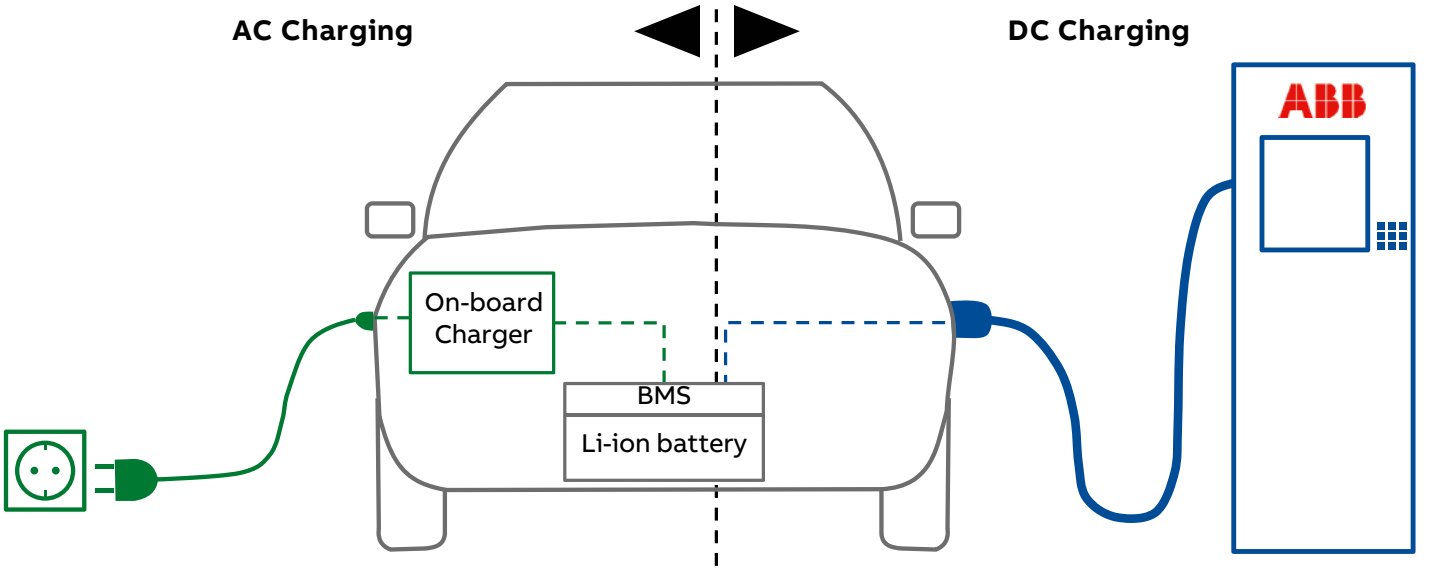
Electric vehicle fast charging

A practical overview of the most frequently asked questions

What is the difference between AC and DC charging?
An AC charger supplies AC (Alternating Current) to an onboard charging device that then charges the EV battery. Faster charging is accomplished with DC (Direct Current). A DC fast charging station supplies power directly to the battery management system inside the vehicle with no onboard charging infrastructure needed inside the vehicle.

AC charging versus DC charging

On-board versus Off-board equipment



Every vehicle needs to have its own onboard equipment

Infrastructure investment is shared with hundreds of users

What kind of cars stand these abbreviations for: PEV, BEV, PHEV?
All vehicles with a battery that can be recharged from an external source of electricity are considered PEVs, or plug-in vehicles.

BEV stands for Battery Electric Vehicle, or a fully electric vehicle powered by an electric motor with no gas engine.

A PHEV, or plug-in hybrid electric vehicle, has both a plug-in electric system and a gasoline engine as backup to power the car.

How fast do EV's charge?

	AC wallbox	DC wallbox	DC Fast	DC High Power
				
	3–22 kW	20–25 kW	50 kW	150–350 kW
	4–16 hours	1–3 hours	20–90 min	8–20 min

Further influencers on the charge speed

Battery pack capacity
Larger battery packs can be charged faster

State of charge
Charge speed can drop to prevent the battery cells from overheating

Battery temperature
Heating or cooling systems keep the temperature constant

Battery chemistry
Higher perfomance causes cost and additional weight

What are the fast-charging standards currently being used by electric car manufacturers?
ABB follows the fast charging standards:

- 50 kW CHAdeMO – Global
- 22–43 kW AC – Global
- 50–350 kW CCS2 – EU, US, South Korea, Australia
- Tesla - proprietary - CHAdeMO adapter
- GB/T - China

Fast charging is paramount in making electric vehicles a success. Fast charging makes electric cars more useful because of the reassurance drivers get knowing they can quickly recharge,it eliminates range anxiety. It seems that car owners with fast-charge capable cars, with enough fast charging stations around them, feel capable of taking longer trips.

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