



ABB E-Mobility Solution for E-bus charging

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ABB E-mobility

A world leader in EV charging solutions


2023
~1400 employees
~400 R&D engineers

2010
~45 employees



958 000 MWh
Total Energy Delivered

3 270 000 Tonnes
CO₂ Emissions Avoided



1 million+
AC chargers sold, including
via Chargedot



100 million+
charging sessions
enabled



50,000+
DC chargers sold



14
Acquisitions and investments
in the e-mobility sector*



*since 2010



1. Based on ABB management assessment; Roland Berger conducted revenue, footprint and product breadth analysis
2. Asia, Middle East, Africa

ABB E-mobility global footprint

Expanding our reach to better serve our customers

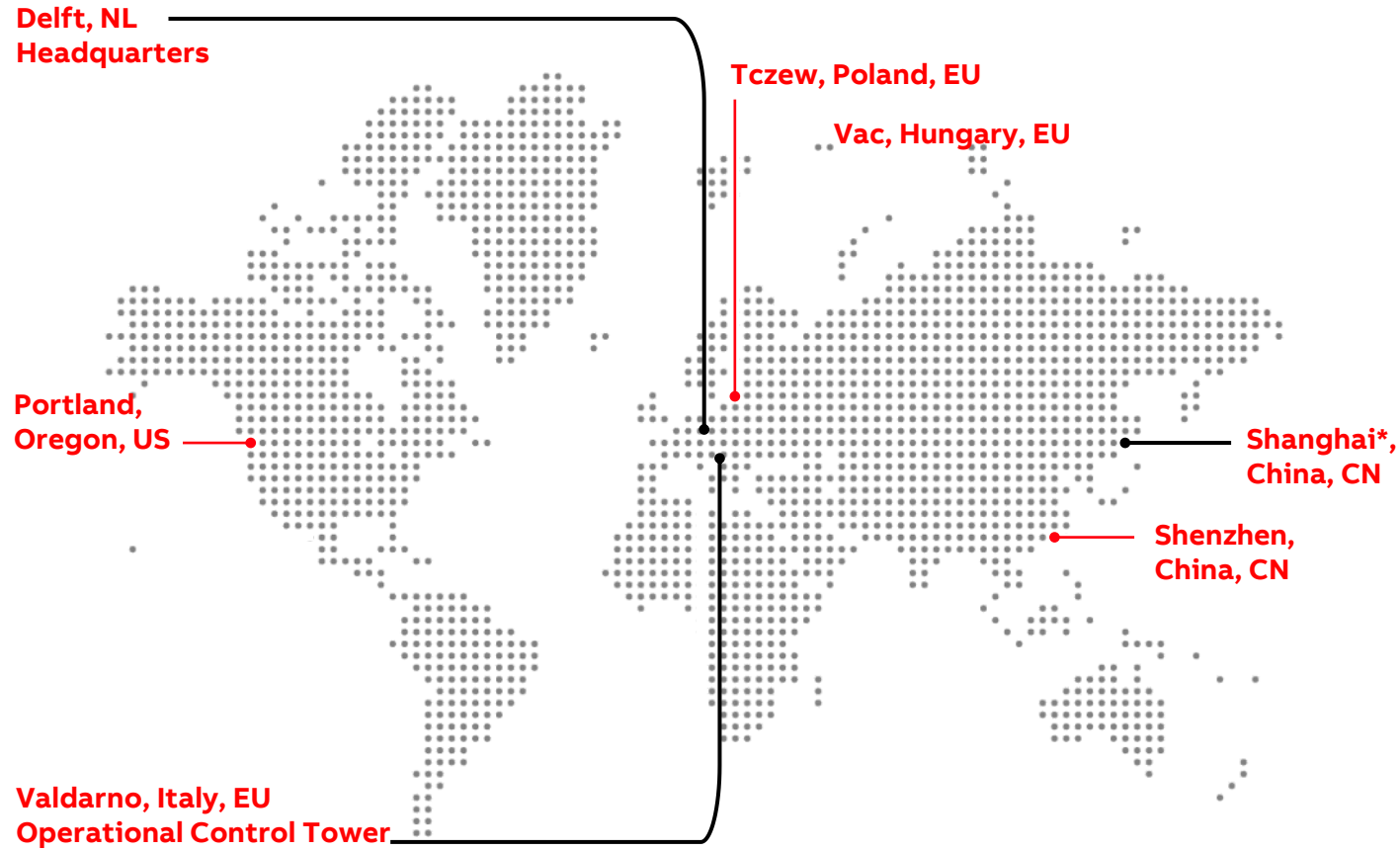


ABB is global charging partner for Car, Bus and Truck OEMs

Strong presence in Europe, USA and China

The image features a world map with ABB logos and partner information for various OEMs. The information is organized as follows:

