



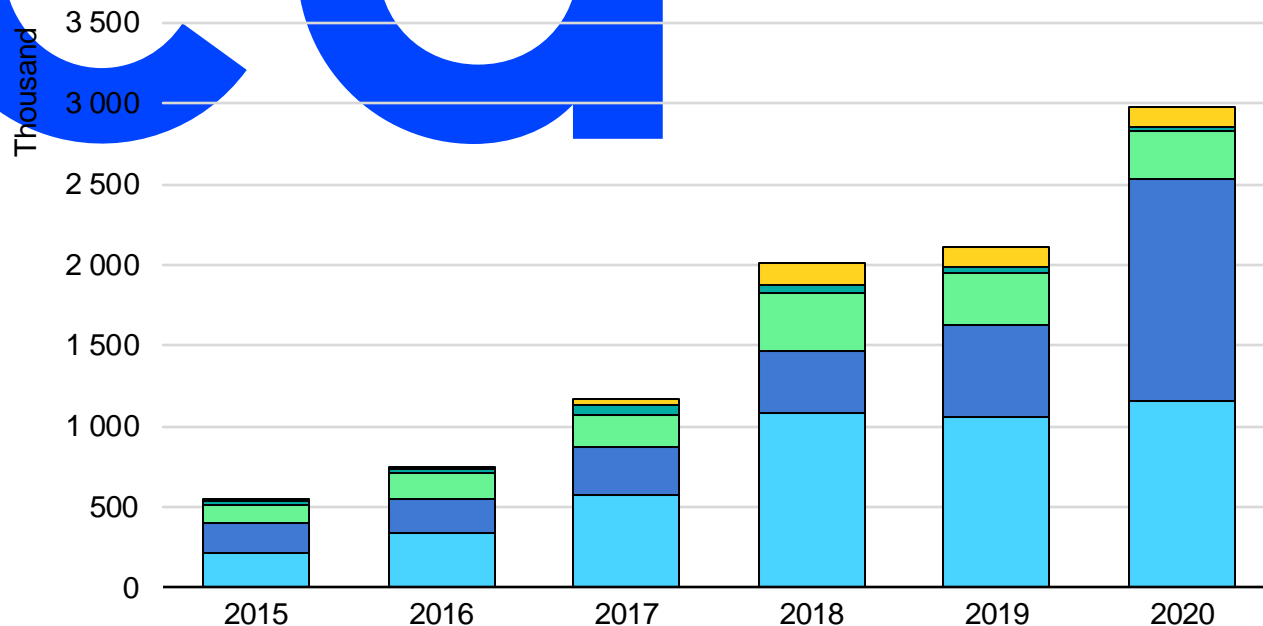
Global EV Outlook 2021

Jacopo Tattini

Edinburgh Napier University - 7th annual electric vehicle event - 13 October 2021

Electric car sales were resilient to the pandemic

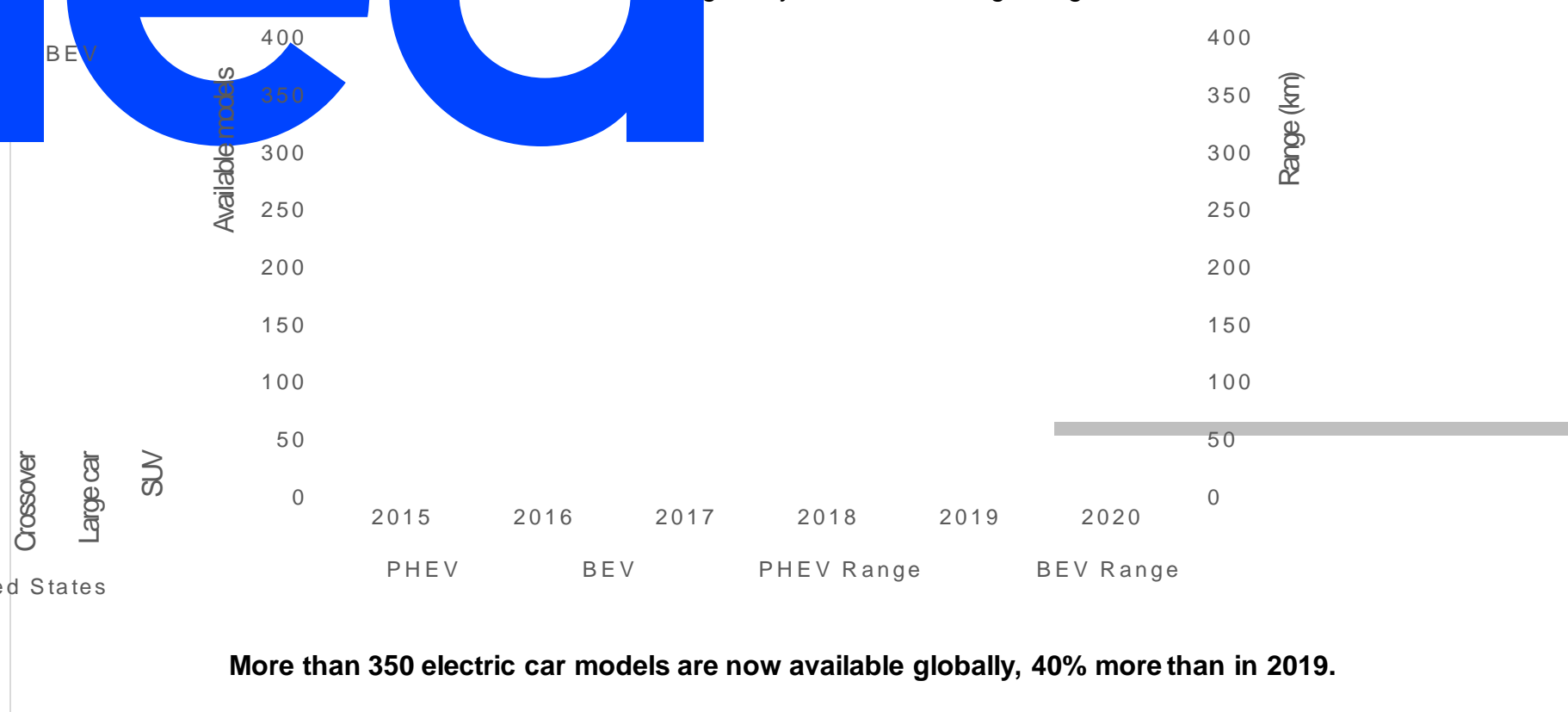
Annual electric car sales by region, 2015-2020



Global electric car sales rose by 41% in 2020 despite falling overall car sales. Europe became the largest electric car market for the first time, overtaking China.

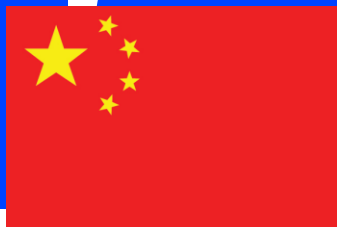
The number of electric car models available continues to grow

Electric car models available globally, and their average range, 2015-20



More than 350 electric car models are now available globally, 40% more than in 2019.

Strong policies underpin major electric car markets



Fuel consumption limits set at 4.0 L/100 km (NEDC) by 2025.

NEV credit mandate to 2023.

New Energy Automobile Industry Plan: 20% of sales = ZEVs by 2025.

Postponement of NEV subsidy phase out to 2022.



Tailpipe standards of 95 gCO₂/100km or 4.1 L/100 km (2021, petrol, NEDC).

Sustainable and Smart Mobility Strategy and Action Plan.

Various MS ICE car bans, and subsidy measures.

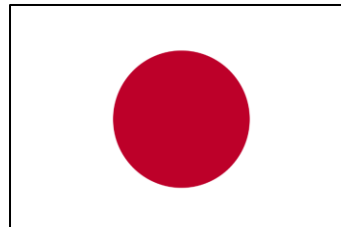
Additional purchase incentives as pandemic response in Germany, France, Italy.



Emissions standards are set at 134 gCO₂/km or 5.2 L/100 km (2022, NEDC).

City level initiatives e.g. New Delhi targets 25% electrification of vehicle sales in 2024.

FAME II allocates USD 1.4B over 3 years until 2022 for 1.6M hybrid and electric vehicles.



Emissions standards are set at 132 gCO₂/km or 5.7 L/100 km (2020, WLTP Japan).

