Monthly EV Charging Assessment March 2023

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Contents

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Report methodology and glossary can be found on the final page

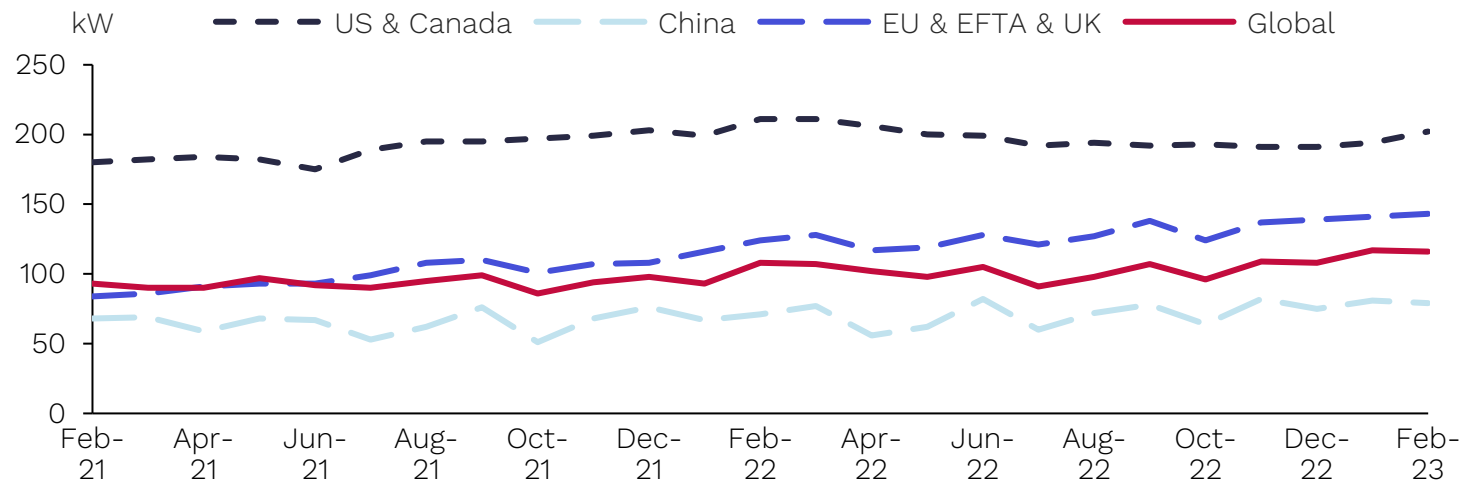
Global EV Charging Developments

- Uber and bp have announced a global mobility agreement to help further the development of charging infrastructure support for the ride-sharing app. The two companies will initially focus on key markets, such as Europe and the US to help maximise efforts to achieve Uber's 2030 target of 100,000 charging points worldwide.
- Morocco has announced plans, via its intersectoral association APIME, to install 2,500 charging stations across the country by 2026. Stations will be concentrated around major cities such as Casablanca and Rabat and will help to support increasing EV imports.
- The British government has announced an additional investment of GBP381 million (USD477 million) to support charging infrastructure in the country as part of a larger energy package. The government is also launching a consultation for its 'ZEV mandate', with the aim of further solidifying the UK's path for the phasing out of ICE vehicles.
- EV charger manufacturer, Flo, has announced it will be investing approximately CAD24 million (USD18 million) into the development of its next-generation Level 2 charger and a new ultra-fast charging station. The company also announced an additional CAD6 million (USD4.5 million) would be provided by the Canadian government to boost support.

Financials/IPO Highlight

INDRA UK-based Indra has announced that is has raised over GBP20 million (USD25 million) as part of its Series B funding round to support its development in bi-directional charging. Gulf Oil International led the investment round. The company will continue to focus its efforts on the UK market.

Sales weighted average maximum BEV charging speed



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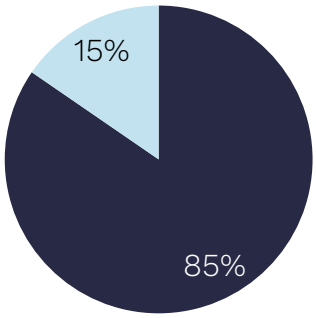
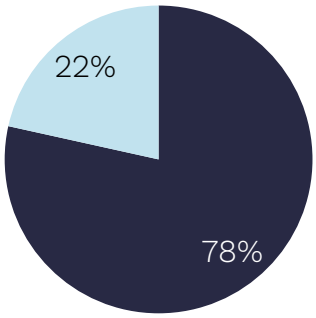
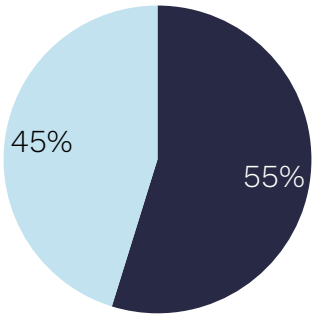
EU & EFTA & UK public charging points by power



North America public charging points by power



China public charging points by power

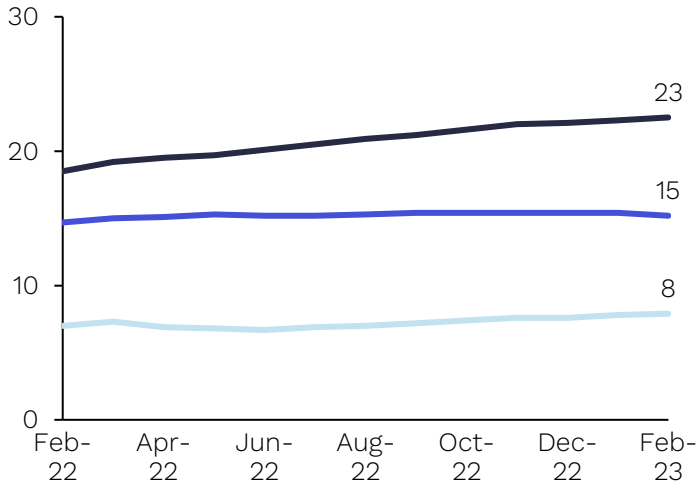


Slow charge (<=22kW) Fast charge (>22kW)

