



ING. MIROSLAV KUŽELKA

Dobíjecí infrastruktura druhé generace

Perspektivy e-mobility XI

ABB

ABB je partner pro Car, Bus and Truck OEMs



Rychlodobíjení a globální standardizace

ABB je technologický globální leader



CHAdeMO

2010

Founding of CHAdeMO
ABB was involved from the start



2010

Launch ABB Terra 51
50 kW CHAdeMO charger



2012

Founding of CCS alliance
ABB was involved from the start, basis for IEC standard



2013

Launch CCS & multi-standard Terra 53
CCS + CHAdeMO + AC



2013-2015

Launch global variants Terra 53
China, USA, APAC



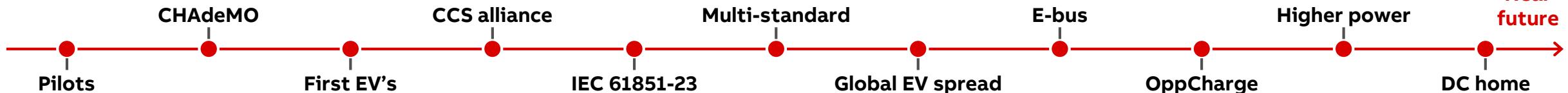
2016

First eBus chargers in EU
Global partnerships with bus OEMs



2018

First eTruck chargers
Global partnerships with OEMs



2010
First 50 kW charger in EU
Based on proprietary standard, no consumer EV's available



2010
First EV's with DC charging
Nissan Leaf & Mitsubishi iMiEV



2012
First demo of CCS charging
ABB & CCS alliance at EVS26 Los Angeles, USA



2012 - 2013
First nationwide DC networks
ABB in Estonia, Denmark, Netherlands



2012, >
ABB leading Connectivity & uptime
ABB has industry leading uptime by remote mnmt



