



FEBRUARY 2021 / JOE ELLWOOD

EV charging considerations for Local Authorities



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ABB and EV charging

ABB's E-Mobility at a Glance



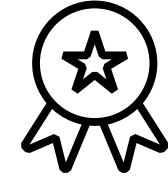
~ **800** employees
~ **250 R&D** engineers



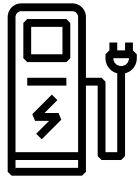
CAGR above
market average



**Double revenue to
next competitor**



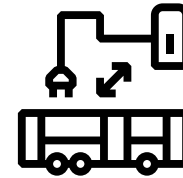
global **3 BUSD** market #1
market leader (excl. CN)



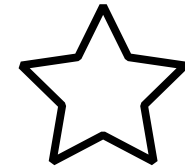
20,000+ DC chargers sold
in 85 countries



380,000+ AC chargers,
including via Chargedot



~ **42 million** charging sessions
enabled and ~ **470 GWh** power
delivered



invested in **5 start-ups** in
E-mobility space

ABB E-mobility solutions business

Continued commitment and investment

E-mobility Innovation Lab (Delft, NL)



November 2019

State-of-the-art R&D facility with 3 x car and 1 x bus/truck test bay

Focus:

- R&D for charging solutions
- Interoperability testing w/ OEM

 [Link to online story](#)

Chargedot (Shanghai & Pinghu, China)



March 2020

67% share acquired

Focus:

- China domestic market
- AC chargers

 [Link to online story](#)

New Manufacturing Site (Valdarno, Italy)



Q2 2021

State-of-the-art manufacturing facility

Focus:

- Scale up for DC fast chargers demand
- R&D test site for power testing

 [Link to online story](#)