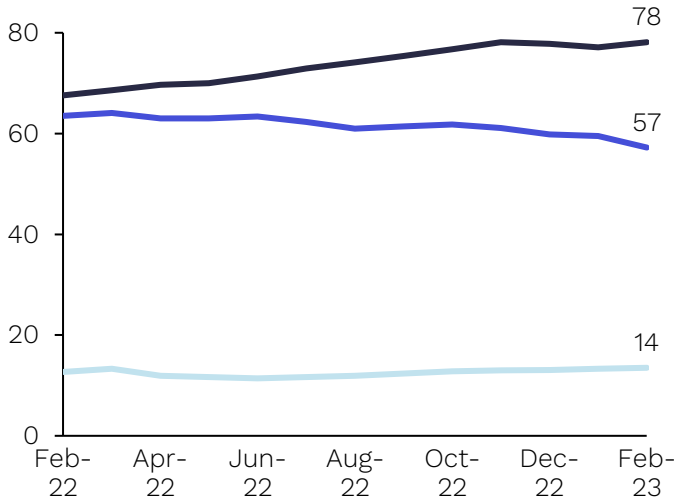
Regional Public Charging Point Ratio

North America China EU & EFTA & UK

EVs per public charging points



BEVs per public fast charging points



Global Infrastructure summary by charging power, January 2022

	EU & EFTA & UK	North America	China
Total Public Chargers	**520,437**	**152,885**	**1,760,800**
Slow charge (<=22kW)	440,197	119,967	964,800
Fast charge (>22kW)	80,240	32,918	796,000
Additional Residential Chargers	137,892	87,959	109,423
Additional Workplace Chargers	19,721	8,181	38,114

EV Charging Developments: EU & EFTA & UK

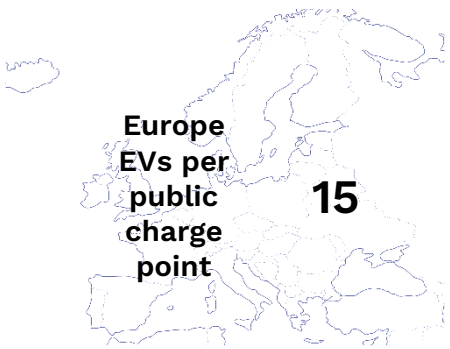
- bp pulse has partnered with French real estate company Compagnie de Phalsbourg to construct over 25 HPC charging sites by 2025. The 25 sites will be located at busy hubs, such as shopping centres and near highways and will be equipped with 300kW charging stations.

- Tesla installed its first V4 Supercharger in the Netherlands in March. The 16 charging stations in Harderwijk will also be opened to third-party EV models in the near future. Compared to the V3, the V4 sports a larger housing to account for the longer cable, which will further support third-party usage.

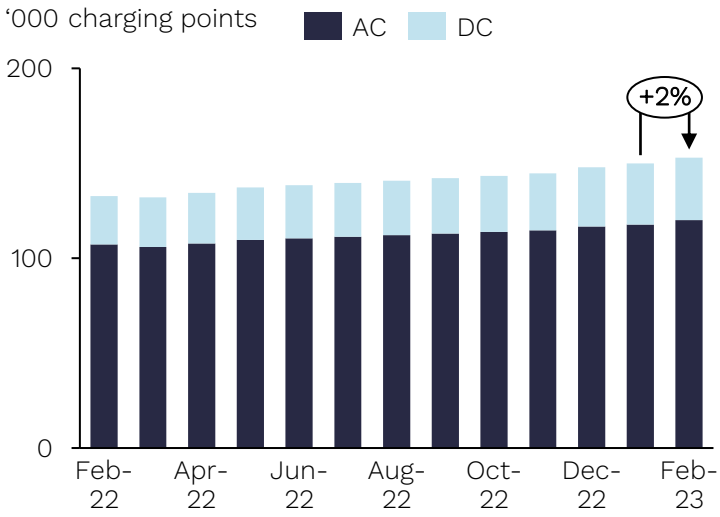
- The European Union has announced it will provide ~EUR189 million (USD209 million) to construct 2,000 new charging points across the TEN-T network, in addition to adding 63 new H2 refuelling stations. So far, 26 projects have been selected for implementation and will be spread across 12 member states. The projects will primarily target cars, trucks and busses, with four of the projects also looking into the electrification of ground handling services at local airports.

- Engie has formed a joint venture with Ceva Logistics and SANEF to construct a network of charging and refuelling stations for electric trucks across European motorways.

