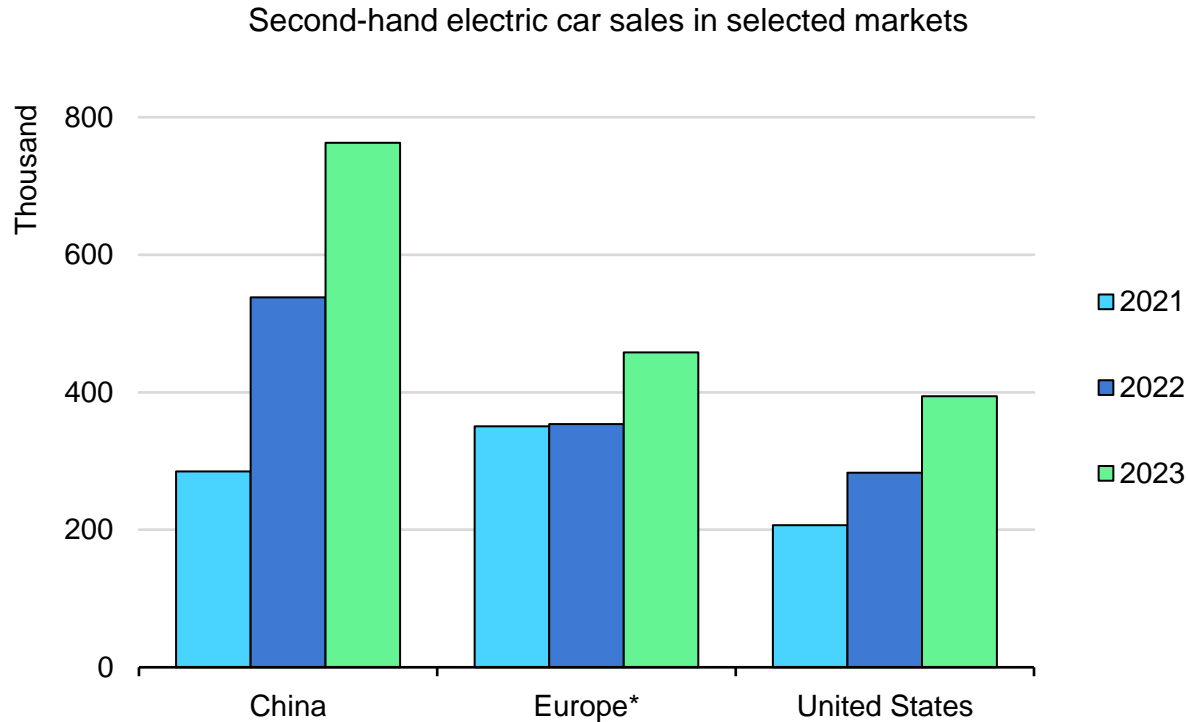


Electric car sales by carmaker headquarters and country, 2021-2023



Electric car sales are growing quickly across major EMDEs, supported by policy. Local champions are emerging in India and Viet Nam, while Chinese carmakers expand elsewhere.

Second-hand electric car markets are growing

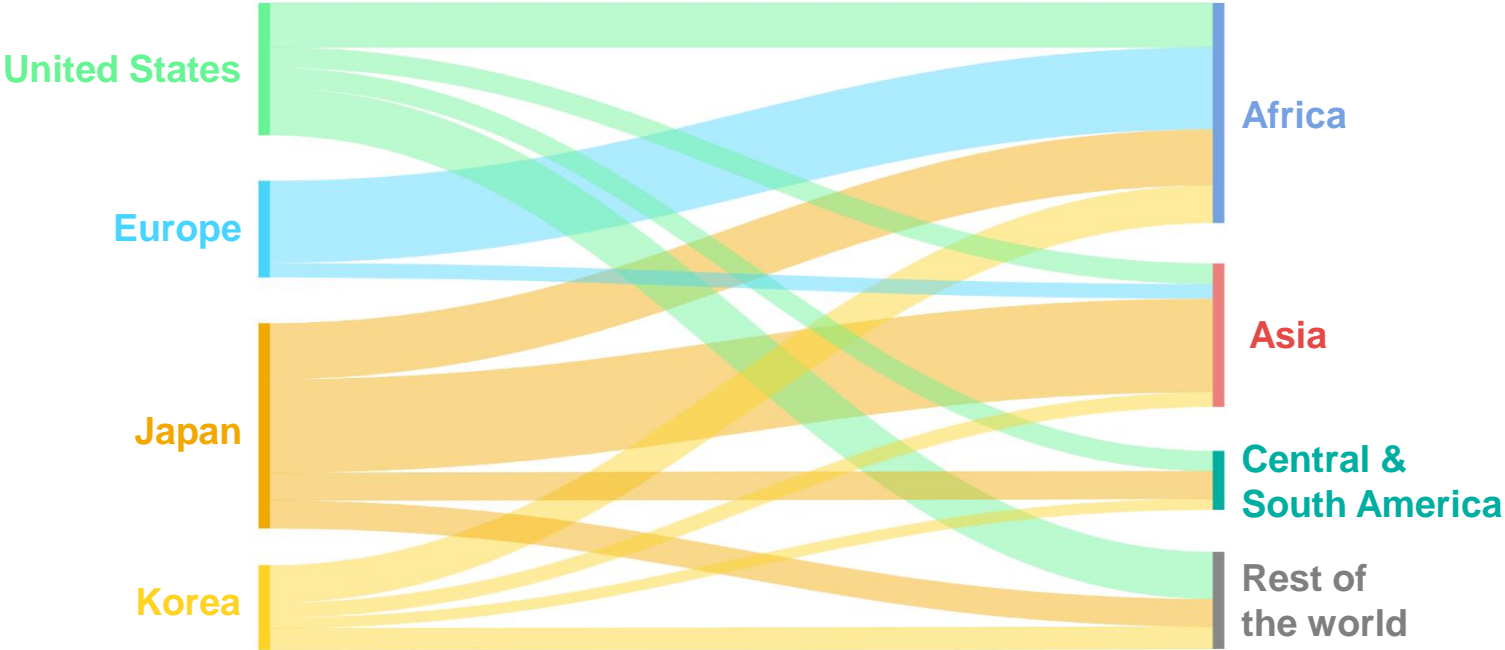


On aggregate, global second-hand electric car sales in the major EV markets were roughly equal to new electric car sales in the United States in 2023.