2014 - >
DC networks spread globally
Europe, USA, Asia



2017
Launch of high power for cars
150-350kW fast charging for next generation EV's

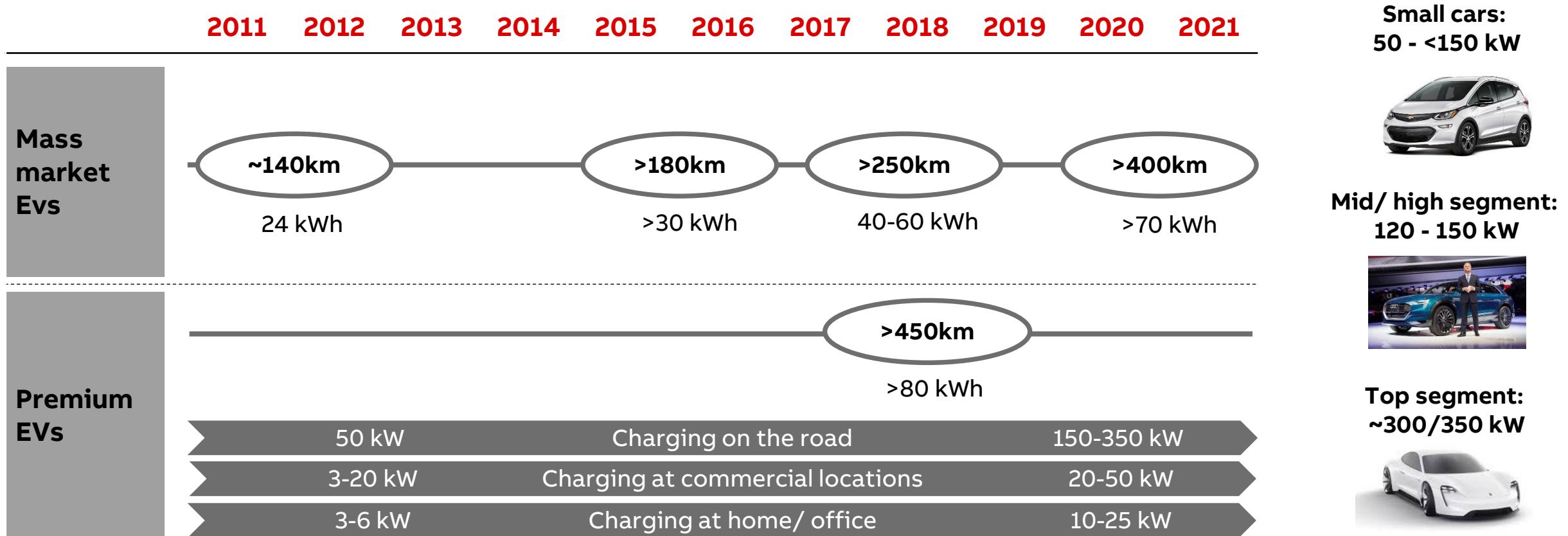


2018
Gen2 charge post and Terra 54HV
Next steps in High Voltage charging

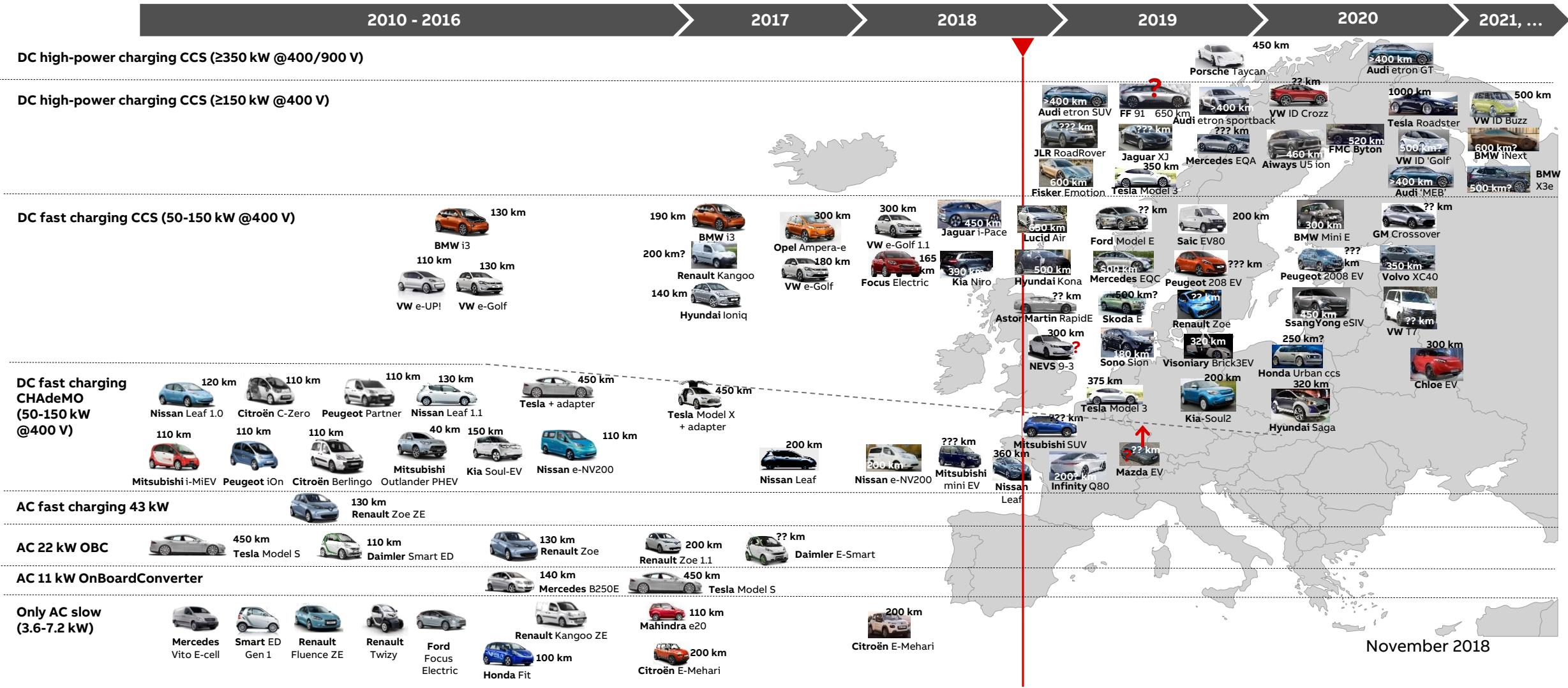


Dojezd, baterie, nabíjecí výkony

Trend : větší baterie a větší dojezd



Follow the car through Europe, and open standard protocols