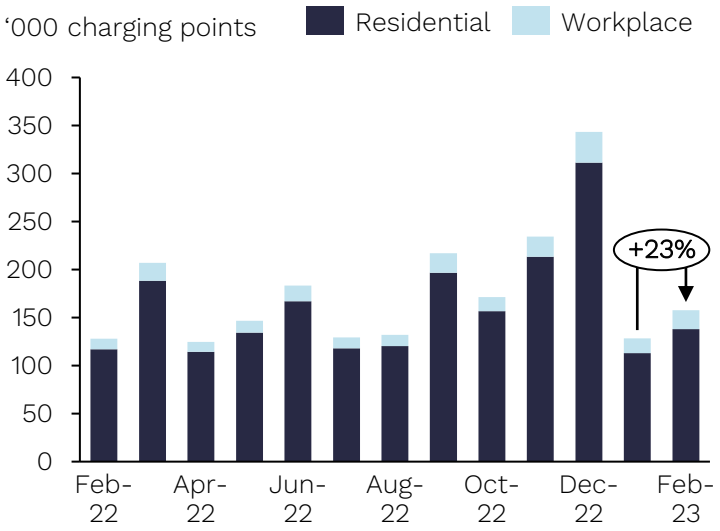
Public Charging Network development



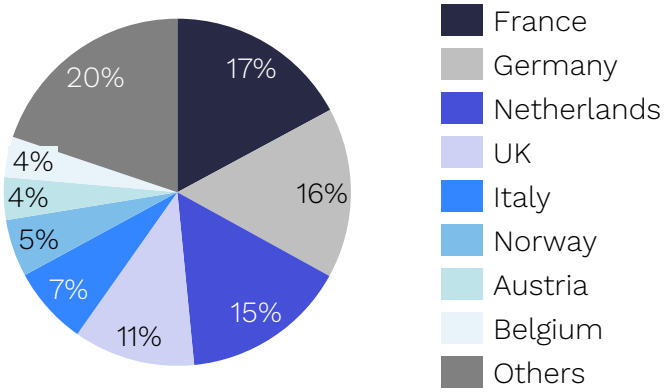
Public chargers by power



Monthly residential and workplace chargers

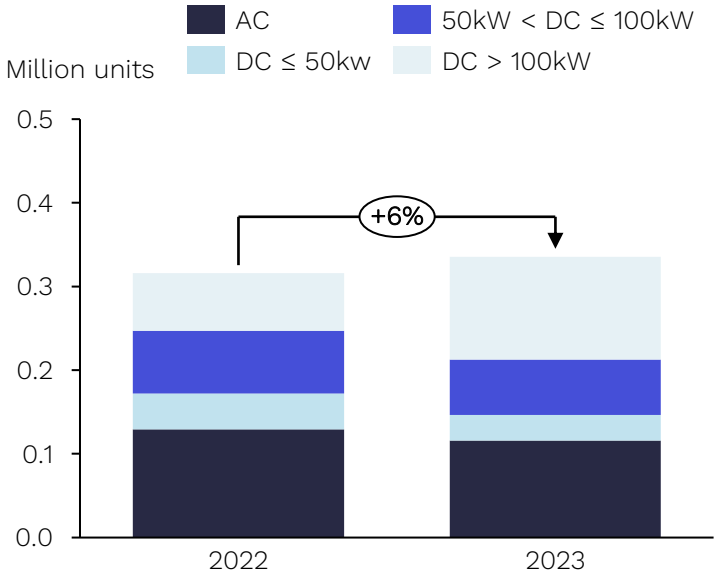


Public charging share by country

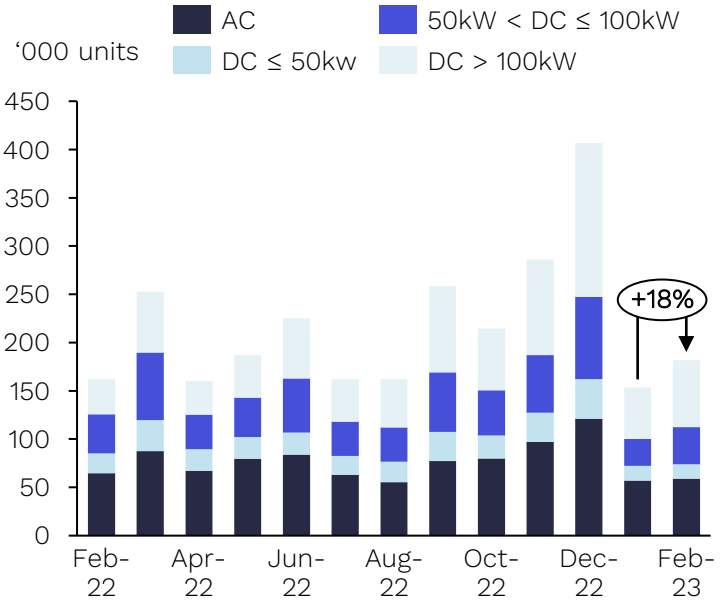


- In the EU & EFTA & UK, PC & LDV sales remained low in February, despite a recovery on January figures. In February, approximately 182,000 PC & LDV units were sold, an 18% increase on the previous month.
- Sales weighted average maximum BEV charging capability increased from 141kW in January to 143kW in February due to a strengthening in sales of EVs capable of charging over 100kW. The average charging speed increased m-o-m to 141kW in February.

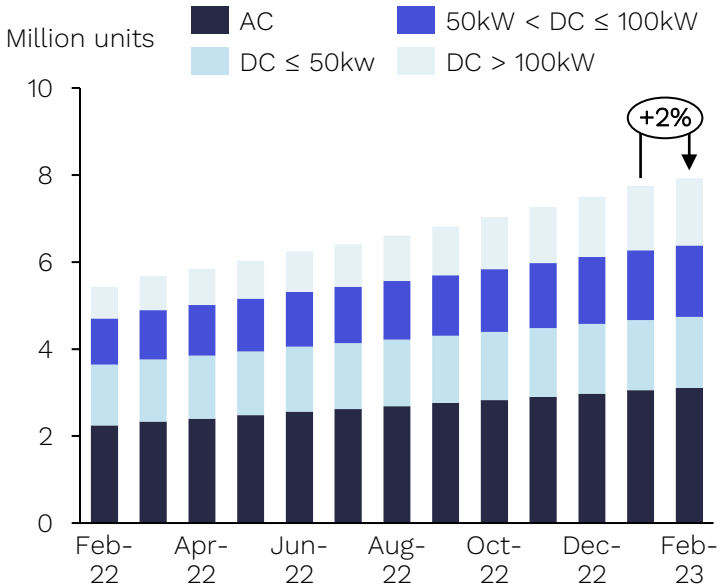
EU & EFTA & UK Year-to-date PC & LDV EV sales



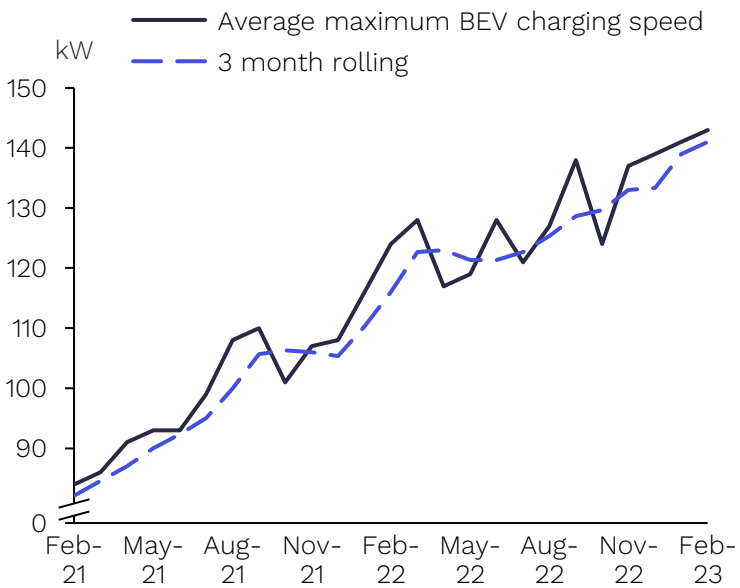
EU & EFTA & UK Monthly PC & LDV EV Sales