Used vehicle flows may have important implications for EV adoption



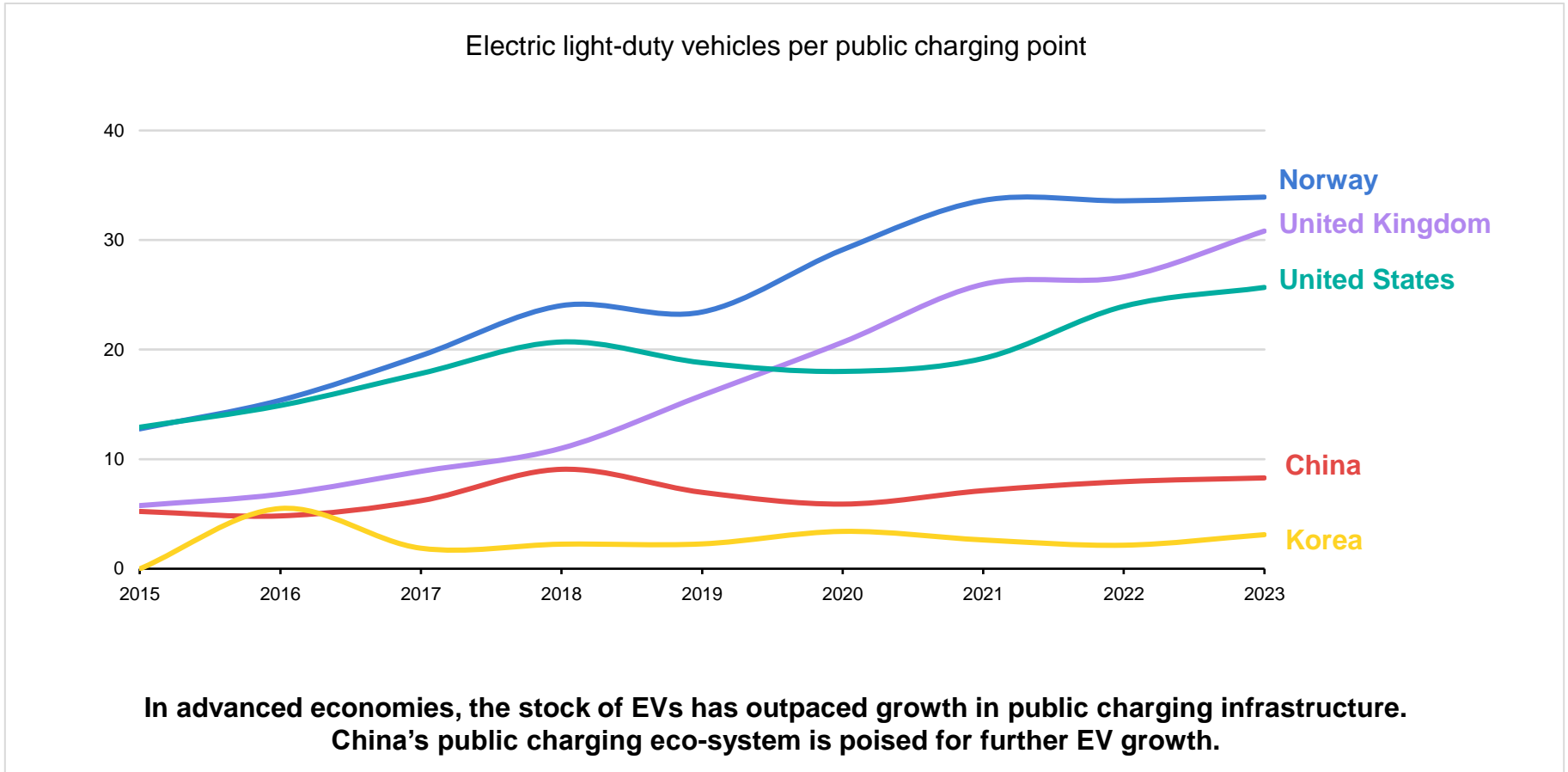
Common trade flows for conventional used exports between advanced and emerging economies, 2020



African countries represent around 40% of used vehicle imports according to the United Nations Environment Programme.

Charging

Roll-out of public charging is critical to enable mass EV adoption

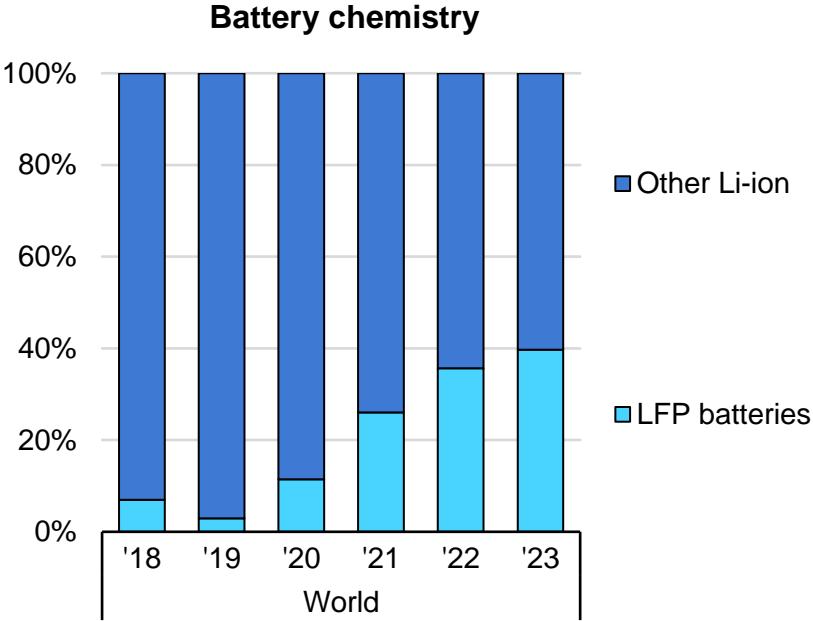
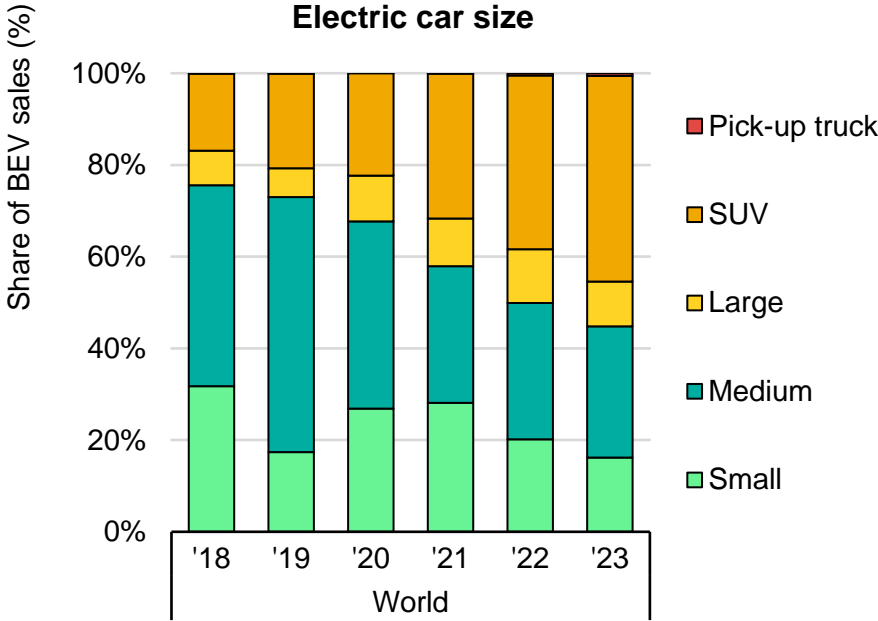