100% electrified PLDV sales by mid-2030s.

Doubling of subsidies for ZEVs.

Tax exemptions on EVs have been extended for 2 years.



SAFE standard weakening fuel economy improvements from 4.7% per annum to 1.5%.

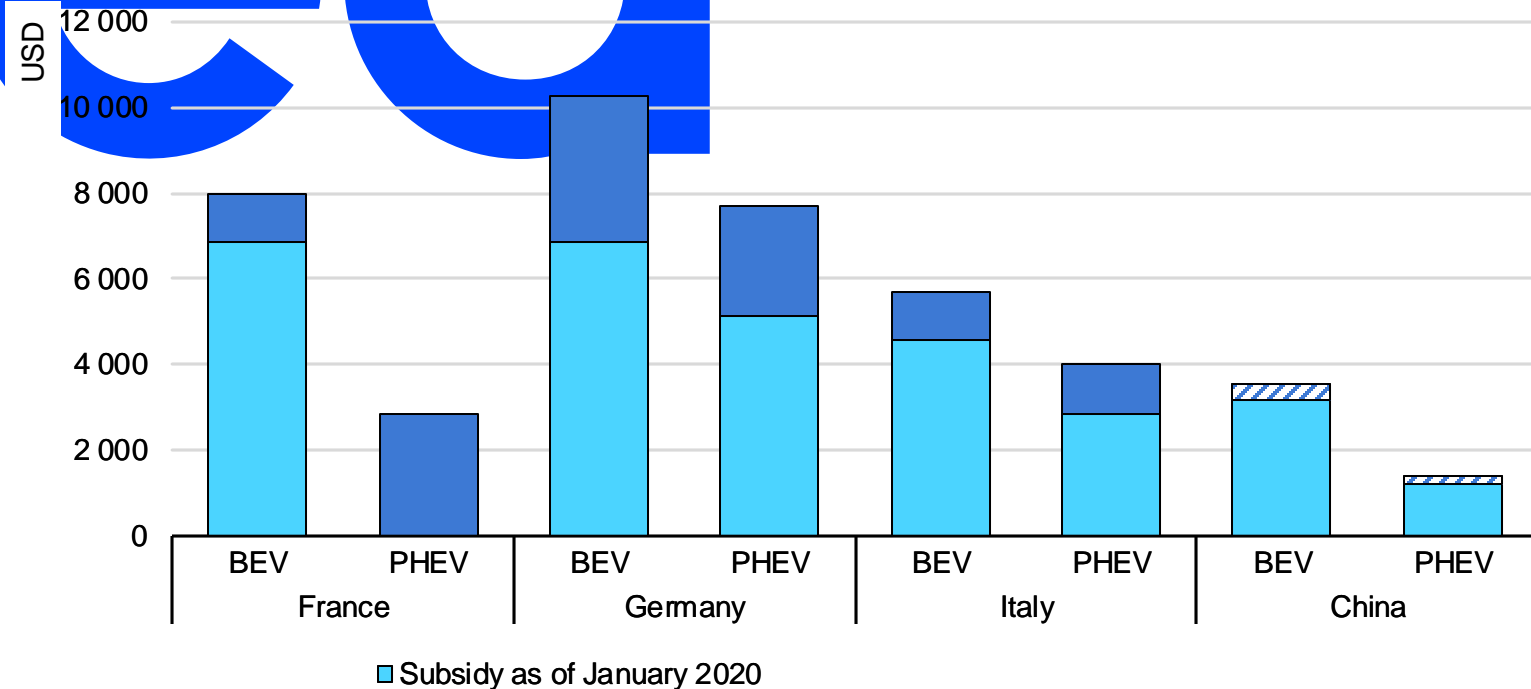
California ZEV mandate from 2035, with other states considering ICE bans.

Federal tax credit of up to USD 7 500.

State level policies such as LCFS, tax credits and purchase incentives.

Subsidies were vital to keeping up EV sales during the pandemic

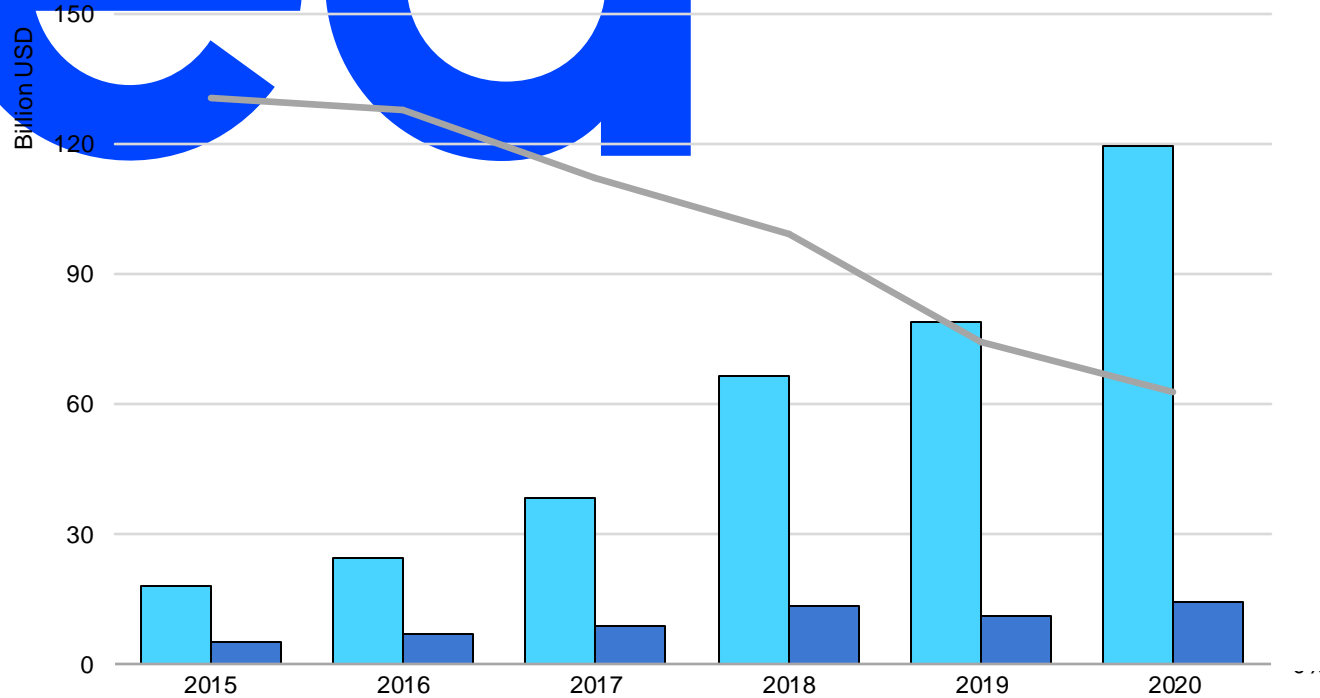
National subsidies for EV purchase before and after economic stimulus measures, 2020



Covid-related stimulus measures including EV purchase incentives played an instrumental role in boosting electric car sales in 2020, particularly in Europe.