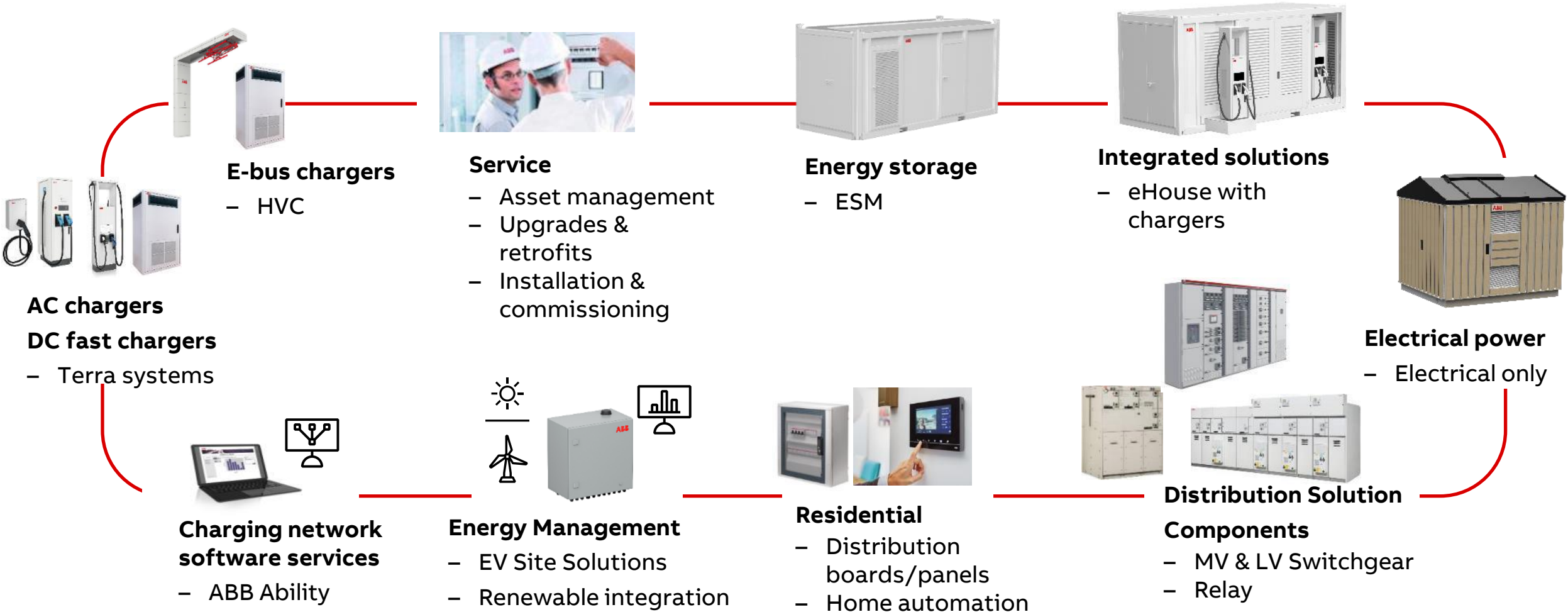
- Volvo:** - R&D partners
- BMW:** - R&D partners
DC fast chargers at dealers
- VW:** - R&D partners
DC fast chargers at dealers
- Ferrari:** - R&D partners
- DC Wallbox
- Formula E
- Audi:** - R&D partners
- Swiss market activation
- Jaguar:** - R&D partners
- Suzuki:** - AC&DC fast chargers at dealers
- Kia:** - DC fast chargers at dealers
- Volvo (Bus):** - Global partnership
R&D partners
- MAN (Bus):** - Bus
- R&D partners
- MAN (Truck):** - Truck
- R&D & joint project
- Scania:** - R&D partners
- HeuliezBus:** - Cooperation
- R&D partners
- Toyota:** - R&D partners
AC&DC fast chargers at dealers
- Lexus:** - R&D partners
- Ford:** - DC charging testing & R&D
- NovaBus:** - Partnership
- R&D partners
- New Flyer:** - Cooperation
- R&D partners
- Motor Coach Industries:** - R&D partners
- tm4:** - Joint projects
- Cummins:** - Cooperation
- R&D partners
- Hess:** - Cooperation
- R&D partners
- Honda:** - R&D partners
- GM:** - DC charging testing & R&D
- Dong Feng:** - R&D partners
- DC fast chargers at dealers
- Cooperation Dong-Feng
- Changan:** - R&D partners
- SAIC Motor:** - R&D partners
- BYD:** - R&D partners
DC wall box for Denza EV
- Daimler:** - R&D partners
- Renault:** - R&D partners
- BAIC Group:** - R&D partners