EV fast charging and global standardization

ABB leading in major developments this decade

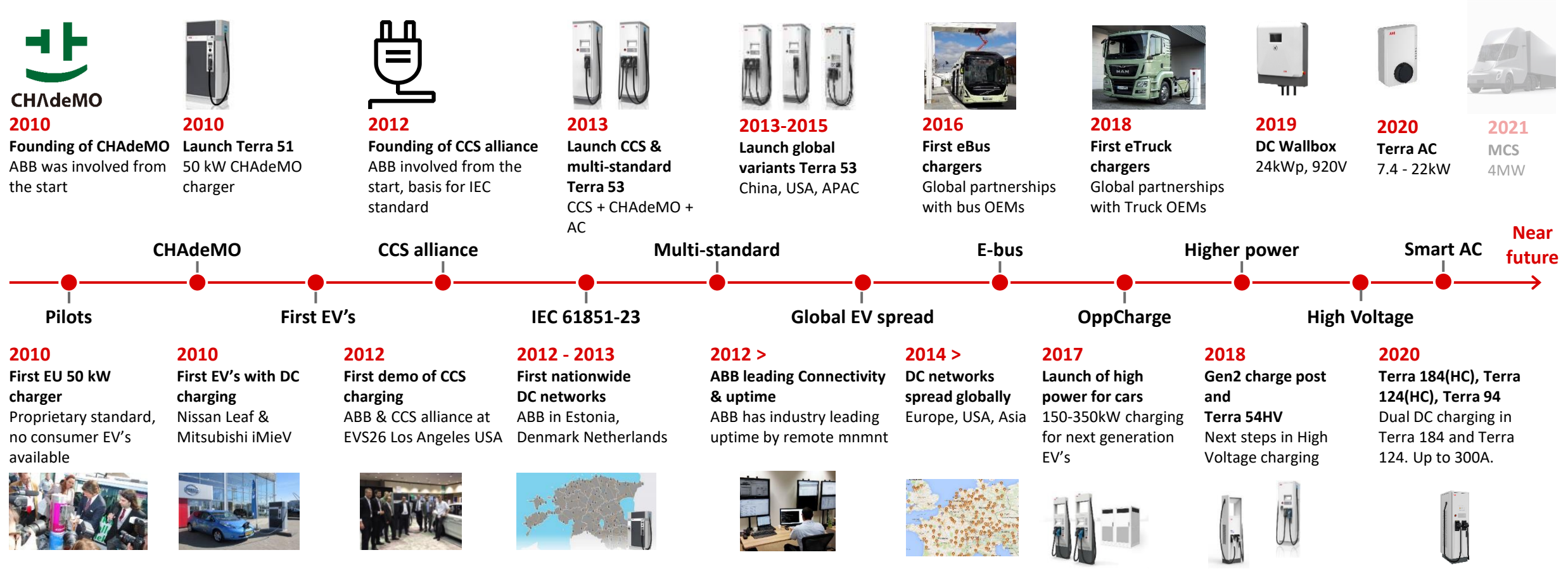
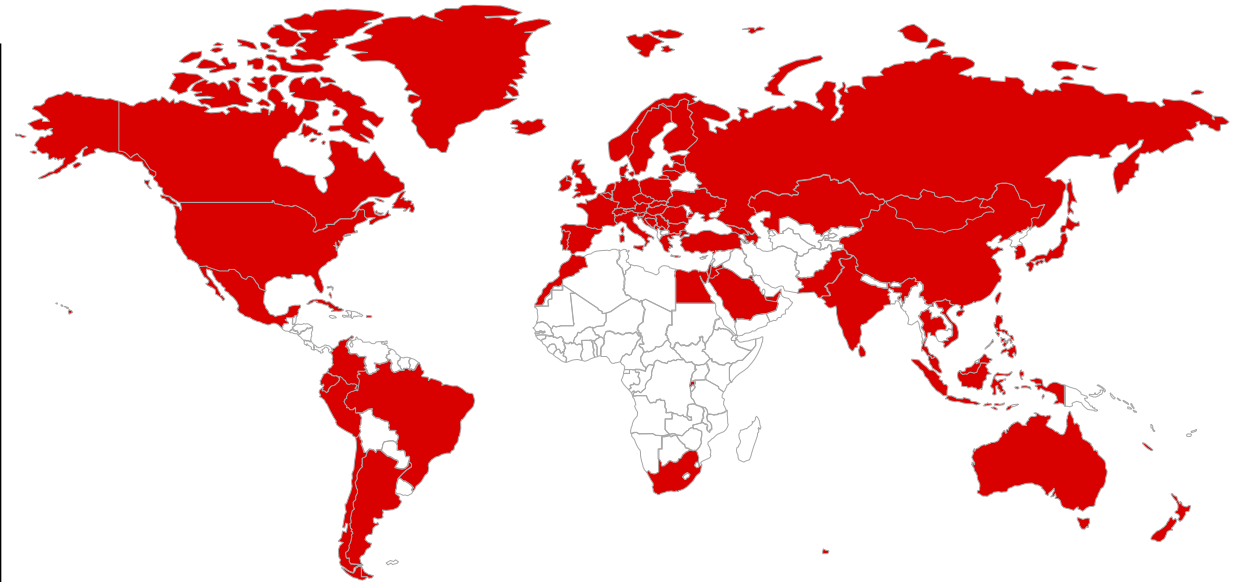


ABB DC fast charge installations

Proven technology in the field since May 2010, now in **82 countries**

Actual

Argentina, Australia, Austria, Azerbaijan, Bahamas, Belgium, Bosnia Herzegovina, Brazil, Bulgaria, Canada, China, Chile, Colombia, Croatia, Cuba, Czech, Denmark, Ecuador, Egypt, Estonia, Faroe Islands, Finland, France, Germany, Georgia, Greece, Greenland, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kosovo, Kuwait, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mexico, Monaco, Mongolia, Montenegro, Morocco, The Netherlands, New Zealand, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Reunion Island, Romania, Russia, Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, Ukraine, United Kingdom, USA, and Vietnam.