EU & EFTA & UK Monthly PC & LDV EV Fleet Assessment



EU & EFTA & UK PC & LDV average BEV charging speed

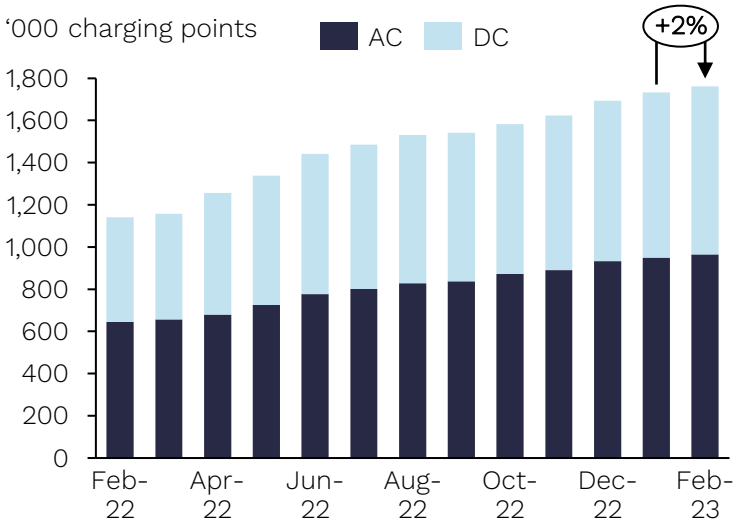


EV Charging Developments: China

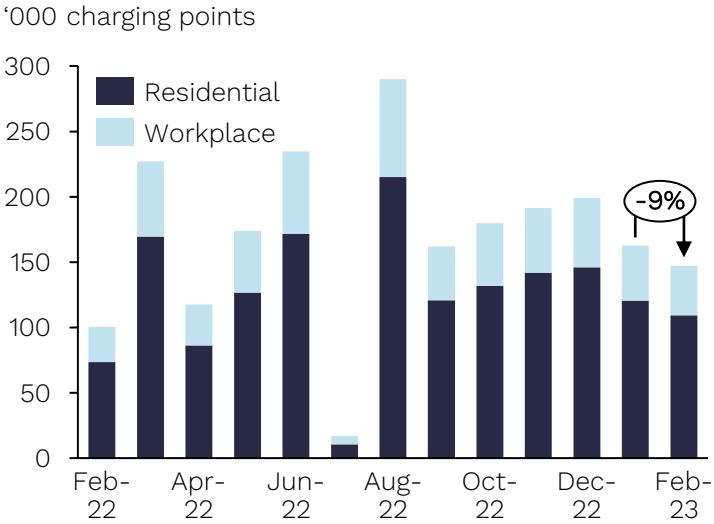
- NIO's first third-generation battery swapping station was put into operation by the Shangri-La Hotel in Hainan. Nine other 3.0 battery swapping stations will be completed soon, and there will be ten operational 3.0 battery swapping stations by early April 2023.
- In 2023, NIO plans to build 1,000 new battery swapping stations across China, 90% of which will be third-generation battery swapping stations. NIO also confirmed that it will not upgrade the current 2.0 stations because the priority is to add new stations and expand the battery swapping network.
- NIO has also deployed its latest 500kW ultra-fast chargers for the first time next to the new battery swapping station.
- China-based NaaS Technology has launched a charging robot in the country, which provides a portable, automated solution for EVs unable to reach fixed charge points. Once depleted, the robot will use its location services to find a nearby charge point to plug into to recharge. The technology, if made widespread, could help to alleviate charging bottlenecks by providing greater flexibility.