Consumer and government spending on electric cars is evolving

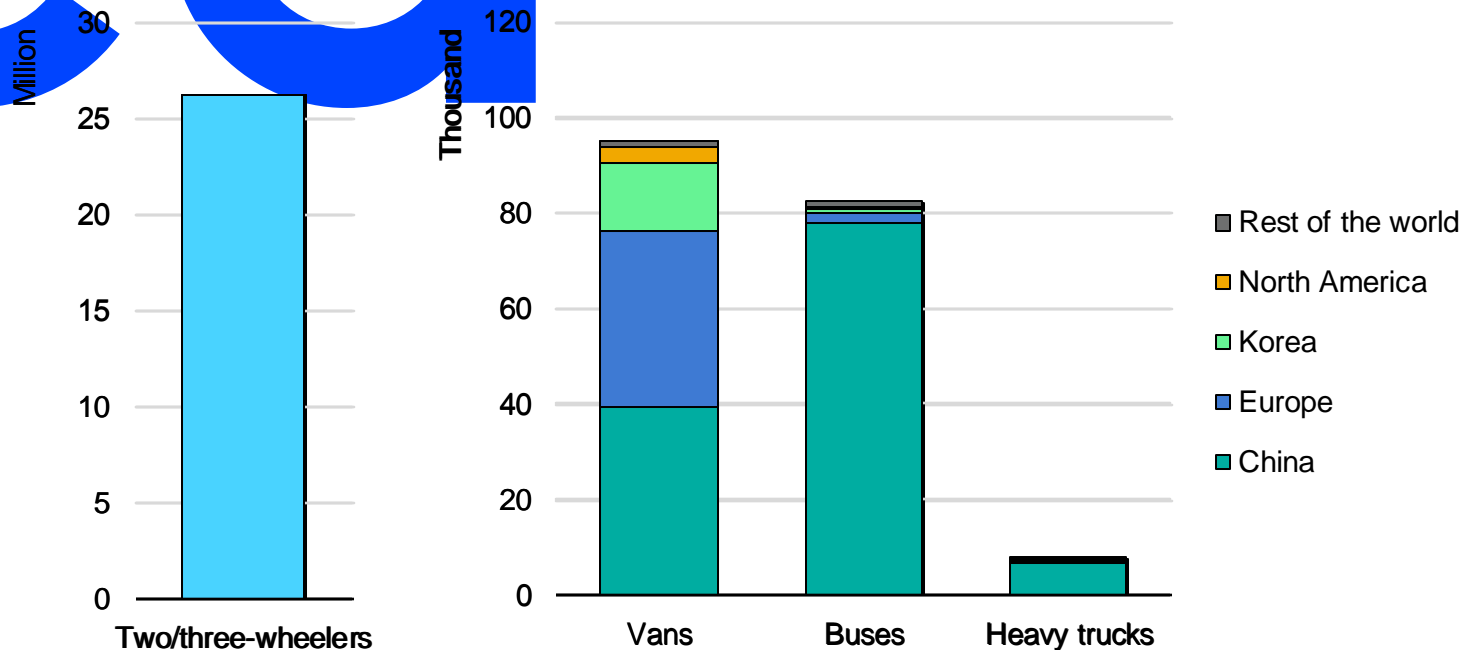
Spending on electric cars by consumers and governments



The share of government incentives in total spending on electric cars has decreased over the past five years, suggesting that EVs are becoming increasingly attractive to consumers.

Road transport electrification is not just about cars

Electric vehicles sales by transport mode and region, 2020

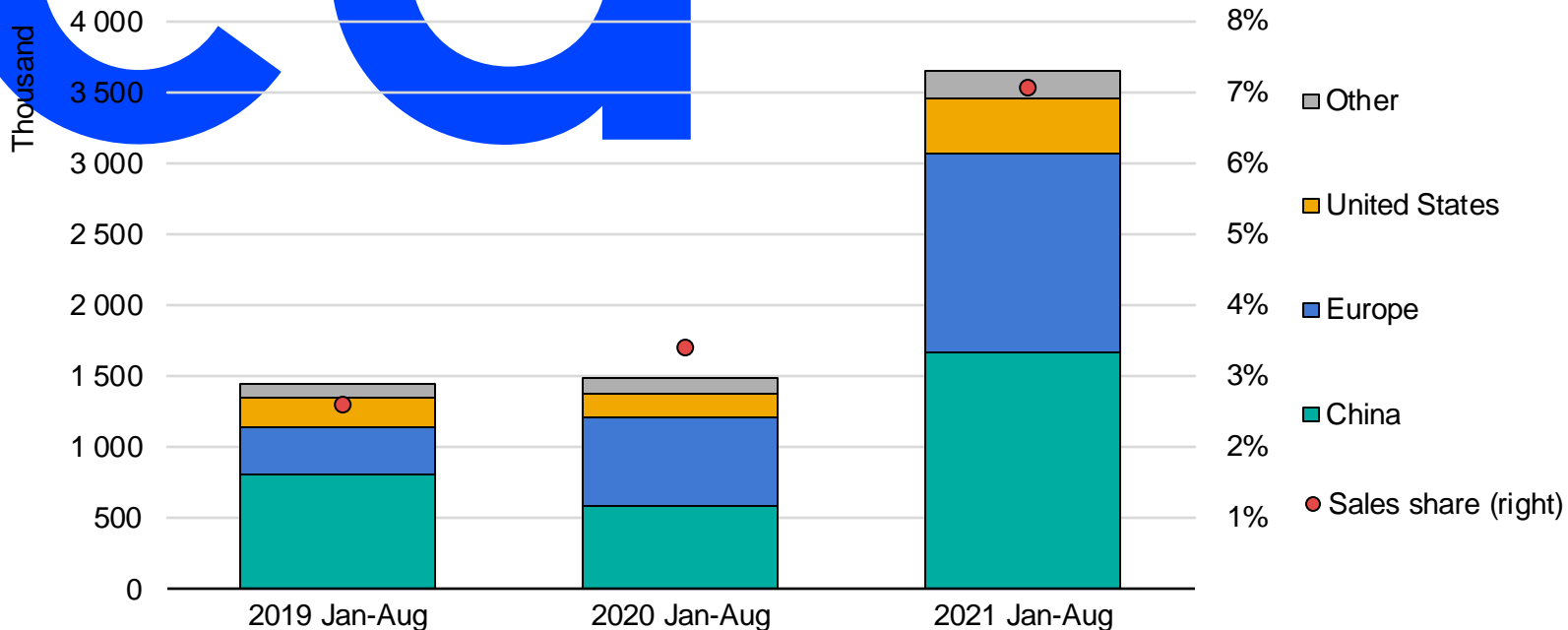


Sales of electric two-and three-wheelers are one order of magnitude higher than sales of electric cars. The electrification of other modes is lagging behind but is rising.

Clear signals of continued momentum in 2021

Recd

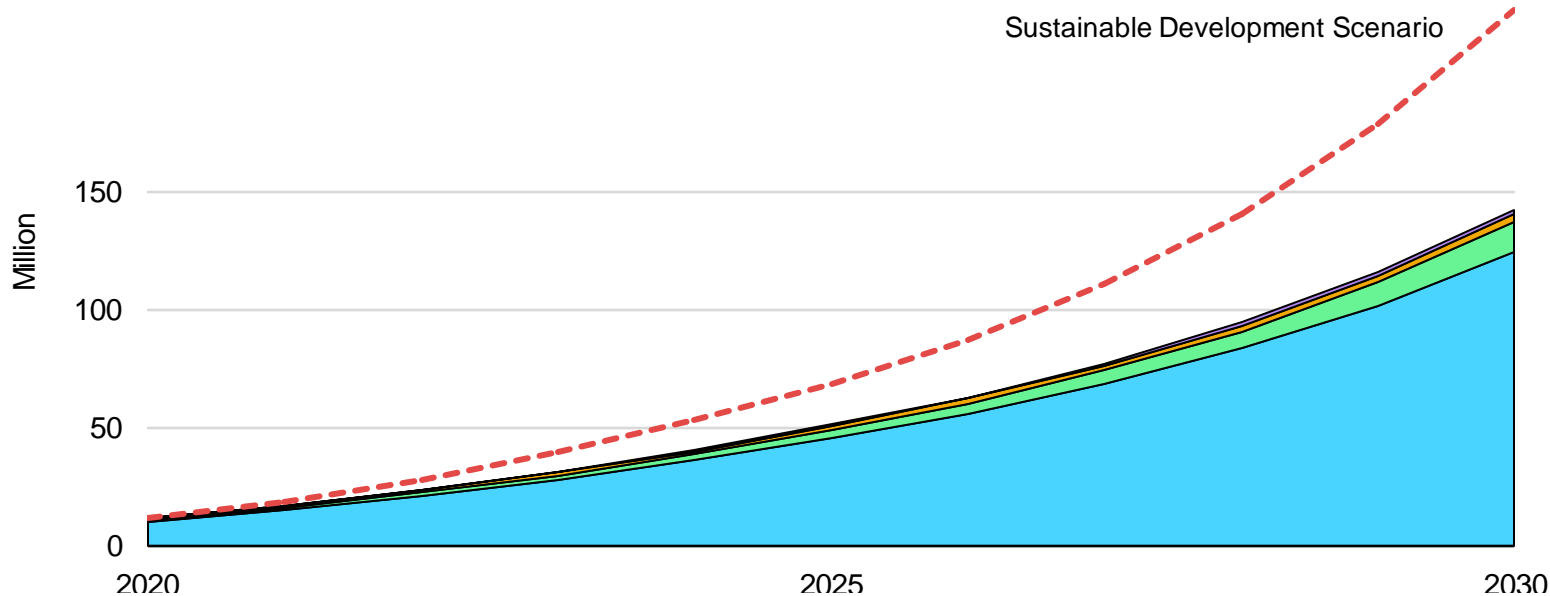
Electric car sales, January-August 2019-2021



Over January-August 2021, electric car sales rose by around 140% compared to the same period in 2020, outpacing the rebound in overall car sales.