Affordability

Electric cars are getting larger; battery chemistries are diversifying



Share of battery electric car sales

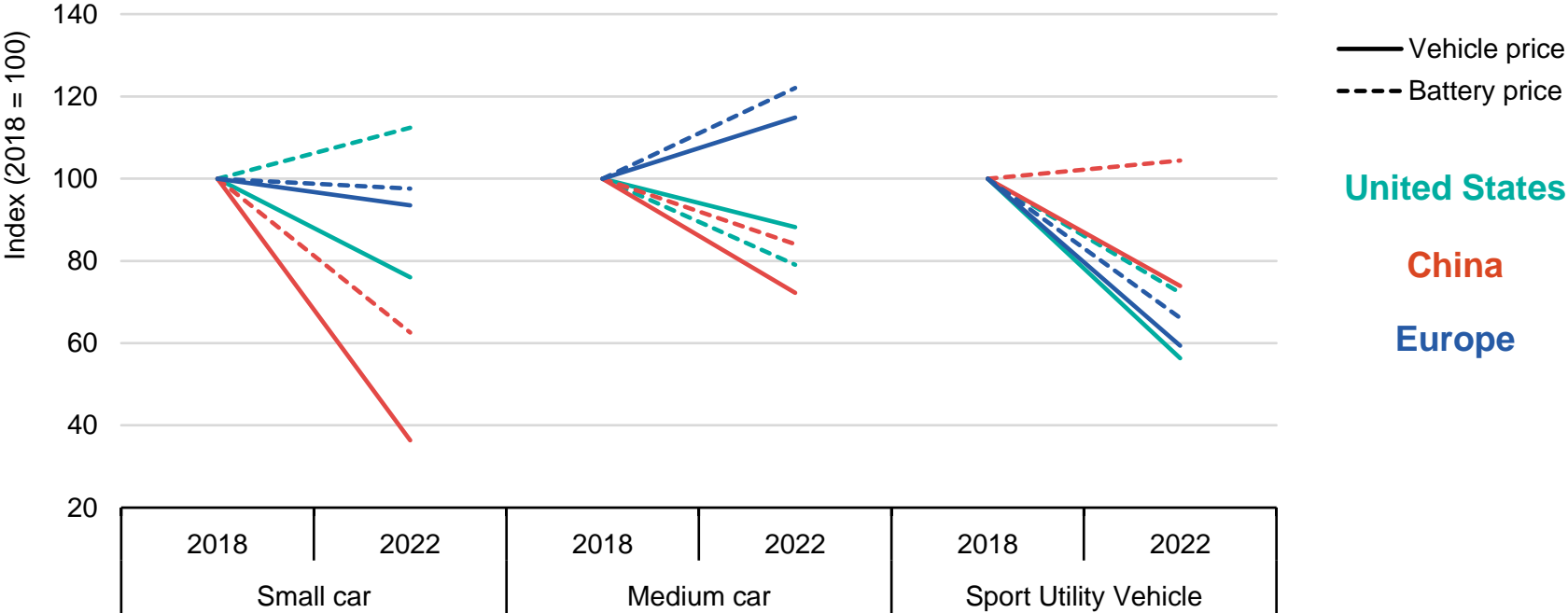


In 2023, **SUVs and large** models accounted for **55%** of global electric car sales.
In China, the share of **LFP batteries** in electric car sales reached **60%**.

Falling battery prices and market competition improve affordability



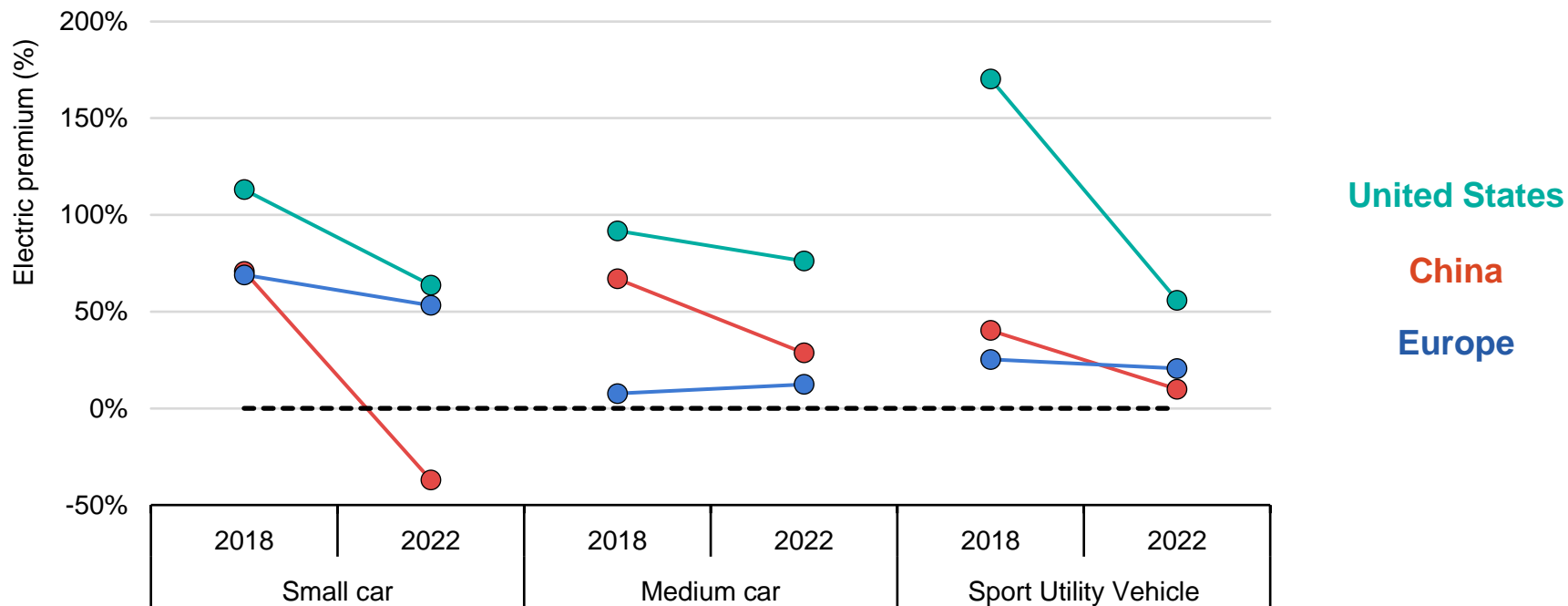
Electric car and battery prices, sales-weighted by car size and region, 2018-2022 [adjusted for inflation]



Electric car affordability is influenced by **battery size and price**, and the intensity of **market competition**.
In China, the average SUV price fell 25% despite increasing battery size and price.