Preferred infrastructure supplier to the largest charging networks

A trusted partner in the evolution of transport

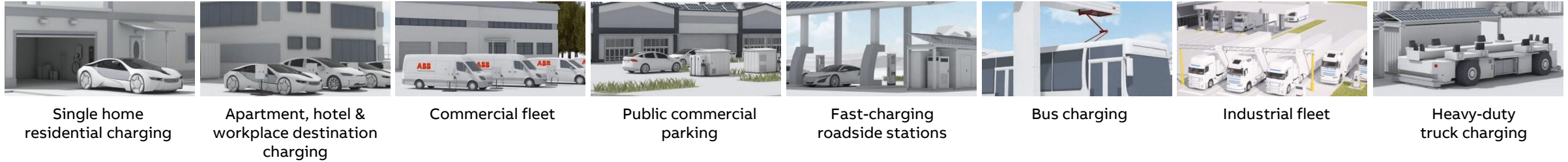


One stop shop for EV infrastructure solutions

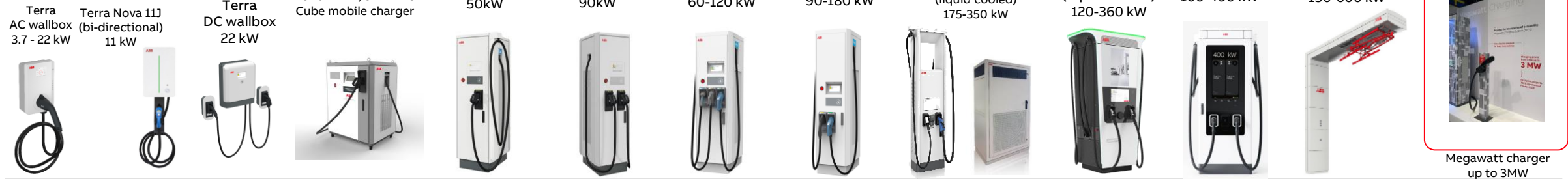


Widest portfolio of EV charging solutions for customers across various use cases

Use case



Charging products

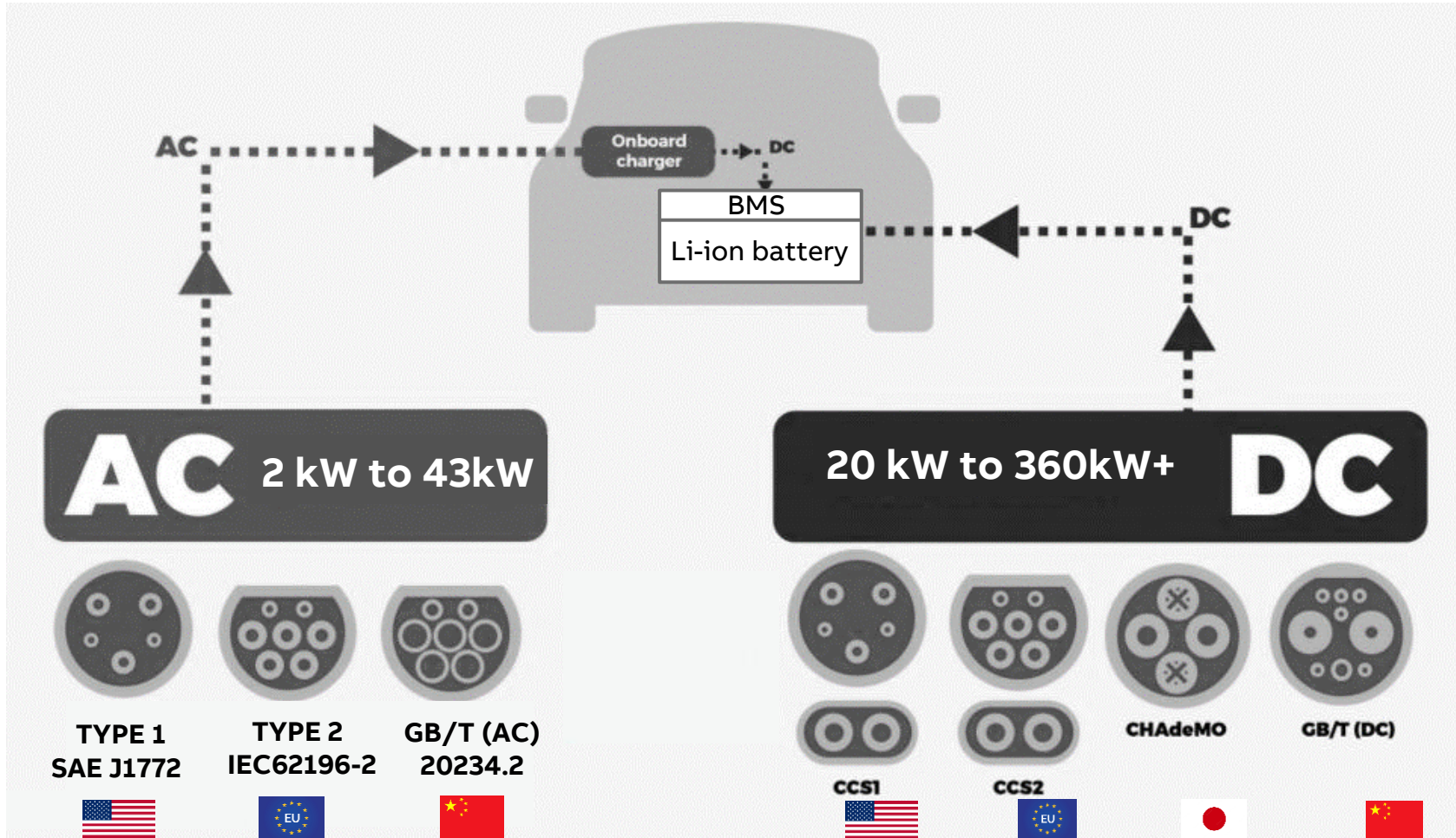


Asset, energy & fleet management



AC charging versus DC charging

On-board versus Off-board equipment



Complete e-mobility solution for high power large bus depot

With vertically integrated and connected solution from grid to charging point

ABB delivered complete depot electrification and charging solution



Digitalization

**Low and medium
voltage power**

High power chargers

Value proposition and customer benefits



Complete solution from grid connection to charging point, including a pre-fabricated building



Increased uptime thanks to digital service support



213 million passengers transported each year



110 bus lines electrified



100% fleet electrification



Emissions-free operations

ABB eBus charging – Reference projects



UK

- Harrogate
- Birmingham
- Coventry
- Staines



Norway

- Trondheim
- Oslo
- Lillehammer
- Brakar



Sweden

- Varnamo
- Ostersund
- Gothenborg
- Skelleftea
- Uddevalla



Denmark

- Aarhus



Spain

- Zaragoza



Netherlands

- Dordrecht
- Leiden



Germany

- Hamburger Hochbahn
- Gottingen
- Rottweil



Belgium

- Namur
- Charleroi
- Leuven



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère du Développement durable
et des Infrastructures

Département de l'environnement



Austria

- CNL project

Switzerland

- Bern



Luxembourg, Lux



France

- Paris
- La Rochelle
- Mulhouse
- Valance
- Rorthais



Czech Republic

- Trutnov



Singapore

- LTA
- NTU Test track



Public and commercial EV charging – Use cases

Charging service should match charging application and demand

ABB EV charging experts can help identify the right solution for your charging operation