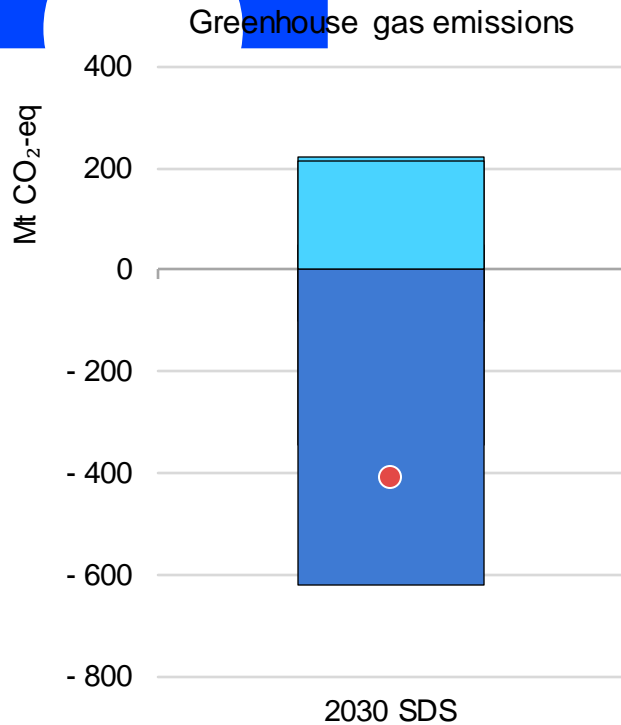
EVs increase across all road transport modes to 2030

Global road EV stock by mode, 2020-2030



The total EV fleet grows to 145 million in the Stated Policies Scenario, up from around 11 million today. The EV fleet could be significantly larger if governments accelerate efforts to reach climate goals.

How EVs support climate goals



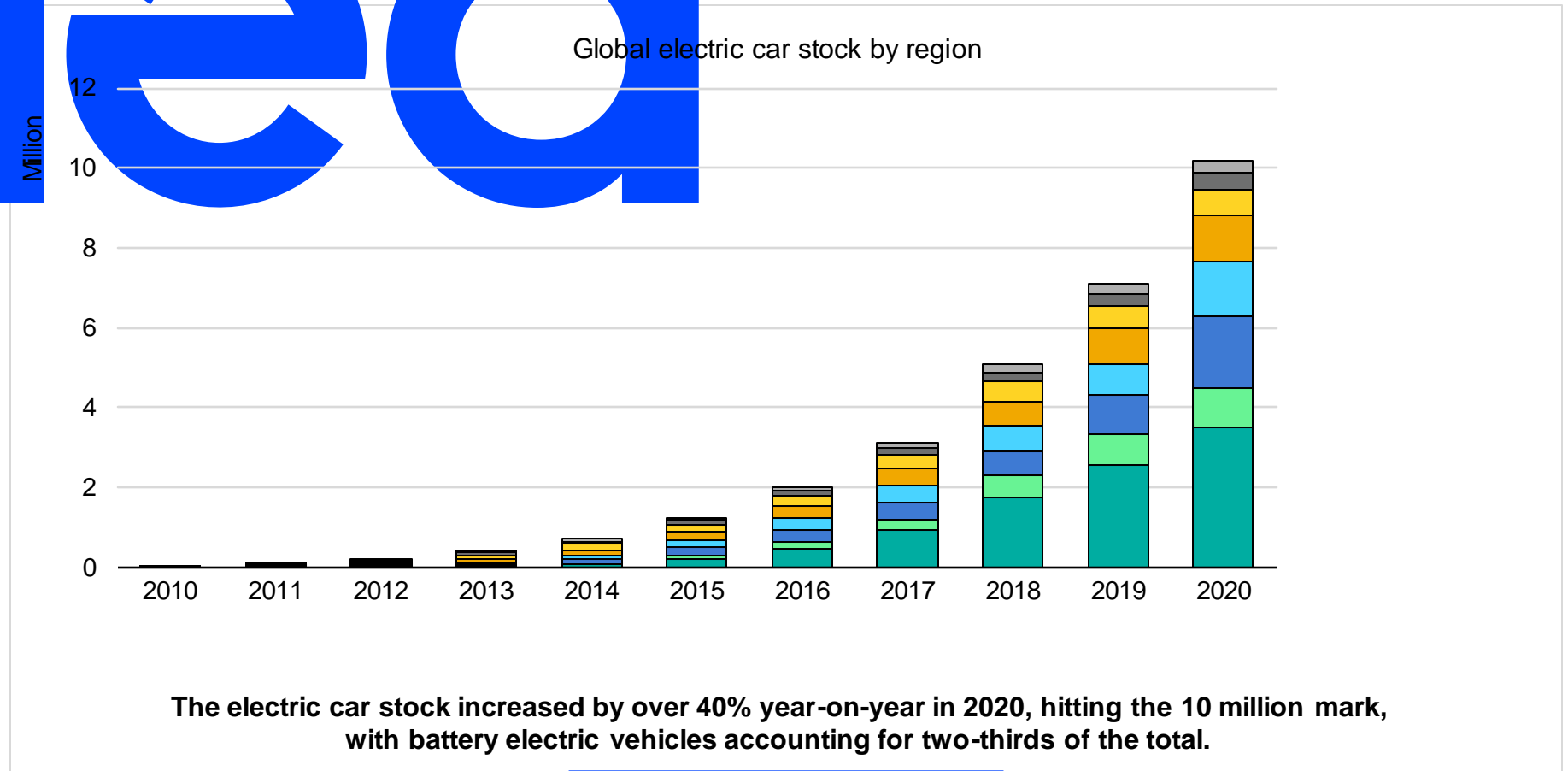
EVs will continue contributing to net reductions in GHG emissions, especially as the electric grid decarbonises.

Conclusions

- Global EV sales in 2020 were resilient to the impacts of the pandemic on the back of existing regulatory frameworks and subsidies; early market signals in 2021 suggest continued momentum in key markets.
- Recovery packages are an opportunity to accelerate the transition to electric mobility across the entire supply chain; in 2020, charging infrastructure roll-out kept pace with EV growth.
- Existing policies & industry plans suggest that the next decade is set to see much more widespread adoption of EVs; but to reach ambitious climate goals, further action is required in three key areas:
 - Accelerate the transition to e-mobility by tightening fuel economy standards, enacting zero-emissions vehicle mandates and/or tax vehicle purchase based on environmental performance.
 - Roll-out recharging infrastructure and develop sustainability frameworks for batteries.
 - Decarbonise power generation to fully reap the environmental benefits of EVs.