Price parity of EVs is getting closer

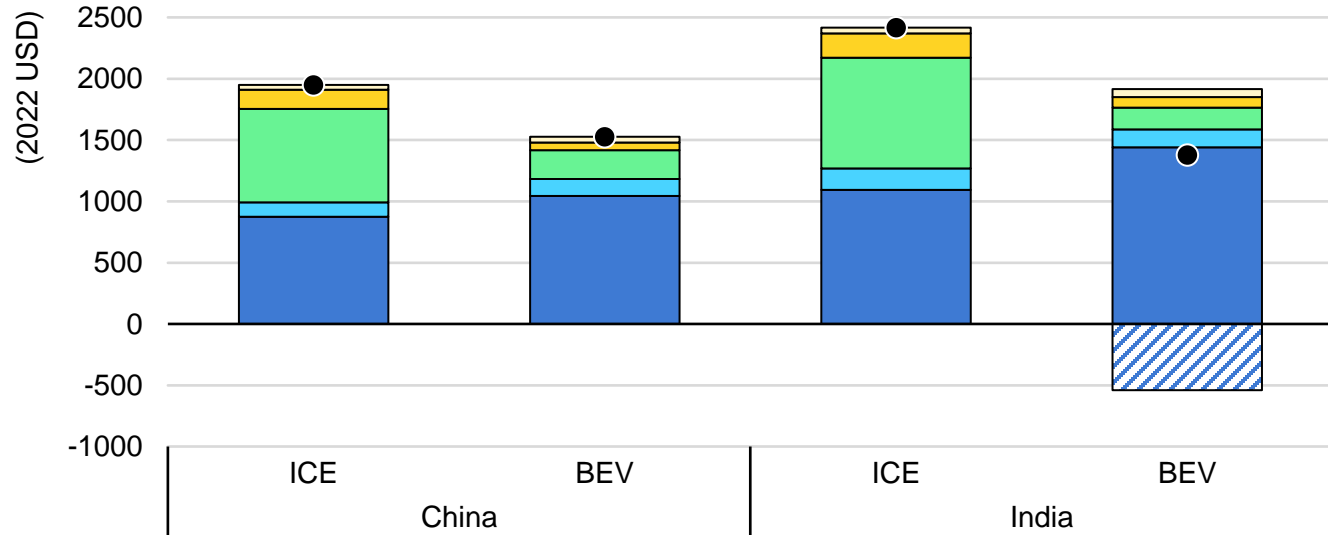
Price premium for electric cars by segment and region, 2018 and 2022 [adjusted for inflation]



Last year in China more than **60%** of the EVs sold were **cheaper than their average ICE equivalent**.
Outside of China, electric cars remain **more expensive than ICE** in most cases.

In Asia, electric 2Ws are cheaper to own than ICE models

5-year total cost of ownership (TCO) breakdown of market average 2Ws across Asia, in 2023



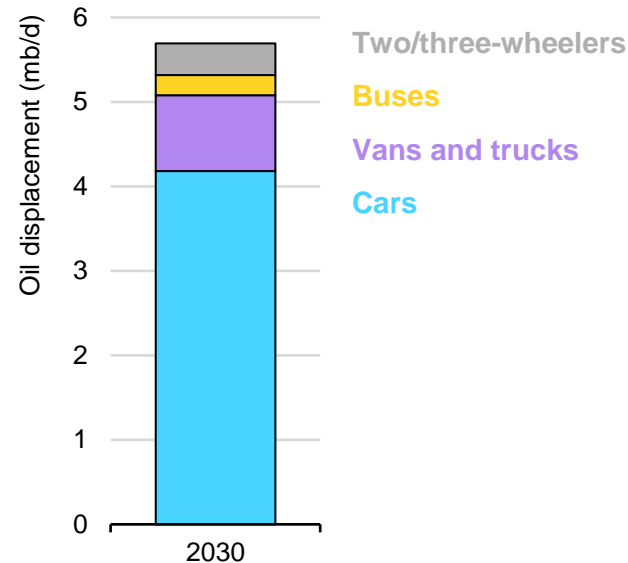
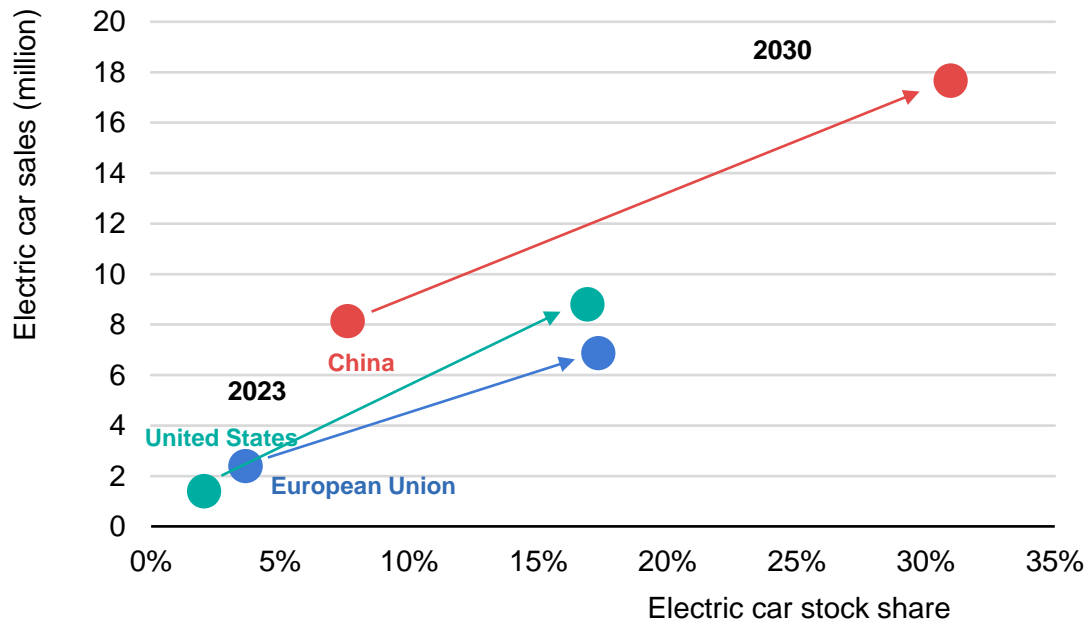
■ Retail price
 ■ Financing
 ■ Fuel
 ■ Maintenance
 ■ Insurance
 ■ Incentives (EMPS + GST / RTO rebates)
 ● TCO Net

Even without subsidies the TCO of electric 2Ws is lower than that of their gasoline-fueled counterparts.