Total more than 17.000 pcs DC fast charging units sold (≥10 kW)

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

Strong presence in China, USA and Europe

VOLVO – R&D partners

BMW – R&D partners
DC fast chargers at dealers

VW – R&D partners
DC fast chargers at dealers

PORSCHE – R&D partners
– DC Wallbox
– Formula E

Audi – R&D partners
– Swiss market activation

JAGUAR – R&D partners

RENAULT – R&D partners

KIA – DC fast chargers at dealers

VOLVO – Global partnership
R&D partners

MAN – Bus
– R&D partners

MAN – Truck
– R&D & joint project

SCANIA – R&D partners

HEULIEZBUS – Cooperation
– R&D partners

TOYOTA – R&D partners

Ford – DC charging testing & R&D

NOVA BUS – Partnership
– R&D partners

NEW FLYER – Cooperation
– R&D partners

MOTOR COACH INDUSTRIES – R&D partners

tm4 – Joint projects

Cummins – Cooperation
– R&D partners

HESSE – 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

SAUBER Engineering – Charging partner

长安汽车 CHANGAN – R&D partners

北汽集团 BAIC Group – R&D partners

上汽集团 SAIC MOTOR – R&D partners

DAIMLER – R&D partners
DC wall box for Denza EV

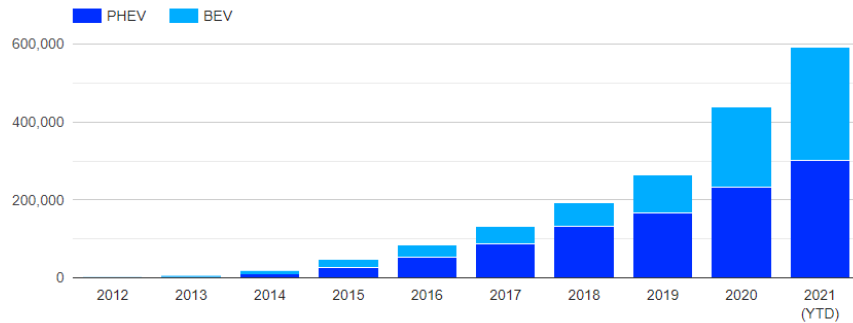
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UK outlook

E Mobility – Where are we now and where do we think this will go in the UK?

EV market and changes to building regs

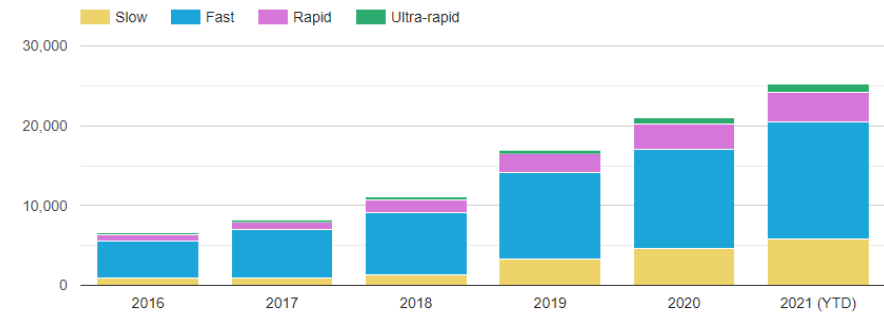
Cumulative number of plug-in vehicles registered in the UK (2012 to date)



Source: SMMT, OLEV, DfT Statistics. Updated: July 2021



Number of public charging points by speed (2016-to date)



Total devices: 25227, Updated: 20 August 2021



New residential buildings

- Chargepoint to be required in every building with off-street parking
- Multi-dwelling buildings with more than 10 spaces to include cable routes for all spaces

New non-residential

- Every new non-residential building and every non-residential building undergoing major renovation with more than 10 car parking spaces to have one chargepoint and cable routes for a charger for one in five spaces