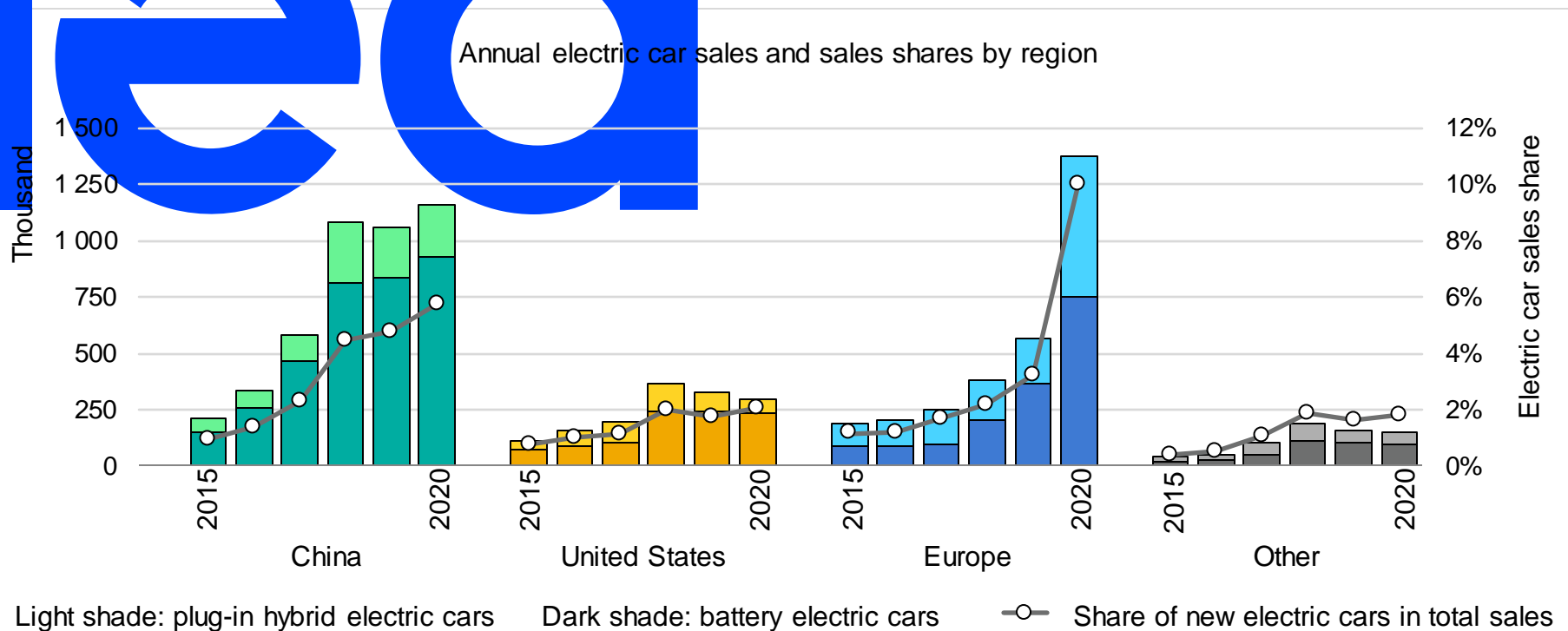
lead

In 2020, the global electric car stock exceeded 10 million vehicles



The electric car stock increased by over 40% year-on-year in 2020, hitting the 10 million mark, with battery electric vehicles accounting for two-thirds of the total.

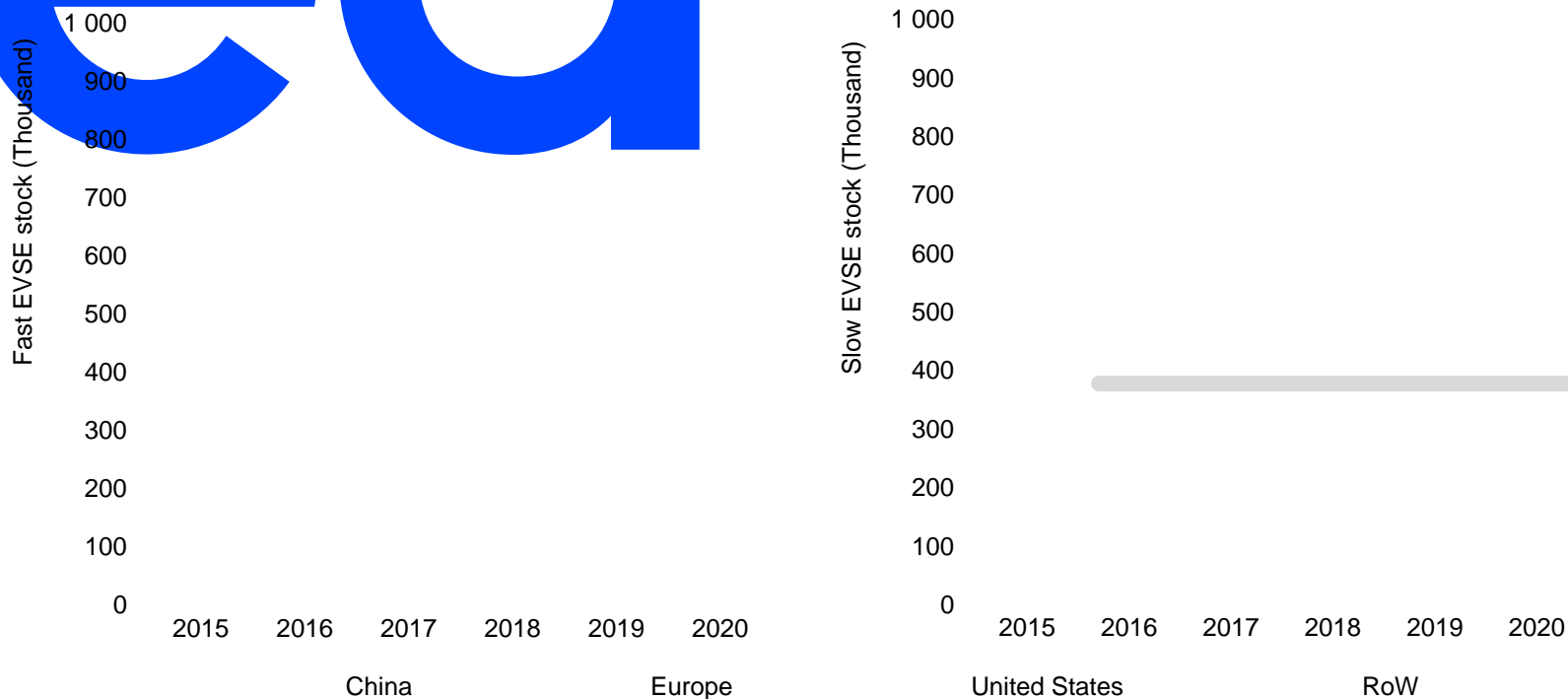
Electric car sales were resilient to the pandemic



**Global electric car sales rose by 41% in 2020 despite falling overall car sales.
Europe became the largest electric car market for the first time, overtaking China.**