Outlook

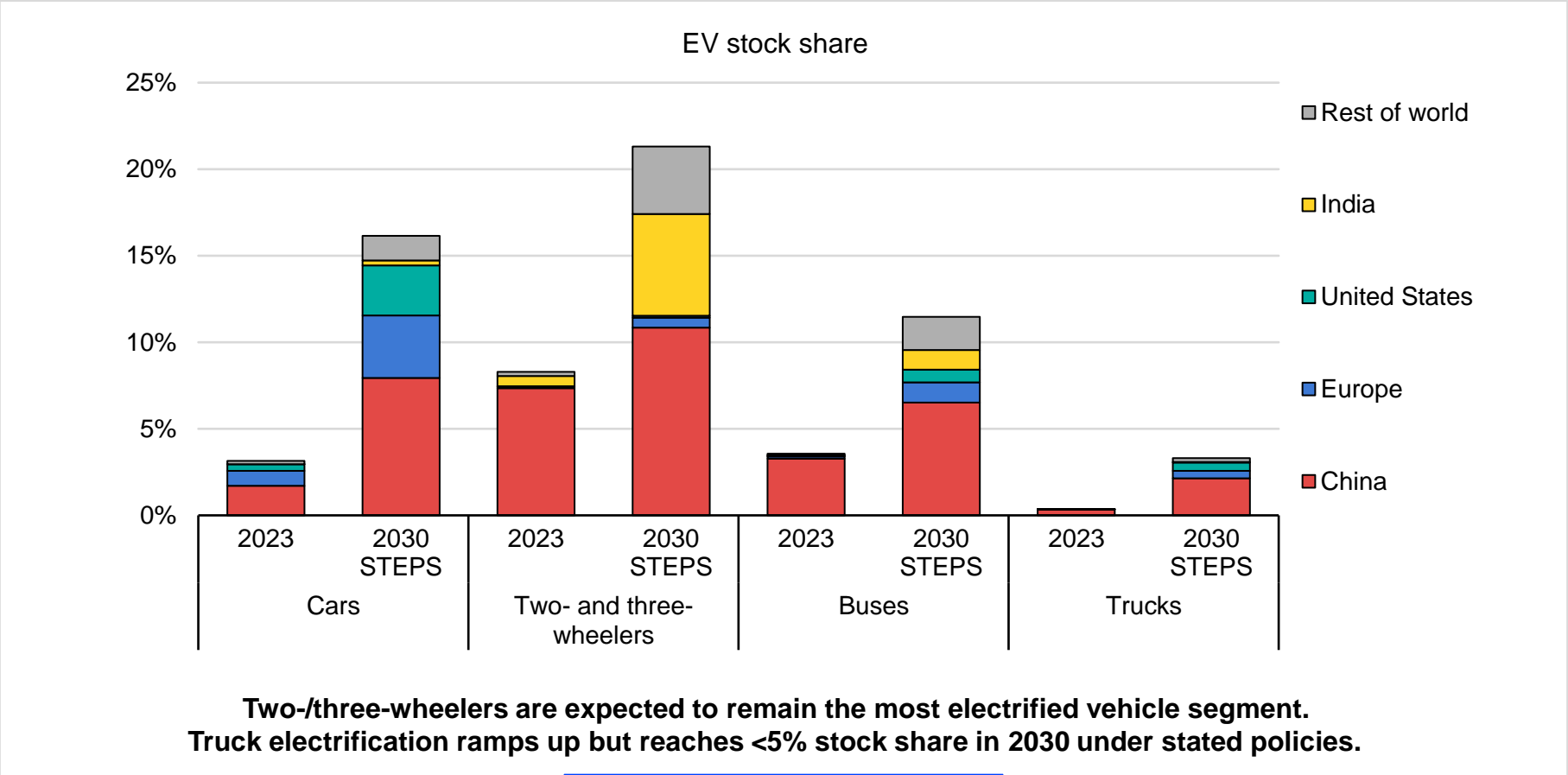
The electric car fleet is set to grow quickly

Electric car sales, stock share and oil displacement in the Stated Policies Scenario, 2023-2030



By 2030, under current policy settings, electric cars represent more than 30% of the China's car fleet and around one-fifth of the car stock in the European Union and United States.