Existing non-residential

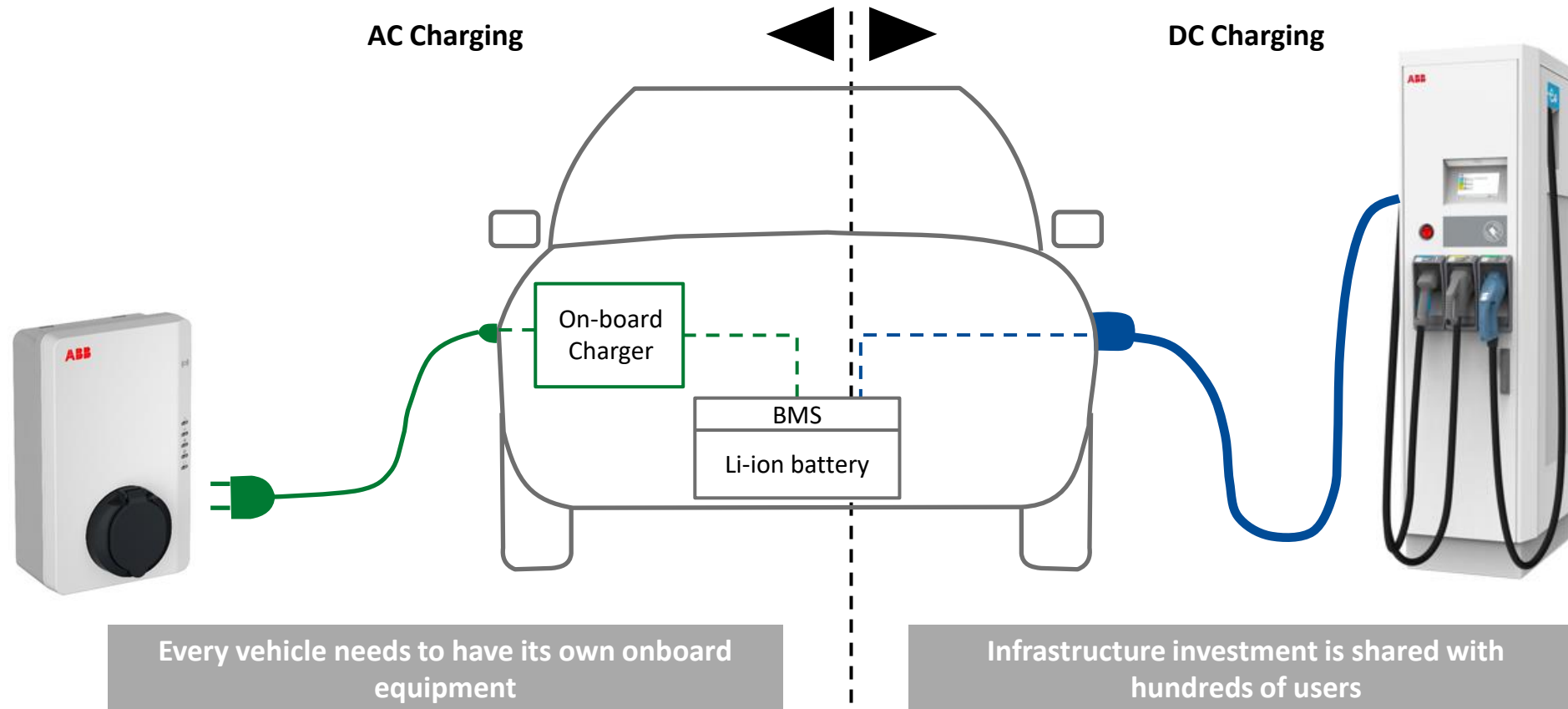
- At least one chargepoint in existing non-residential buildings with more than 20 car parking spaces (from 2025)

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DC versus AC charging





AC charging vs DC charging

On-board vs Off-board equipment







Public and commercial car charging – Use cases

Charging service should match charging application and demand

Public and commercial EV Charging			
AC destination	DC destination	DC Fast	DC High Power
7-22 kW	20-25 kW	50-150 kW	150 to 350 kW+
4-16 hours	1-3 hours	20-90 min	10-20 min
			