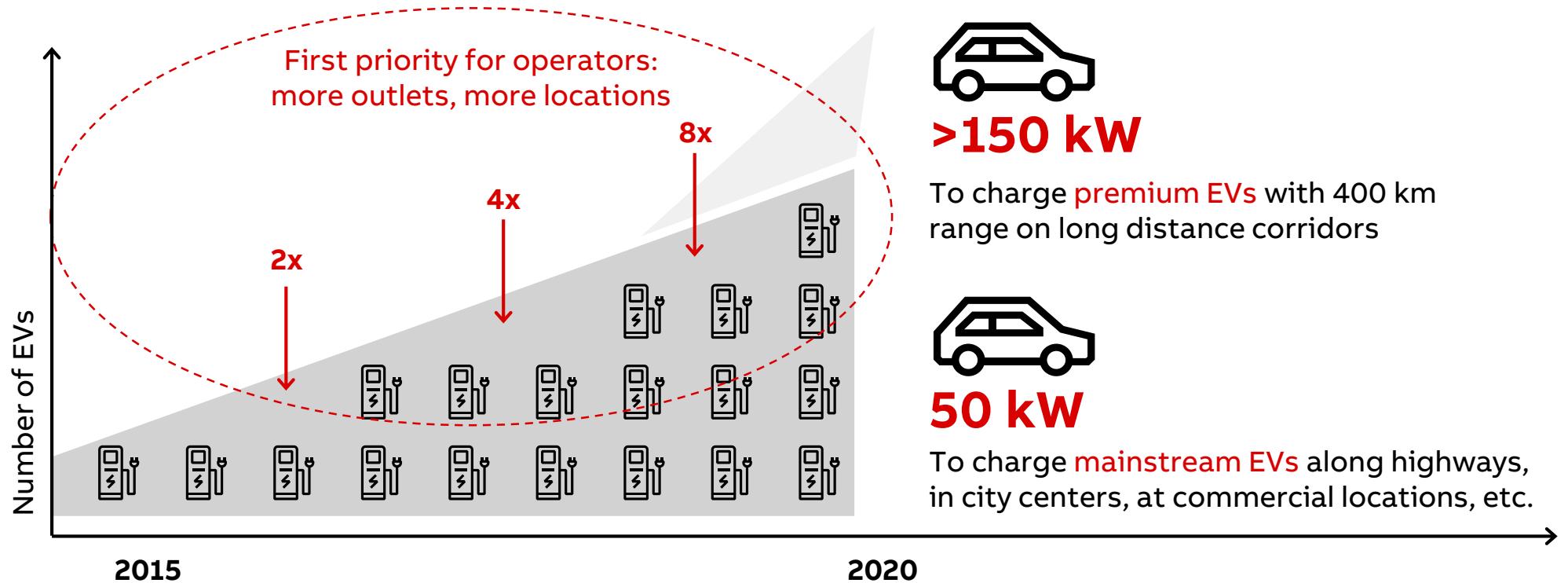
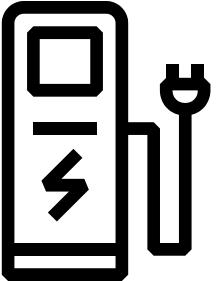


Očekávání v EU

2015

Global trend

The year to secure the **best locations** for your charging network



First priority for operators:
more outlets, more locations

8x

2x

4x

>150 kW

To charge **premium EVs** with 400 km range on long distance corridors



50 kW

To charge **mainstream EVs** along highways, in city centers, at commercial locations, etc.