Electrification goes beyond cars

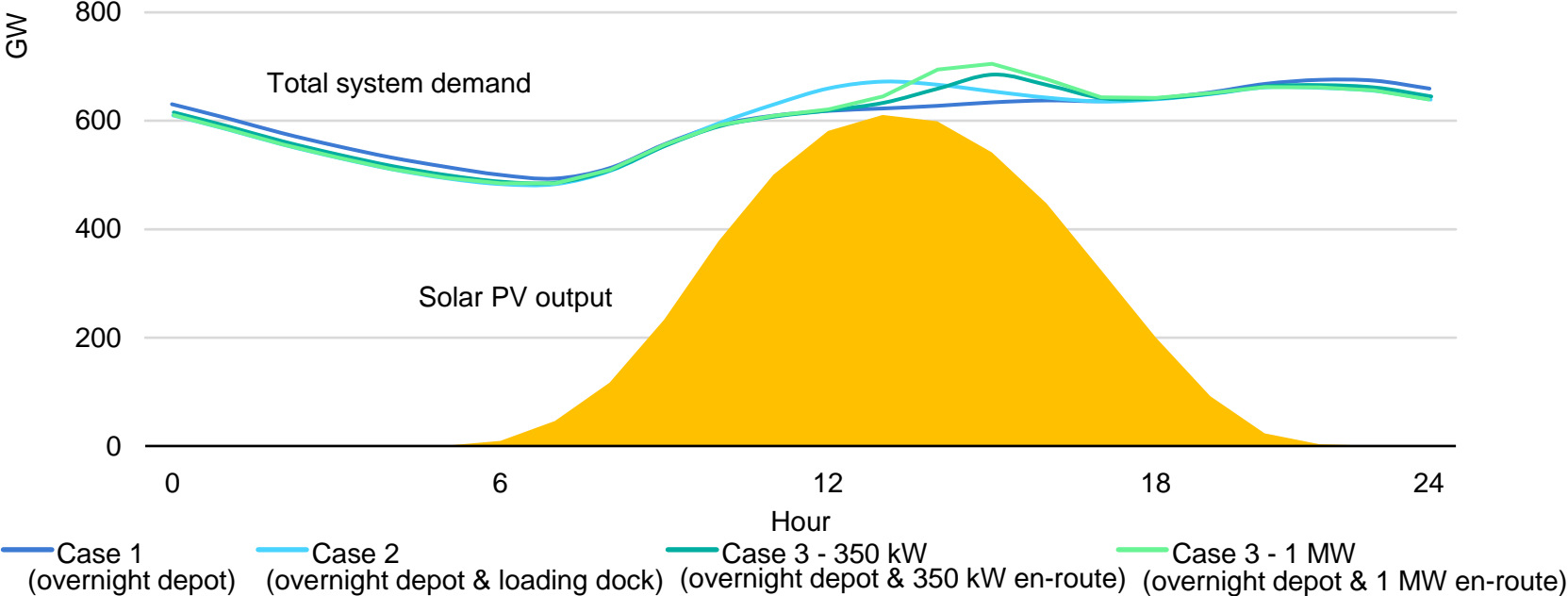


Grid integration

Daytime charging of HDVs can support solar PV integration



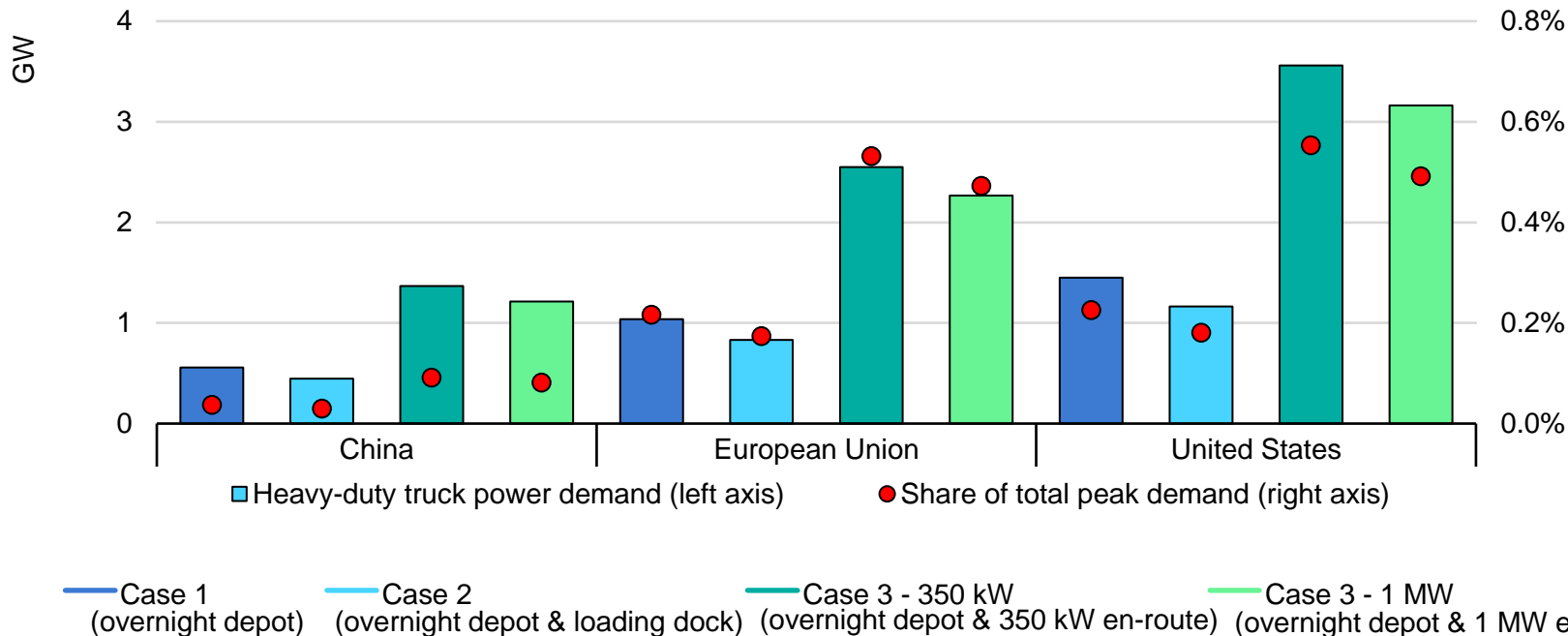
Impact of different electric truck charging cases on daily power demand in the United States in the Announced Pledges Scenario, 2035



Up to almost 50% of the daily charging needs of heavy-duty trucks are met during daylight hours in the cases that include fast daytime charging.

HDVs would not contribute significantly to evening peak demand

Average electric truck power demand between 5 and 8 PM by region and case in the Announced Pledges Scenario, 2035

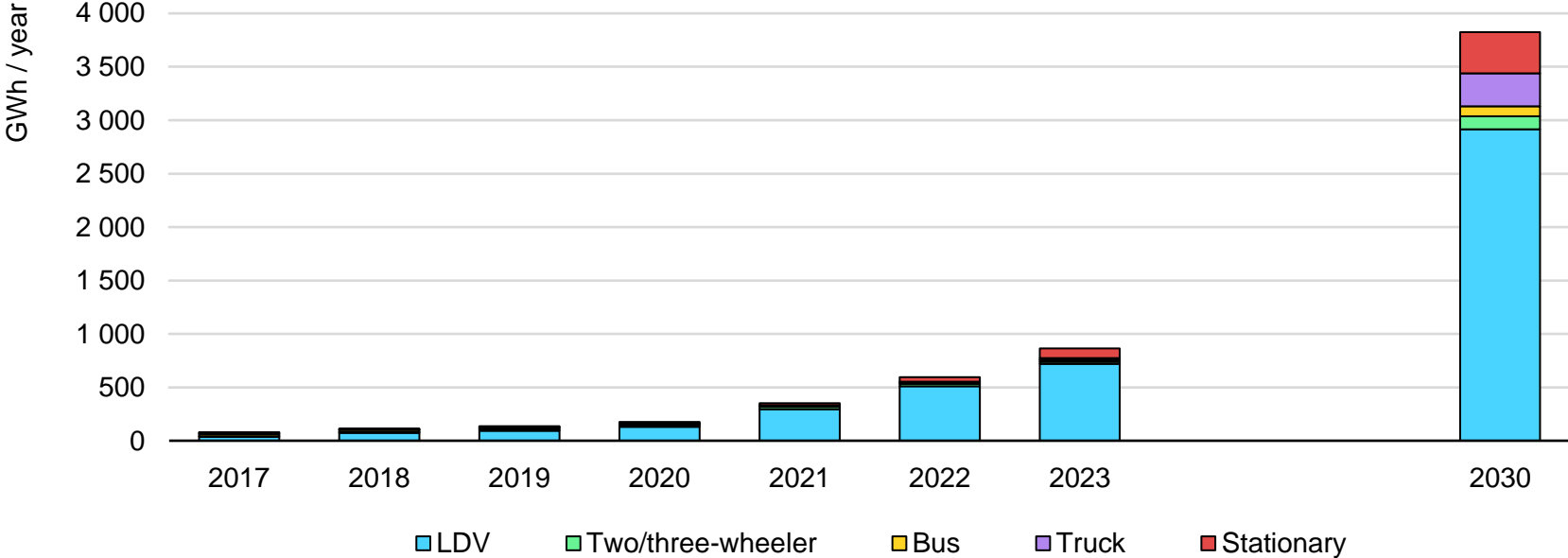


Heavy-duty trucks account for under 0.6% of peak evening power demand by 2035 in the APS in these regions. Smart charging, anticipatory planning, batteries, and other measures will be key to manage local challenges.