Charging infrastructure roll-out kept pace with EV growth in 2020

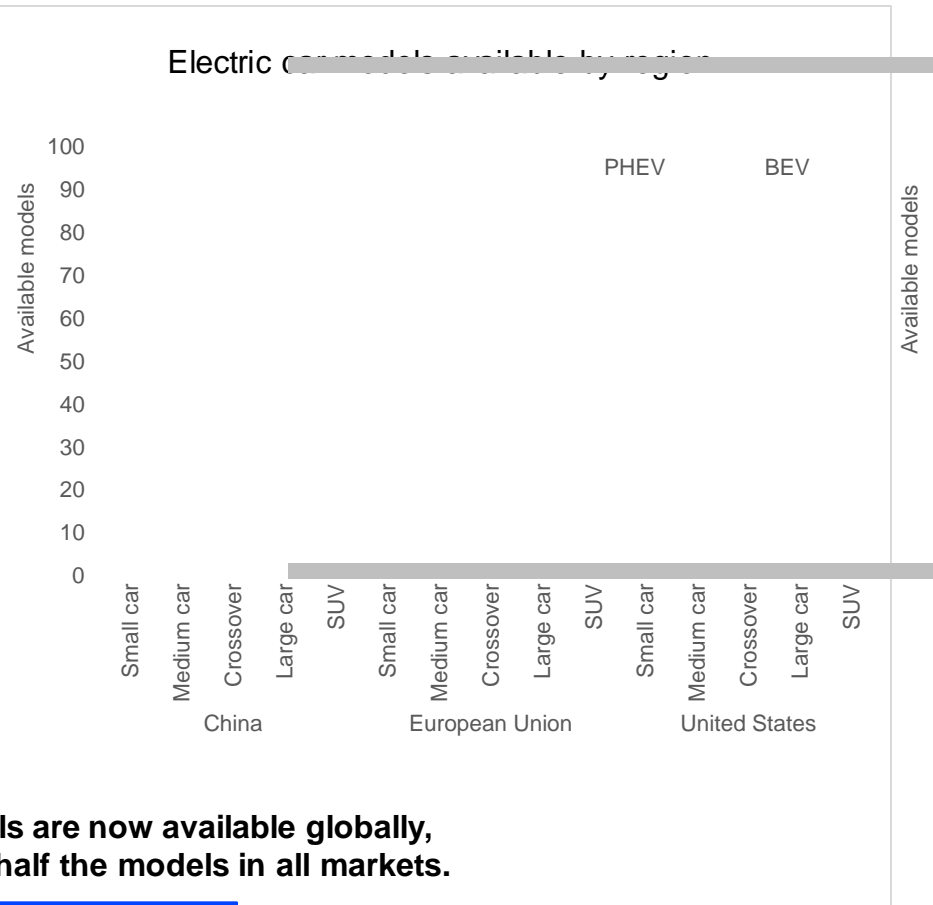
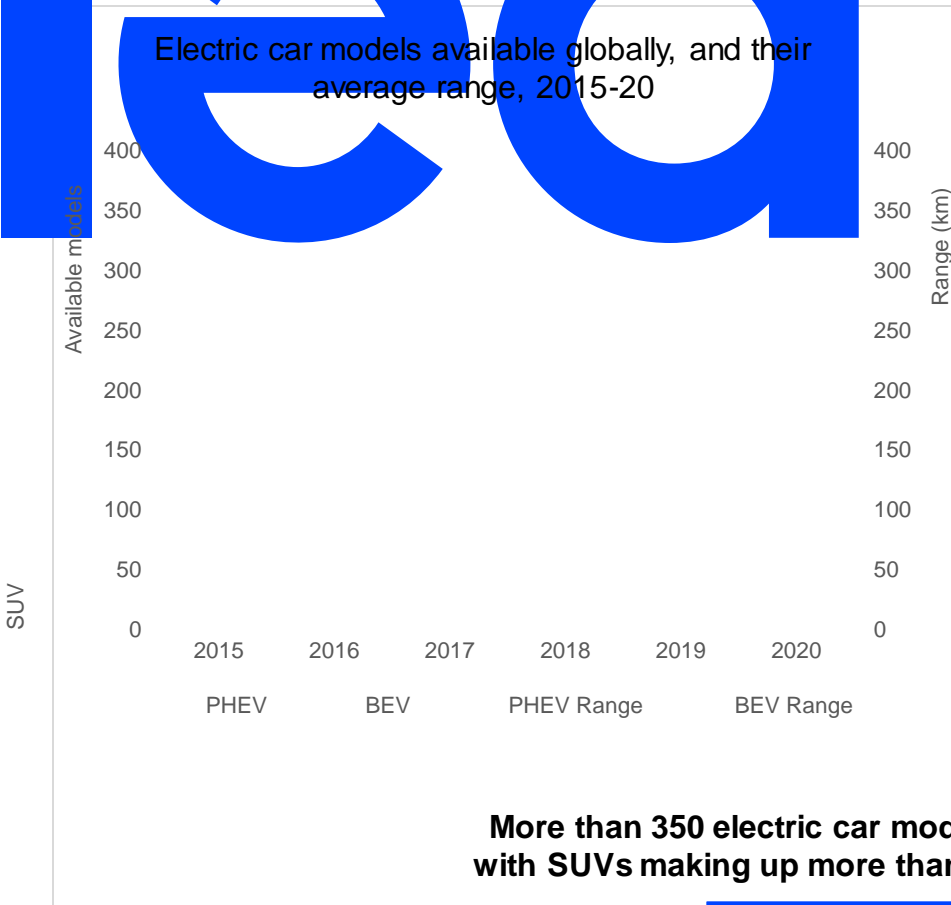
Stock of fast and slow public electric light-duty vehicles chargers



The global stock of public chargers has reached 1.3 million, 30% of which are fast chargers.

The number of electric car models available continues to grow

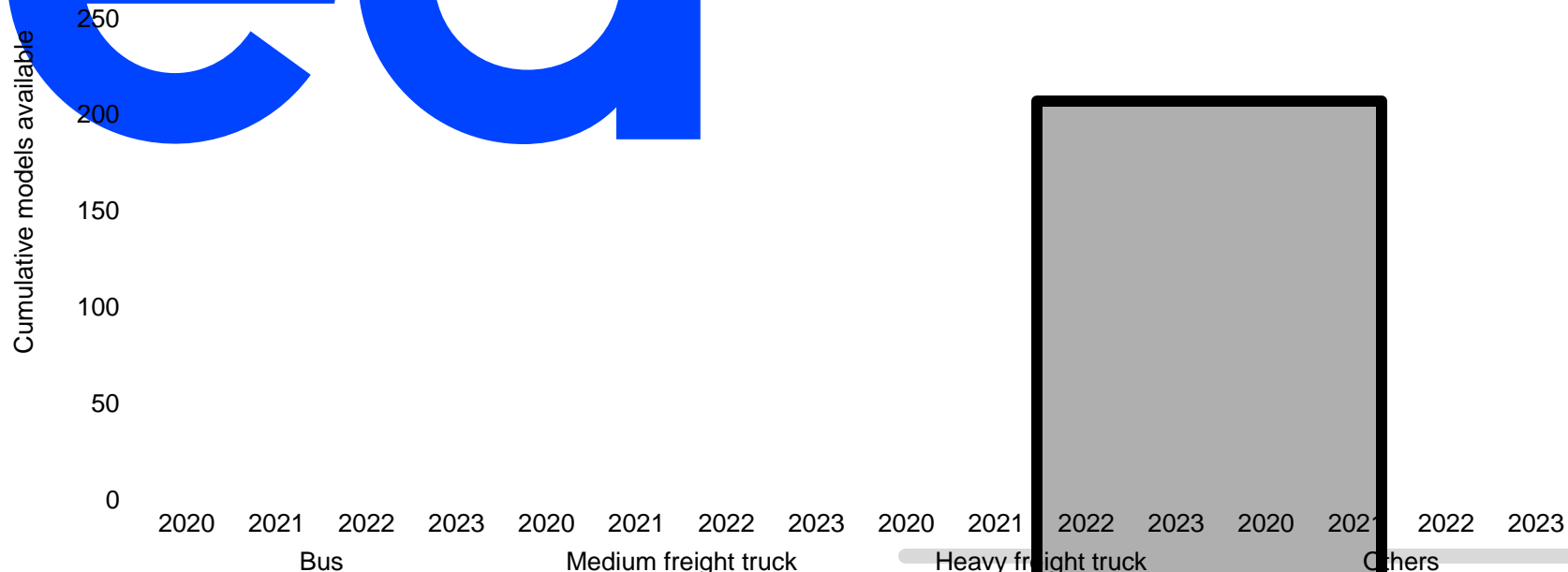
Electric car models available globally, and their average range, 2015-20



More than 350 electric car models are now available globally, with SUVs making up more than half the models in all markets.

The availability of electric heavy-duty vehicle models is broadening

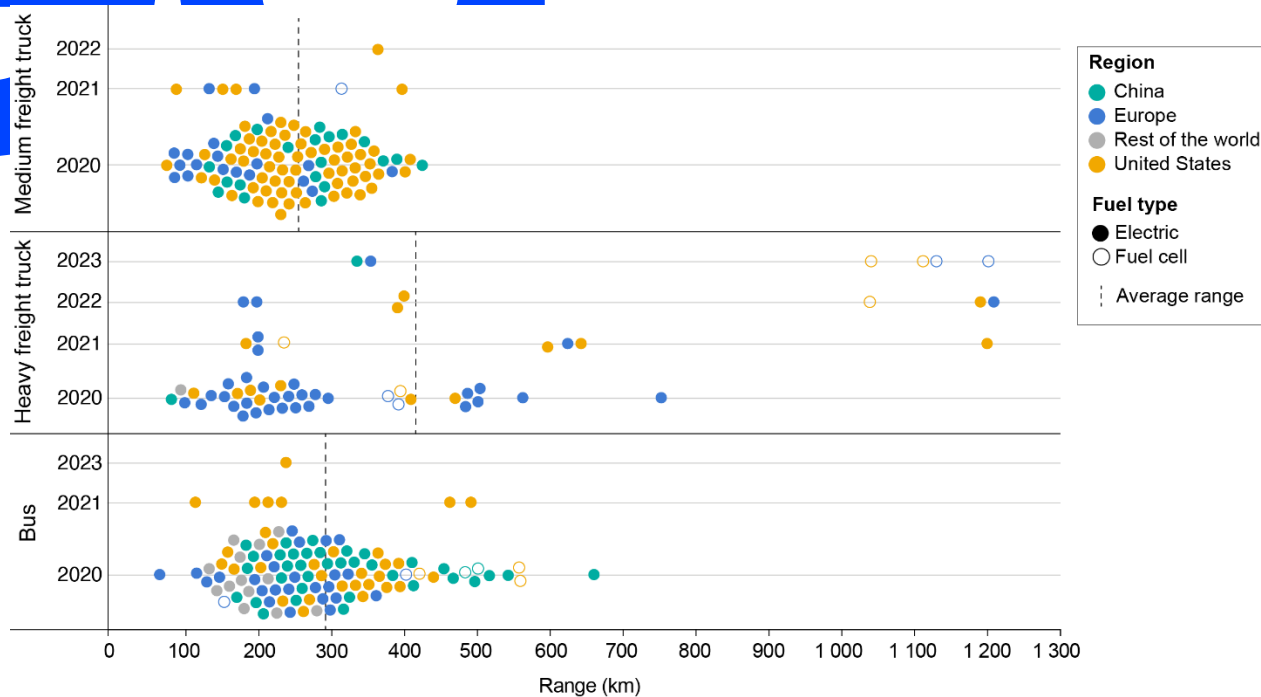
Number of available and announced electric heavy-duty vehicle models by segment and by year