Public Charging Network development

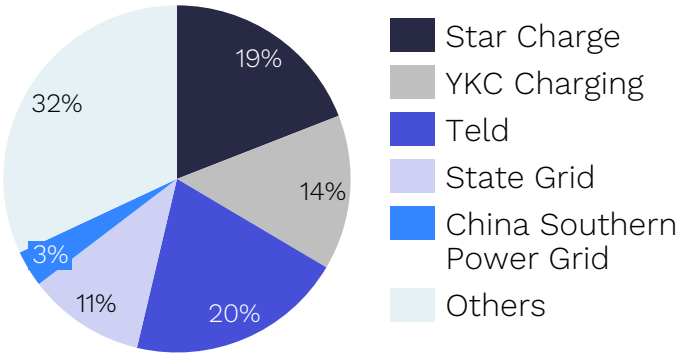
Public chargers by power



Monthly residential and workplace chargers



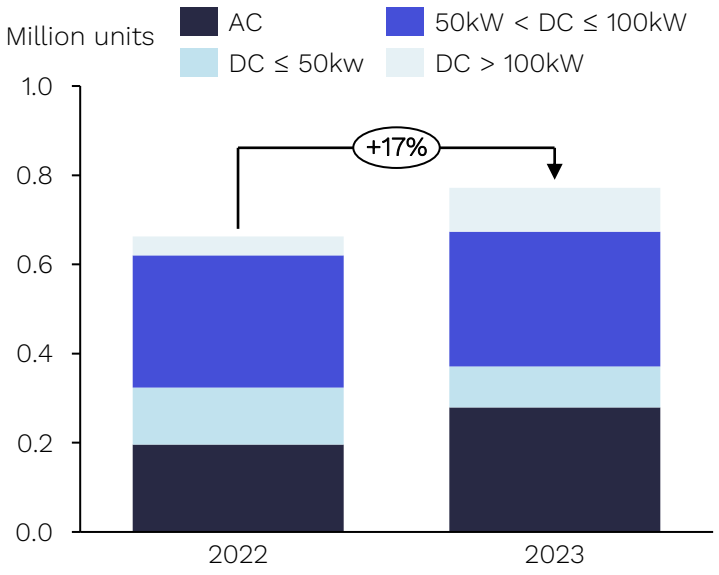
Charging network share in China



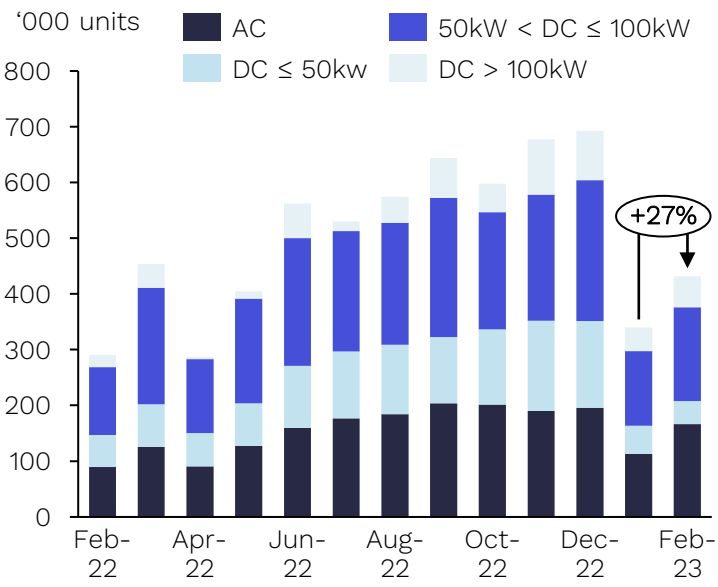
- December China EV sales increased on January following a slow start to the year, although February sales remain low relative to the end of 2022. Across the month, sales reached ~432,000, a 27% increase on January. This month also saw the release of the Zeekr 009 in China, the first vehicle to be fitted with the new Qilin battery from CATL.

- Sales weighted average maximum BEV charging capability decreased from 81kW in January to 79kW in February.

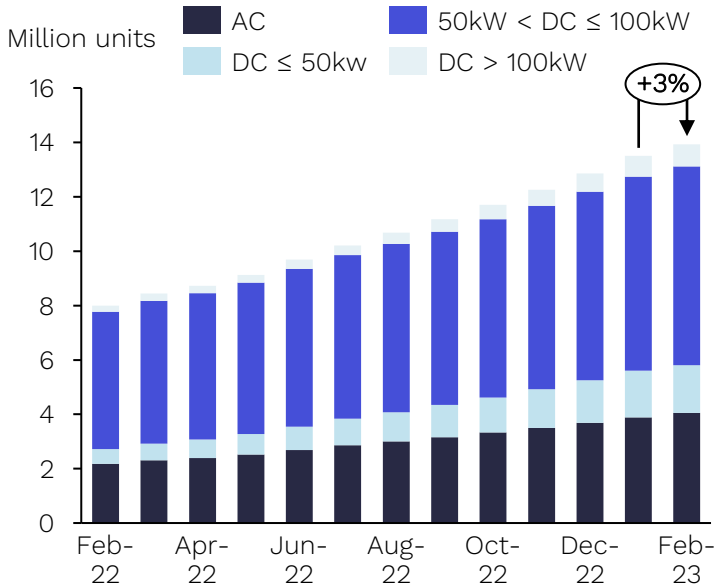
China Year-to-date PC & LDV EV sales



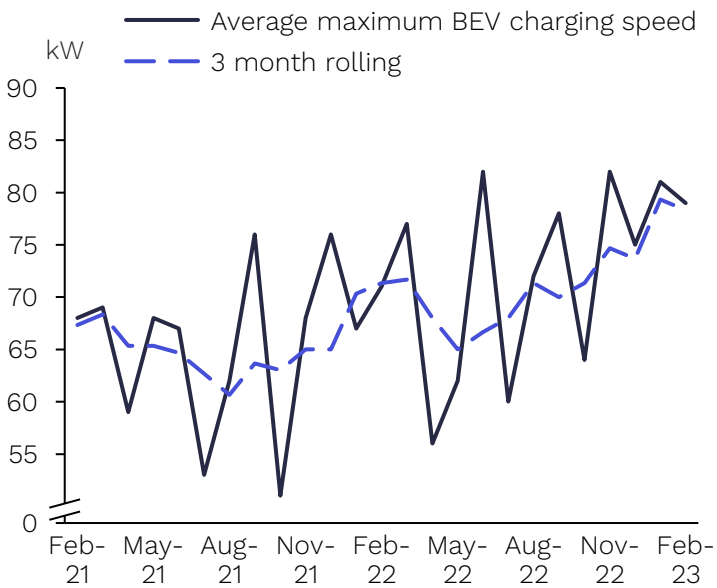
China Monthly PC & LDV EV Sales



China Monthly PC & LDV EV Fleet Assessment



China PC & LDV average BEV charging speed



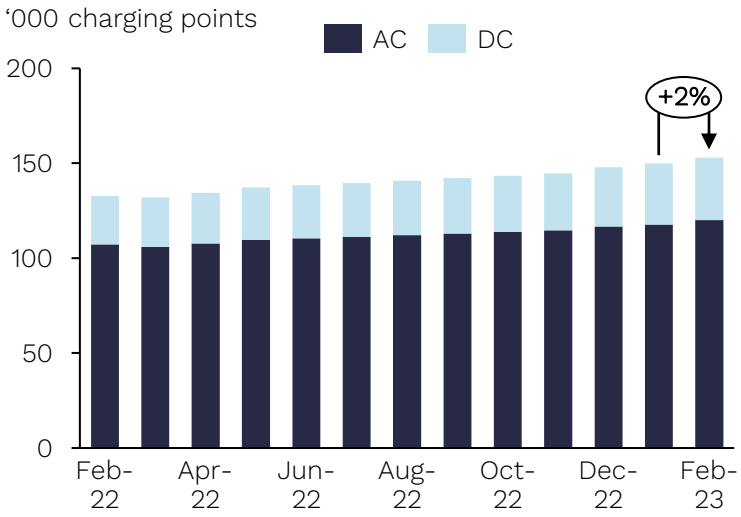
EV Charging Developments: North America

- Mercedes-Benz has announced it plans to begin building its own fast chargers before the end of the year, in order to better support its goals of constructing a HPC network across multiple markets. Development is set to begin in Q4 2023, beginning with the US, Germany and France. This should also grant Mercedes access to incentives under the IRA and NEVI Formula Program.