Batteries

Battery demand for EVs is set to grow four-and-a-half to 2030

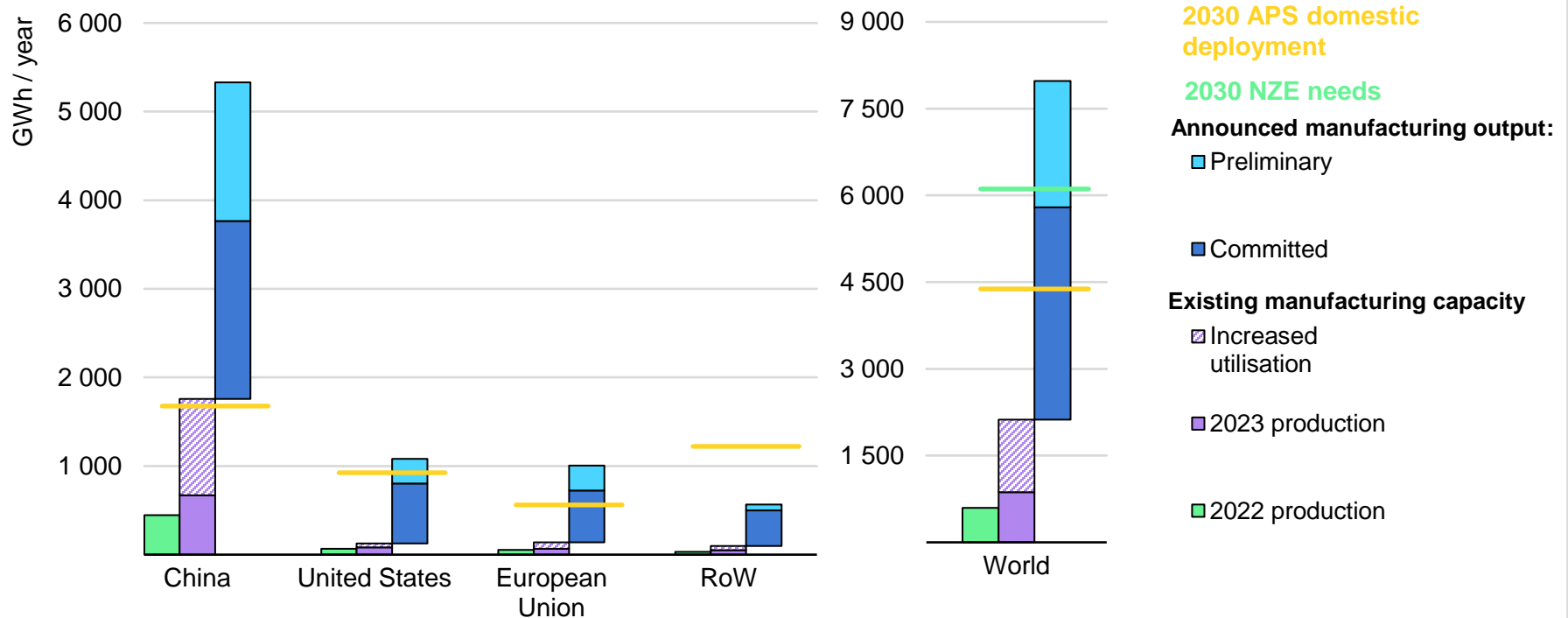
Battery demand by application and region in the Stated Policy Scenario, 2017-2030



Electric cars are set to remain the main source of demand, but demand for e-trucks and stationary storage grows rapidly.

Announced battery manufacturing capacity sufficient for net zero

Announced expansion of battery manufacturing maximum output by region in the APS and NZE Scenarios, 2023 and 2030

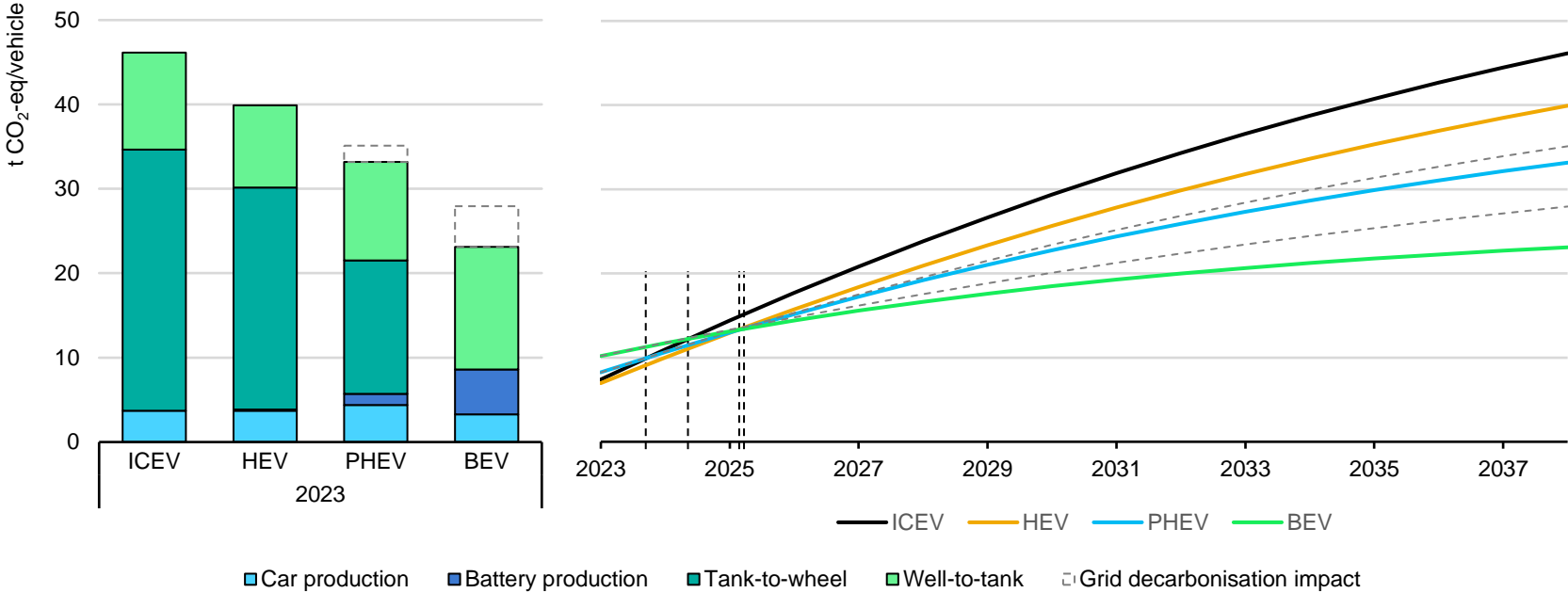


In the major EV markets, battery manufacturing announcements, if realised fully, would be sufficient to meet government ambitions in 2030 with domestic production.