Model availability reflects the early growth in buses, with greater growth in heavier segments as they approach commercialization

More heavy-duty vehicle models with longer ranges keep coming

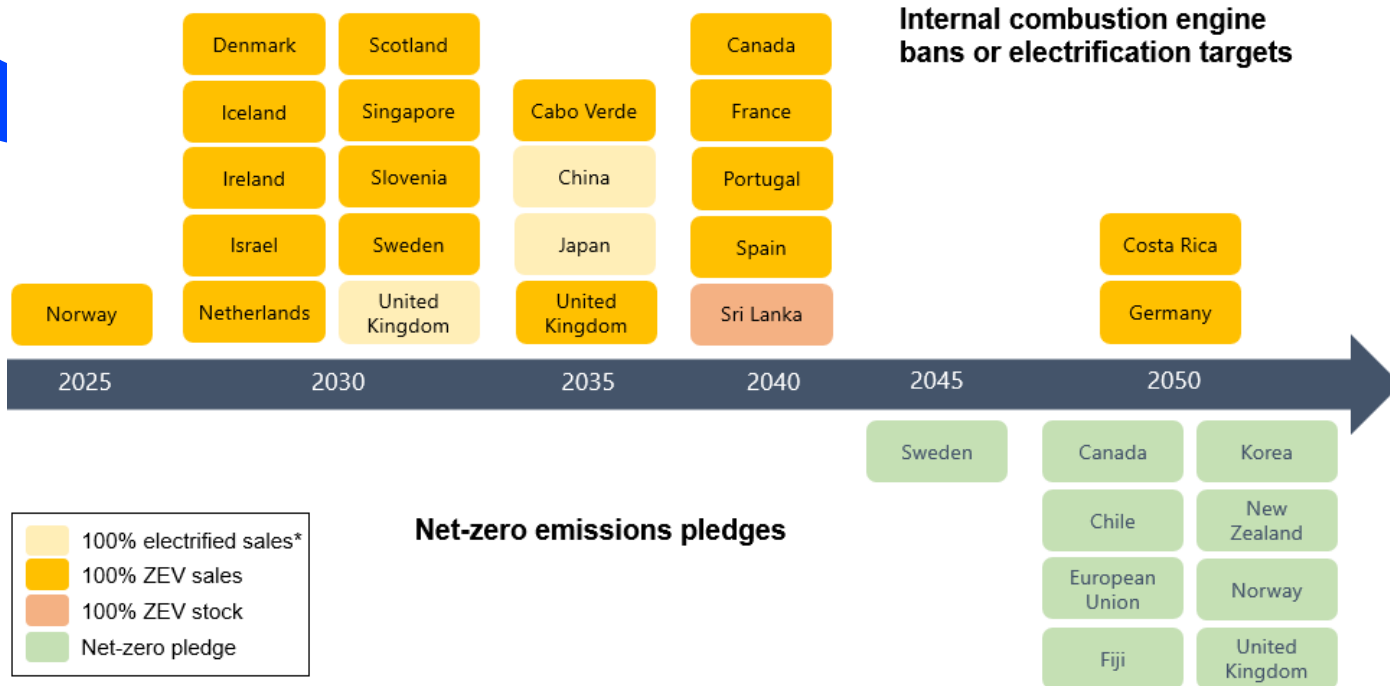
Current and announced zero-emission heavy-duty vehicles by segment, release year and powertrain



Manufacturers' commitments to electrification are demonstrated through diverse offerings, increased range, and new model availability.

More than 20 countries have announced electrification targets

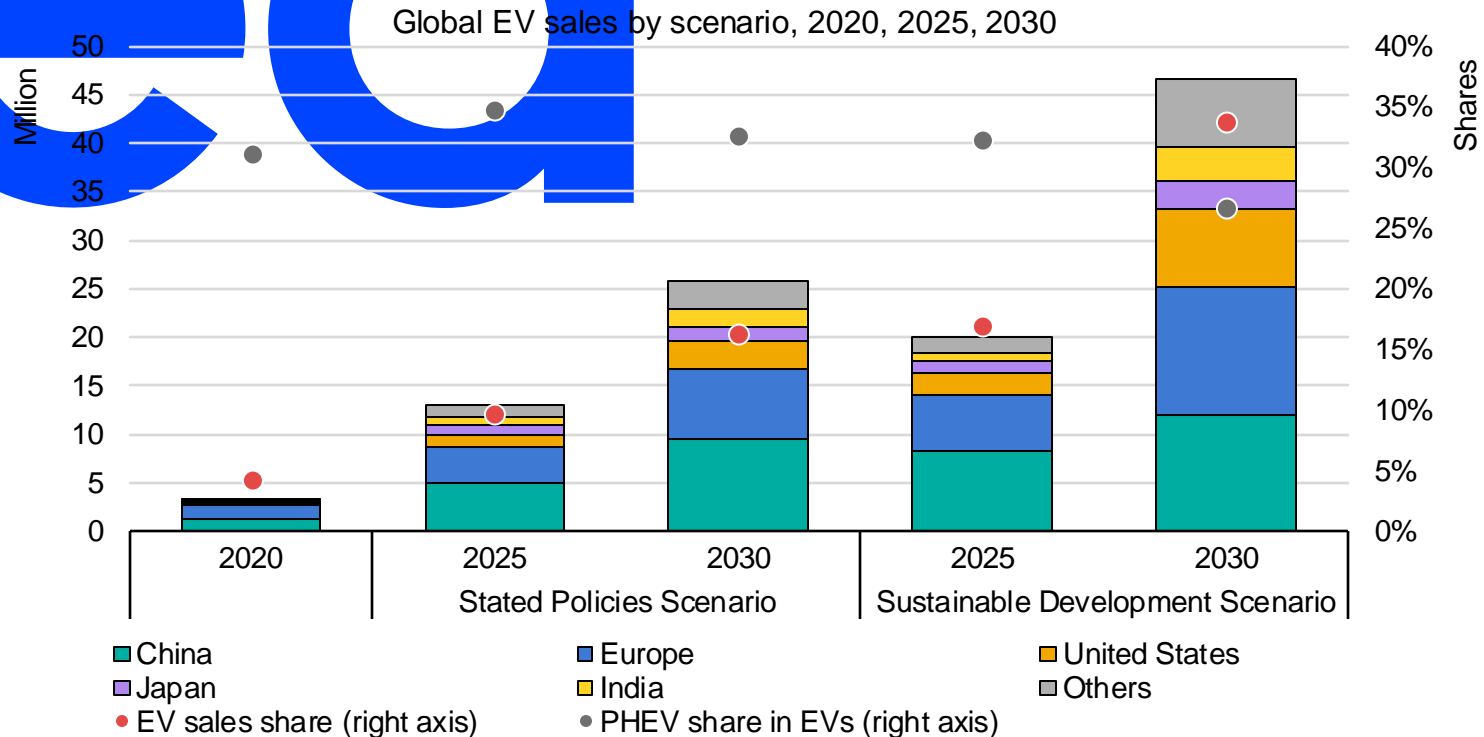
Internal combustion engine bans, electrification targets and net zero emissions pledges



* Electrified vehicles include BEVs, PHEVs, FCEVs and HEVs.