<ul style="list-style-type: none">– Office, workplace– Home– Multi family housing– Hotel and hospitality– Overnight fleet– Supplement at DC charging sites for PHEVs	<ul style="list-style-type: none">– Office, workplace– Hotel and hospitality– Parking structures– Dealerships– Urban fleets– Public or private campus– Sensitive grid applications	<ul style="list-style-type: none">– Retail, grocery, mall, big box, restaurant– High turnover parking– Convenience fueling stations– Highway truck stops and travel plazas– OEM R&D	<ul style="list-style-type: none">– Highway corridor travel– Metro ‘charge and go’– Highway rest stops– Petrol station area’s– City ring service stations– OEM R&D

Public and commercial car charging – Use cases

Charging service should match charging application and demand

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AC destination	DC destination	DC Fast	DC High Power
7-22 kW	20-25 kW	50-150 kW	150 to 350 kW+
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Connection to back-office & payment systems

Manage, monitor and connect to your business

Positioning connected services

Electric cars



DAIMLER



RENAULT

Charging infrastructure

CCS
CHAdeMO
GB
AC



Connected Services



ABB Ability™

Solutions to run a charger network



NTT DATA

GRIDPOINT



CGI

has-to-be
eMobility

chargecloud

pod POINT



MOBI.E
MOBILIDADE ELÉCTRICA

greenlots®

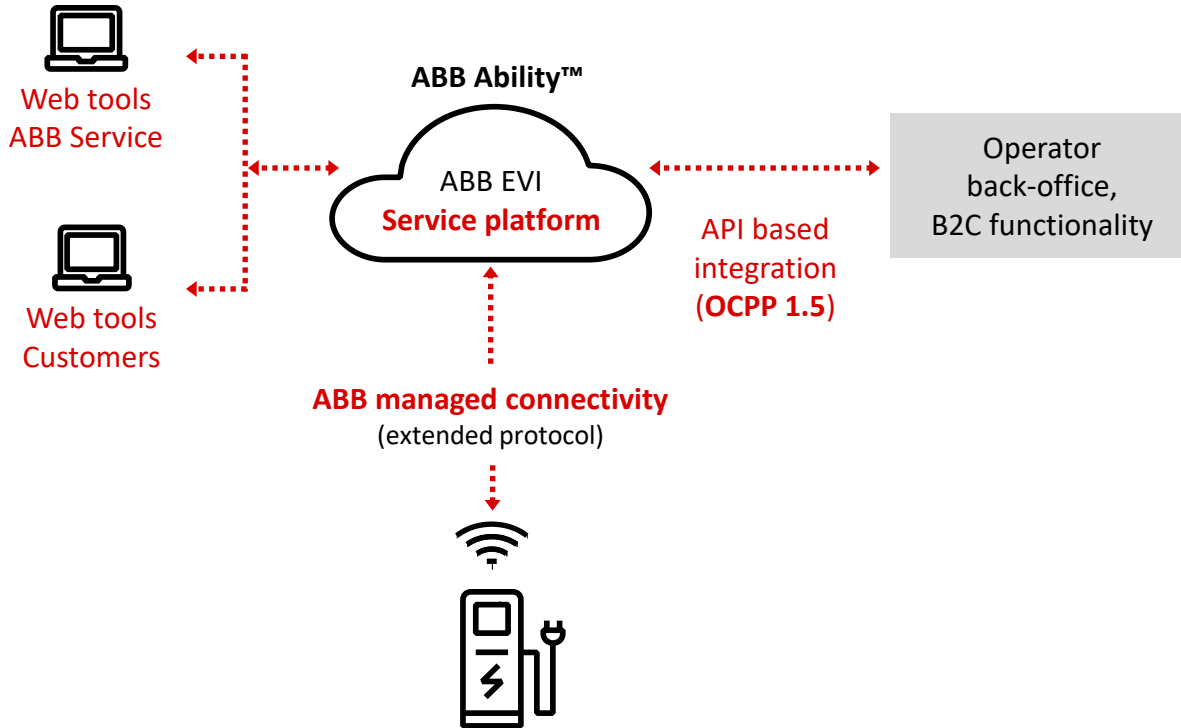


ABB does **not** have exclusive cooperation with any of the solutions

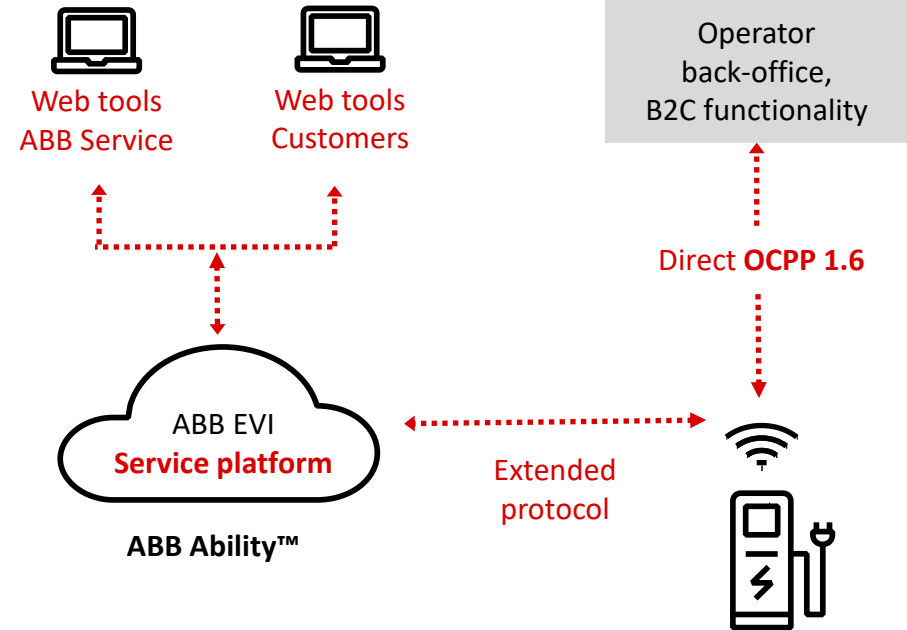