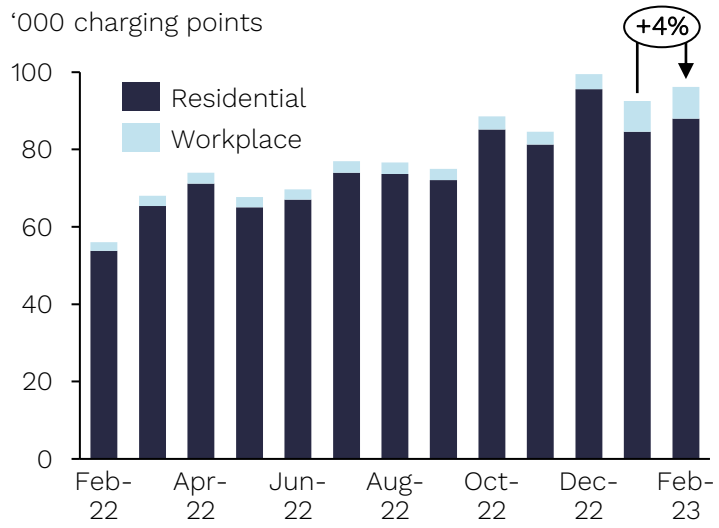
- Tritium has launched its new charging system in the US which comprises of four of Tritium's 150kW PKM150 charging stations and two power rectifiers. The offering is the first to be designed in accordance with the NEVI Formula Program and will be able to power four vehicles simultaneously.

- The US government has announced USD2.5bn in new grants for the construction of charging infrastructure in underserved communities. The Charging and Fueling Infrastructure (CFI) Program will distribute the funds over a five-year period and will be split over two areas. The first half will specifically target developing local charging points in underserved communities. The other half will be used to target highway implementation in areas that require further support and development. The funding outlined under the CPI Program is in addition to the previously-announced USD5 billion of funding in the Infrastructure Bill.

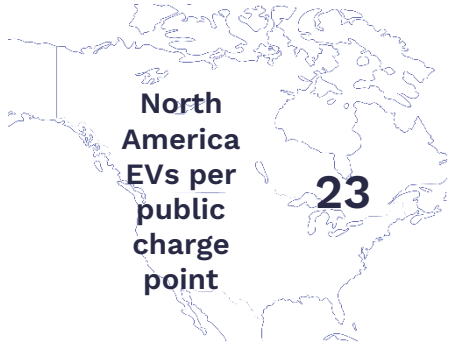
Public chargers by power



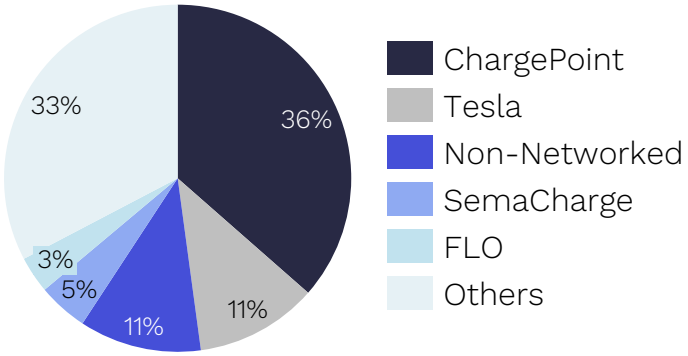
Monthly residential and workplace chargers



Public Charging Network development

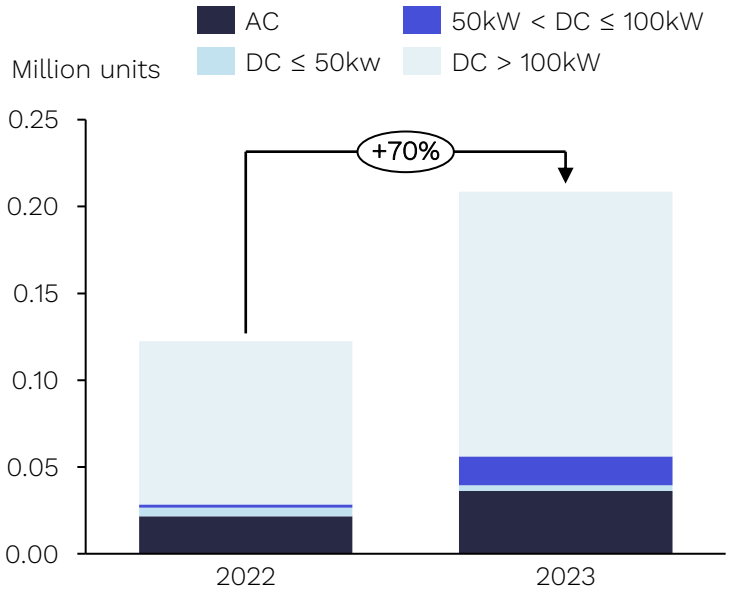


Charging network share in North America

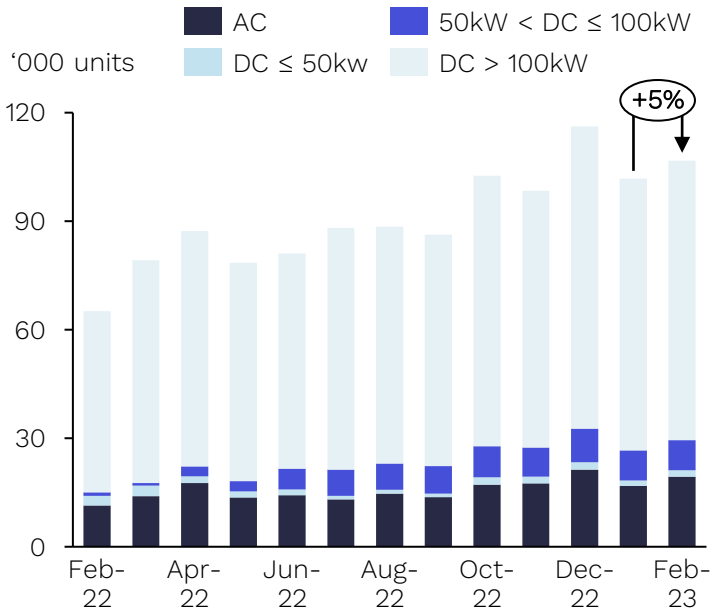


- February was a strong month for EV sales in the US and Canada with over 106,000 units sold, a 5% increase on January figures and the second-strongest month on record.
- Sales weighted average maximum BEV charging capability increased sharply from 194kW in January to 202kW in February. The three-month average charging speed increased slightly m-o-m from 192kW in January to 196kW in February.