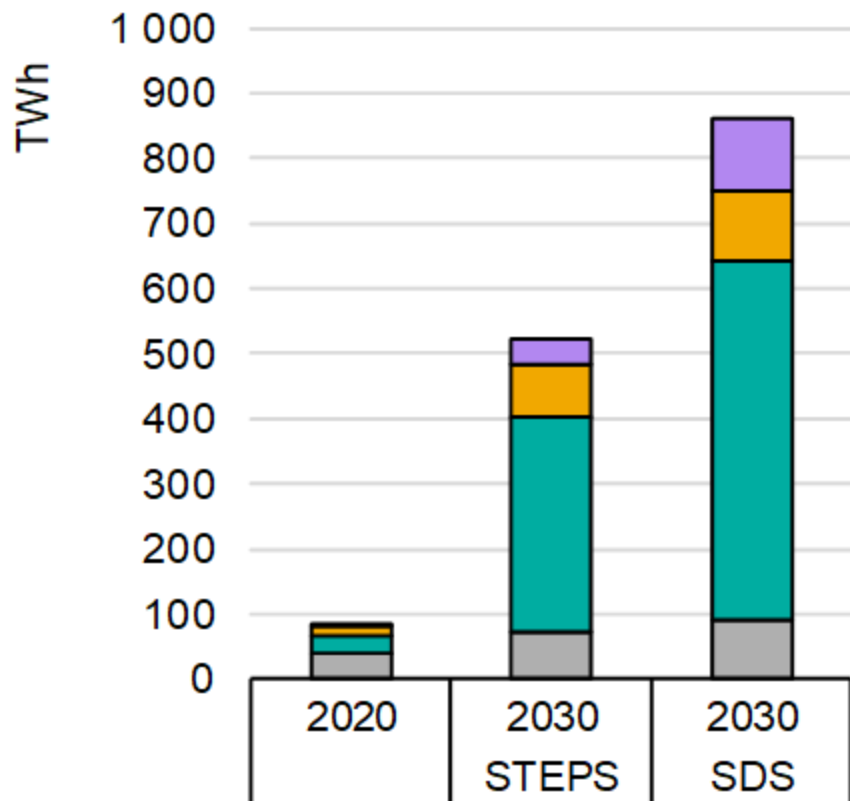
Eight countries and the European Union have proposed or enacted legislation for net-zero emissions by 2050.

EV sales could exceed 45 million per year by 2030

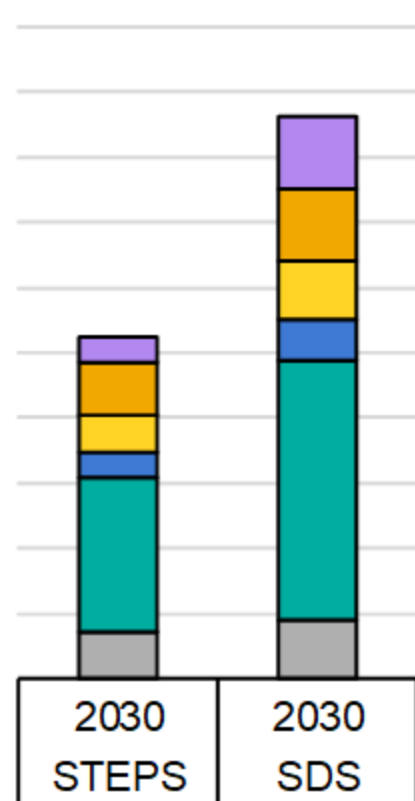


In the Sustainable Development Scenario, the global EV stock reaches 230 million vehicles in 2030 (excluding two/three-wheelers). EV stock share in 2030 reaches 12%.

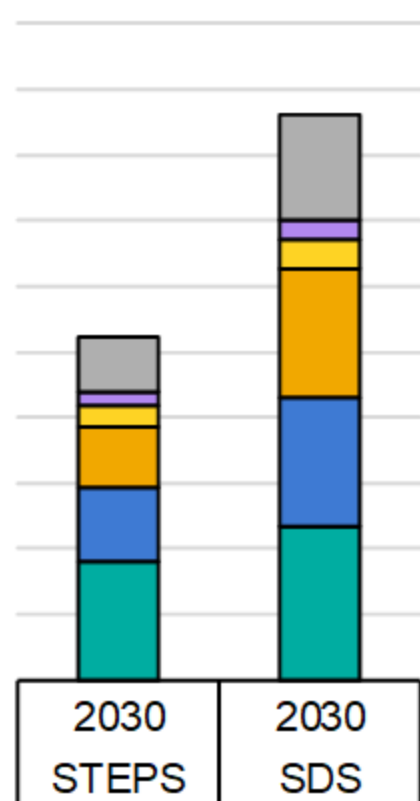
Electricity demand by mode



By charger



By country/region



By mode:

Two/three-wheeler

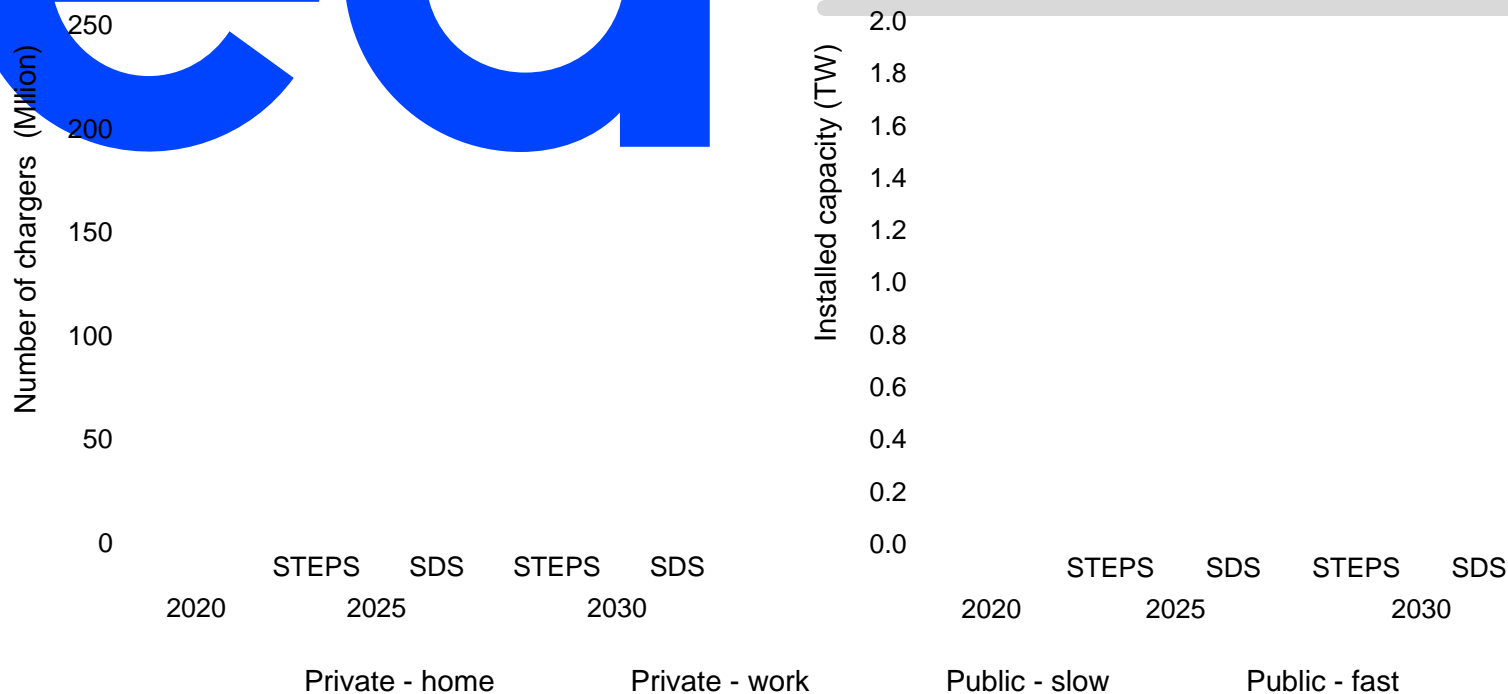
LDV

Bus

Truck

Private charging will dominate future installed electric LDV charging

Number of private and public LDV chargers and associated cumulative installed charging power capacity by scenario, 2020-30



Charging stations for light-duty EVs grow to more 200 million and supply more than 500 GWh by 2030 in the Sustainable Development Scenario, with public fast charging capacity exceeding that of public slow charging