Public and commercial EV Charging

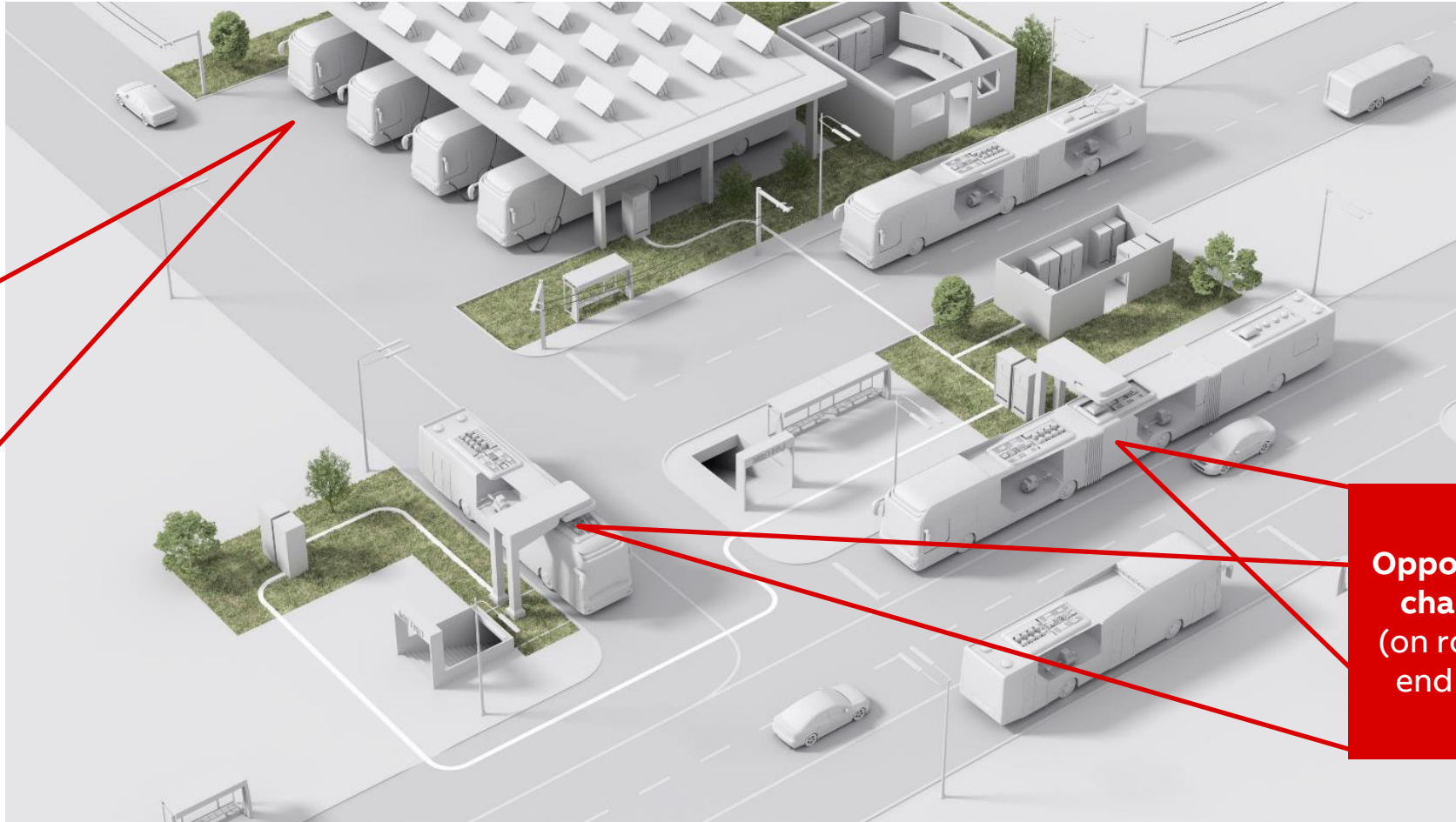
AC destination	DC destination	DC Fast (+ AC optionally)	DC High Power (+ AC optionally)
3.7 - 22 kW	22 kW	24-180 kW (+22/43kW)	180-360 kW (+22/43kW)



Electric bus charging applications

Overnight and opportunity charging

**Overnight charging
(at the depot)**



**Opportunity charging
(on route or end stop)**

Electric bus charging applications

Overnight and opportunity charging



Overnight charging

After operation most buses will go back to the depot. This offers an ideal moment to charge the bus overnight.

Average parking time is between 6-8 hours.

Depending on the battery capacity charging powers are between 30kW to 360kW.

Before start of operation most buses will require pre-conditioning to either heat up or cool down the interior.

Charging can be done 1 : 1 (1 charger per bus) or 1 : 3 (1 charger per 3 buses) combined with sequential charging.

Supported interfaces: Connector, Pantograph Up and Pantograph Down.

Electric bus charging applications

Overnight and opportunity charging



Opportunity charging

Charging during daily operation at any given stop or rest opportunity.

This offers an ideal solution to ensure zero-emission public transit during the day without impacting on the normal operation of the route.

Charge time typically is between 3 and 6 minutes and requires an automated connection device and high power charging.

Charging power is between 150kW to 600kW.

Supported interfaces

Pantograph Down and Pantograph Up.





Thanks for your attention!

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