Digital integration of an ABB EV charger

OCPP 1.5 API compared to Direct OCPP 1.6

OCPP 1.5 API



Direct OCPP 1.6 via Dual Uplink





Local authority case studies

Northumberland County Council

Terra 53 / 54 – 24 units

- Early adopter of public EV charging
- ABB 50 kW units deployed around the county
- 149 public charger in total (Jan 2021)
- 46 chargers per 100,000 people compared with average of 31
- Until recently on free vend, but payment terminals recently activated to raise funds to expand network – 35 ppkWh

News

3rd March

Northumberland leading way on EV charging points



By Rebecca Curry | [@CourantRebeccaC](#)
Reporter



Sheffield City Council

Terra 54 – 24 units

- New network of 18 x 50 kW units for public use in 7 locations across Sheffield
- Additional chargers installed for exclusive use by taxi drivers
- 30p per kWh – contactless or app
- Overstay charges after one hour to encourage drivers to move their car for others to use



City of York Council

Terra High Power, Terra 54HV and Terra AC



- Live project at two existing park and ride sites



York's electric car charging 'hyperhubs' will be the largest in the North

Friday 19 February, 2021 by [Chloe Laversuch](#) - Local Democracy Reporter in Transport



Harrogate Bus Station (operated by Transdev)

3 x 300 kW pantograph bus chargers

- First “opportunity” bus chargers installed in UK
- Project in conjunction with Volvo buses
- Charging at bus station is enough for full recharge
- No other en-route or depot charging required