Lifecycle analysis

EVs already significantly outperform ICEs in terms of emissions

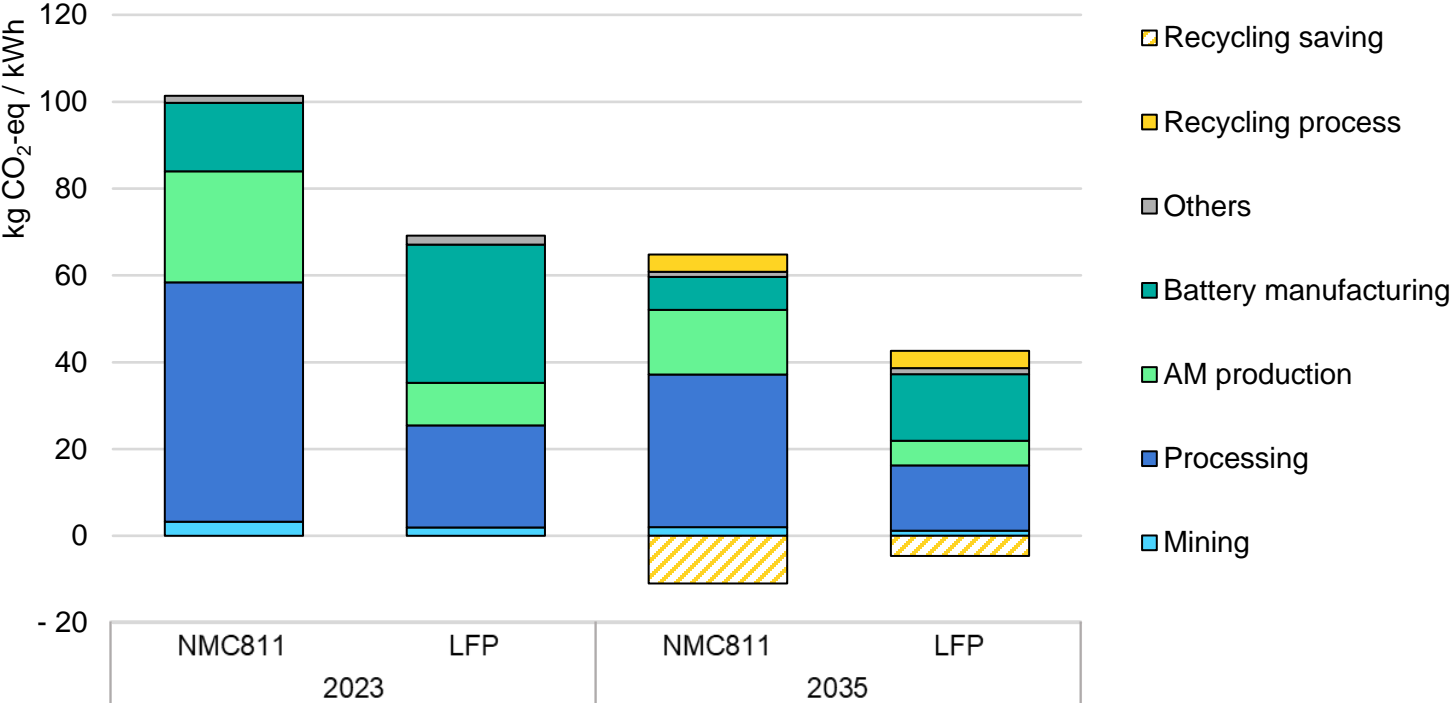
Global average medium-car lifecycle emissions by powertrain in STEPS, 2023



EVs can pay back the additional emissions associated with battery production in around 2 years, while grid decarbonisation over the vehicle lifetime boosts emissions savings by over 25%

Battery chemistry impacts lifecycle emissions

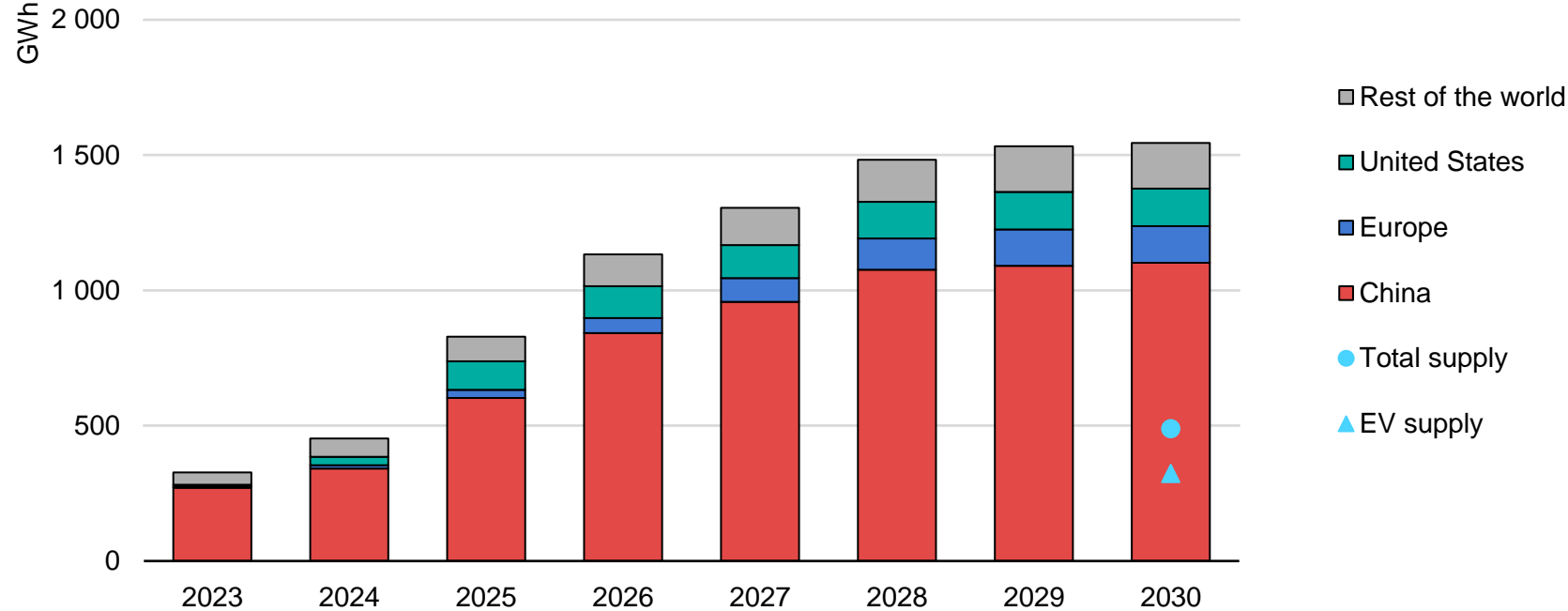
Battery pack lifecycle emissions by chemistry in the Announced Pledges Scenario, 2023-2035



LFP battery lifecycle emissions are about one-third lower than those for NMC811. The decarbonization of different chemistries require focusing on different parts of the supply chain.

Battery recycling capacity set to increase 3-fold by 2030

Expected battery recycling capacity by region based on current announcements and potential supply in APS, 2023-2030



Recycling capacity diversifies from today to 2030, with Chinese share decreasing from over 80% to 70%. Recycling capacity could be 3 times higher than supply in 2030, but retired EV batteries grow rapidly in the 2030s.

Recommendations

1

Maintain and adapt support for electric cars

2

Promote adoption in emerging and developing economies

3

Enable the heavy-duty market

4

Expand EV infrastructure and smart grids

5

Ensure secure, resilient and sustainable EV supply chains

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