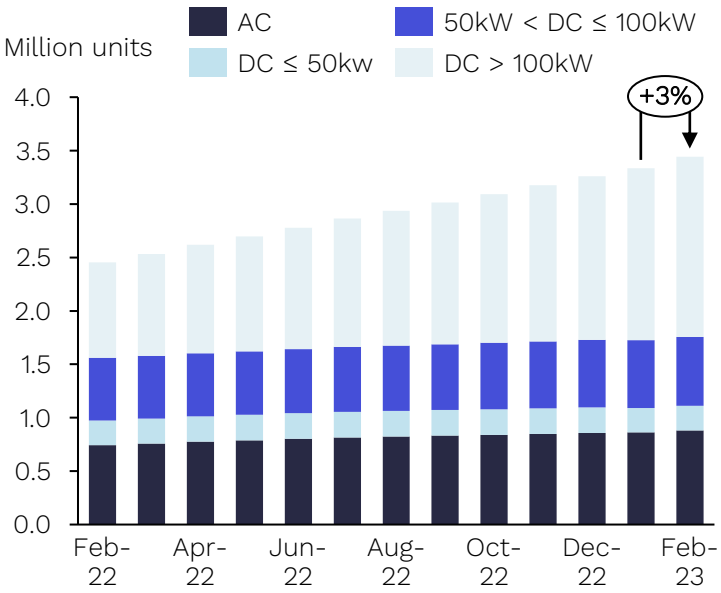
North America Year-to-date PC & LDV EV sales



