

## Summary

# Executive summary

Electric vehicle (EV) charging refers to the process of charging a battery electric vehicle or plug-in hybrid electric vehicle from an external power source. The external power source is often a charging station, which is defined as equipment enabling a connection between the electric vehicle and the power grid. EV charging stations are today playing a significant role in the discussions regarding the electrification of vehicle fleets. Electric vehicles and EV charging stations are often brought forward as a prerequisite in order to decrease the environmental impact of transportation.

Berg Insight is of the opinion that the market for EV charging solutions is in a growth phase which will last for several years to come. Mega-challenges such as vehicle emissions and climate change continue to encourage investments in electric vehicles and EV charging infrastructure, contributing to a positive outlook for the market. The COVID-19 crisis is expected to generate some temporary short-term fluctuations, but Berg Insight remains positive that the long-term growth should not be affected. The total number of dedicated charging points in Europe is forecasted to grow at a compound annual growth rate (CAGR) of 31.1 percent from 1.3 million in 2019 to 5.2 million by 2024. In North America, Berg Insight estimates that the total number of dedicated charging points will increase from 0.7 million in 2019 to reach 2.4 million in 2024, growing at a CAGR of 26.7 percent. These numbers include both private and public charging points.

Over the years, charging stations have evolved from being traditional non-connected hardware devices to smart devices using connectivity technologies such as Wi-Fi, GPRS and 4G. Charge point operators (CPOs) can remotely monitor and maintain charging stations, while EV drivers via smartphones can locate chargers, monitor charging availability and manage payments. In 2019, the number of connected charging points in Europe is estimated to have reached 0.6 million units, corresponding to a penetration rate of 46 percent. In North America, the number of connected charging points is estimated to about 0.3 million, corresponding to a penetration rate of 35 percent. Most of the connected charging points in Europe and North America are either in public or semi-public applications.

A group of aftermarket solution providers have emerged as leaders on the market for EV charging stations. In Europe, examples of major hardware providers include ABB, ABL, Alfen, Circontrol, Compleo Charging Solutions, CTEK, DBT Group, Efacec, EVBox, Garo, IES Synergy, Keba, Mennekes, Pod Point, Rolec Services, Schneider Electric, Wallbox and Zaptec. Some of these companies specialise in either AC or DC chargers, while some offer both. A few players also offer software and services as part of end-to-end offerings. Many charge point operators develop backoffice platforms in-house, but some rely on third-party platforms from dedicated software providers. Examples of significant software providers in Europe are Virta, Has-to-be, Greenflux, Last Mile Solutions, Driivz and Fortum. In North America, there are a number of regional as well as international companies offering hardware and software solutions. ChargePoint is a clear leader on the market, while other examples of regional providers include BTCPower (Innogy), Blink Charging, SemaConnect and AddEnergie. ChargePoint, Blink Charging, SemaConnect and AddEnergie can all provide end-to-end offerings, including hardware and network services. The most prominent dedicated software providers in North America are Greenlots (Shell Group) and EV Connect.

There are a large number of charge point operators (CPOs) in Europe. A few of these players have charging operations as their core business, but many actors come from adjacent markets. Examples of companies that are more or less specialised CPOs include Ionity, Allego, Freshmile, InstaVolt and Fastned. The former was founded in 2017 by BMW Group, Ford Motor Company, Daimler and Volkswagen Group. Many of the CPOs in Europe are utility companies. Examples of utilities acting as CPOs are CEZ Group, EnBW, Enel X, ESB Group, Iberdrola Group, Innogy, Izivia, Statkraft and Vattenfall. The French CPO Izivia is a subsidiary of the French utility EDF, while Enel X is a subsidiary of the Italian utility Enel. The latter is furthermore also a notable hardware provider in North America after acquiring eMotorWerks in 2017. Some CPOs in Europe have a background in the petroleum industry. NewMotion and BP Chargemaster are owned by Shell Group and British Petroleum respectively. French Total in addition has a charging operation business. BP Chargemaster, NewMotion and Total can also provide hardware, and this is similarly the case for the utilities Enel X and Innogy. In North America, Electrify America and EVgo are two major CPOs. Tesla is also a prominent player, operating its Supercharger and Destination Charging Networks in Europe and North America.