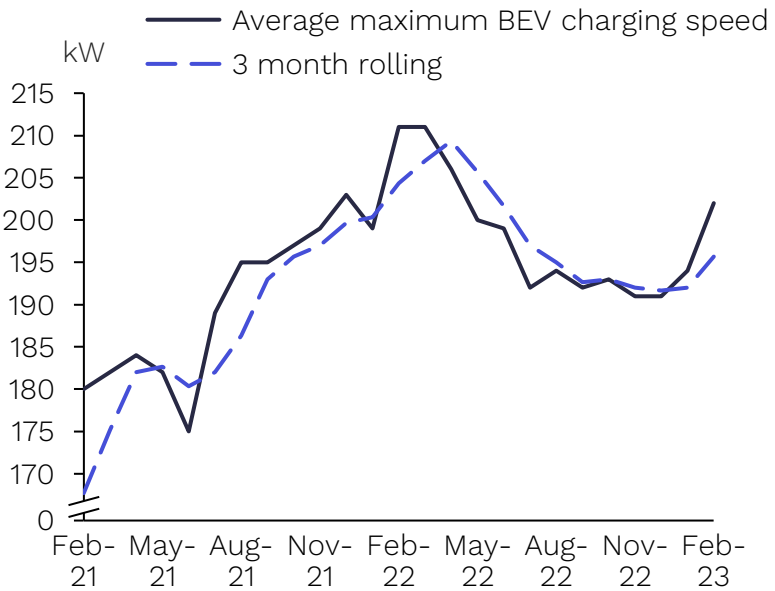
North America Monthly PC & LDV EV Sales



North America Monthly PC & LDV EV Fleet Assessment

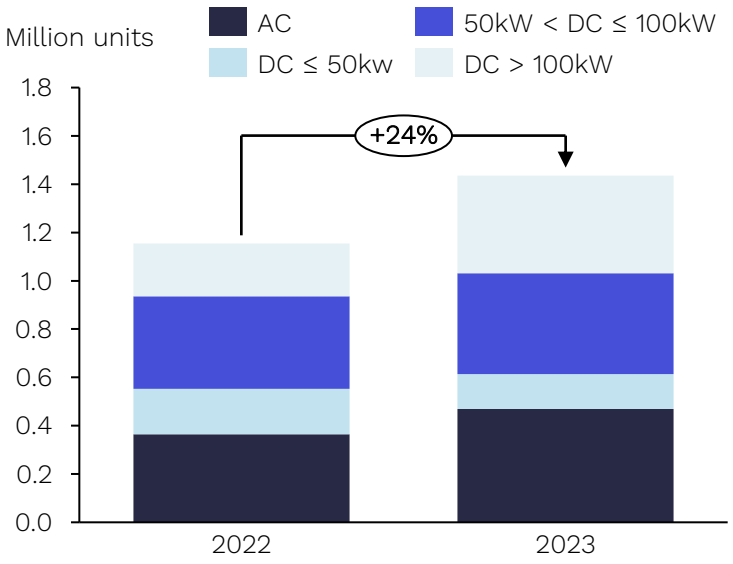


North America PC & LDV average BEV charging speed

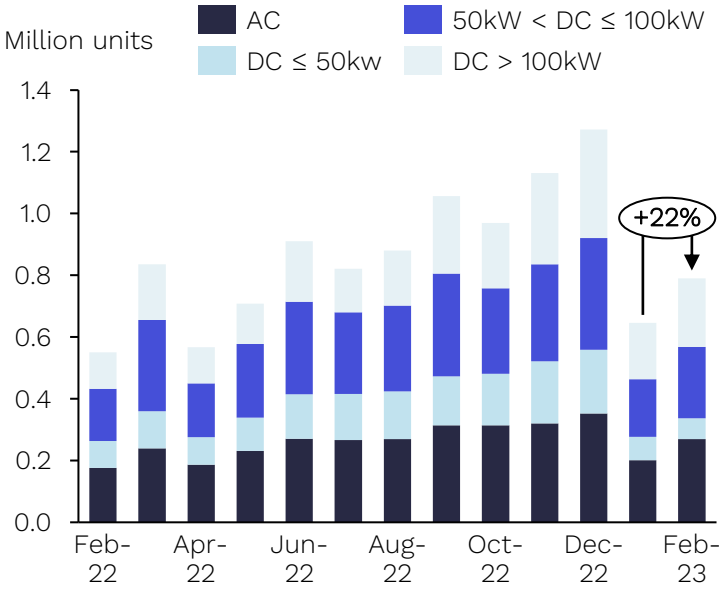


- Overall BEV & PHEV sales increased in February to 800,000 units, a m-o-m increase of 23%. Showing a recovery from a slow month in January, a result of the Chinese New Year and removal of some EV subsidies. This increase was mainly led by China, where sales increased by 100,000 units of PC & LDV, from last months figures. PC & LDV sales in Asia Pacific doubled since January, the highest monthly sales since September 2022.
- February was also a strong month for bus and coach sales with just under 10,000 units sold, a y-o-y increase of over 400%.

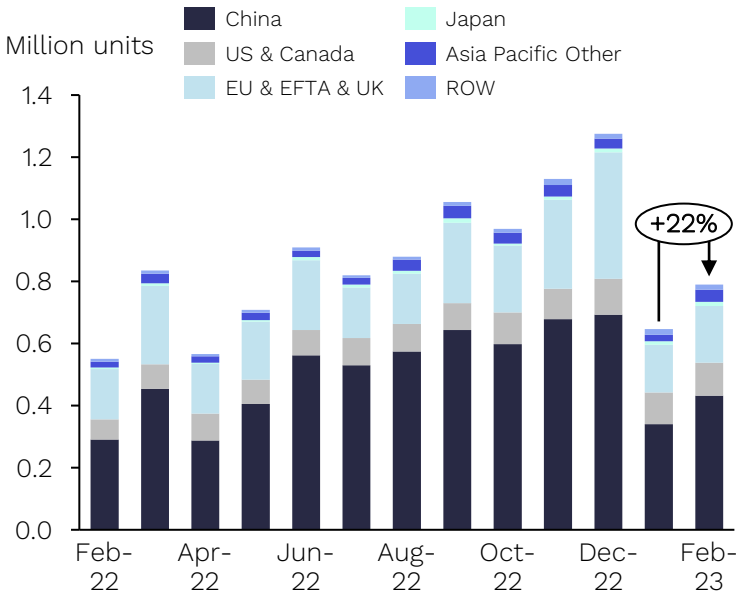
Global Year-to-date PC & LDV EV sales



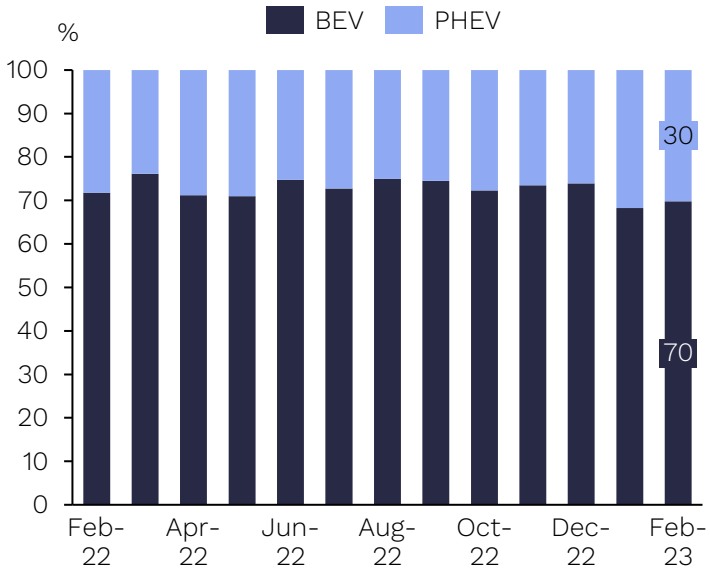
Global Monthly PC & LDV EV Sales by max charging capability



Global Monthly PC & LDV EV sales by region



Global PC & LDV BEV/PHEV market share



Global market share summary by charging capability, year-to-date

EV charging capability	YTD Sales '000	(% of total)	Fleet '000	(% of total)
AC	469	33%	8,418	32%
DC ≤ 50kw	144	10%	3,975	15%
50kW < DC ≤100kW	418	29%	9,981	37%
DC > 100kW	404	28%	4,436	16%
Total	**1,436**		**26,719**	

Assessment Methodology

Rho Motion's *Electric Vehicle Charging Assessment* provides an analysis of the maximum charging capacity of global and regional passenger car and light duty vehicle sales and fleets, as well as a fleet energy demand considering energy consumption per 100km and annual vehicle kms driven.

Electric vehicle sales data is collected on a model-by-model basis from automotive associations, OEMs and data providers at country level for both BEV and PHEV vehicles for major markets. This analysis covers a minimum of 90% of total global market sales and provides a balanced representation of markets with different vehicle characteristics, suppliers and seasonality.

Where EV specific model data is not explicitly stated estimates are used based on industry and company reports and primary research. These are then corroborated or adjusted when official data becomes available. For each vehicle model we collect data relating to maximum AC and DC charging capability, plug type(s), battery pack size and battery chemistry in addition to a number of other vehicle metrics.

The data for the number of public charging stations for each region is collected from multiple sources including national associations, company financial reports, primary research and open-source data. Residential charging data is calculated based on vehicle sales and fleet, the split of BEV/PHEV and regional access to private parking and other demographic factors. Infrastructure data for at end of stated month.

Assessment Glossary

Vehicle: EV – Electric Vehicle, BEV – Battery Electric Vehicle, PHEV – Plug-in Hybrid Electric Vehicle, PC-passenger car, LDV – Light Duty Vehicle, MD – Medium Duty, HD – Heavy Duty, CV – Commercial Vehicle

Charging: AC – Alternate Current, DC ≤50kw – Direct Current up to and including 50kW, 50kW < DC ≤100kW – Direct Current greater than 50kW and up to and including 100kW, DC > 100kW – Direct Current over 100kW.

See here for our disclaimer and sources