2015

2020

V příštích 5 letech budou **50 kW stanice** stále mainstreamem doplněným o koridory vybavenými stanicemi o výkonu > 150kW

ABB a high power charging >150kW

Máme za sebou již 3 letou cestu



2015, start HPC program
Start development of 175-500 kW power platform Specs definition with OEMs



2016, Launch e-bus
Successful launch of e-bus HVC variant, small scale serial production



2016, OEM co-development
working with multiple OEMs on high power charging



2016, Start Cooled cable
Co-development with 3 suppliers



2016-now, OEM testing
Testing with multiple OEMs, with HPC units in their test labs



June 2018, Neuenkirch, CH
First public installation in Europe of 350 kW charger with liquid cooled cable



May 2018, Chicopee, MA
First public installation in USA of 350 kW charger with liquid cooled cable



Feb 2017, Freemont, CA
1st functional field installation 175-350 kW, NRTL certification



Feb 2017, field test
Trial installation of charge post with customers

Dobíjecí infrastruktura nové generace

High Power Charging 150-350 kW

375 A/ 500 A

High speed– short stay



10-20 minute use cases

- Long distance corridors
- Highway rest stops
- Petrol station area's
- City ring service stations

Regional fast charging 50 kW

125 A

More chargers per site – Longer stay



20-90 minute use cases

- Metropolitan locations
- Retail & food locations
- Shopping area's
- Supermarket locations
- Inner-city fast charging
- City ring service stations
- Fleet/ taxi solutions
- Solution for small EVs with <50 kW charging capability

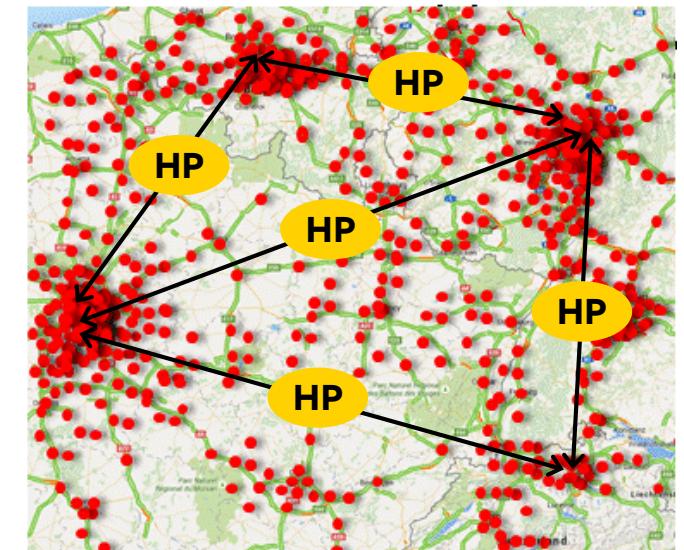


ABB High power charging 2018-2025

15 minute charging = 400 km driving

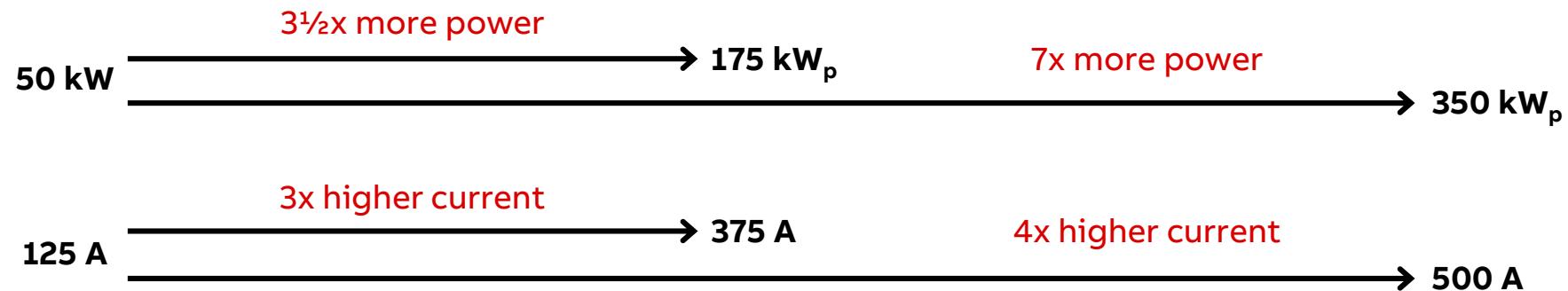
Terra 54



Terra HP – 1 cabinet



Terra HP – 2 cabinets



German Chancellor Angela Merkel and Mexican President Enrique Peña Nieto at Hanover Fair



Předávací stojan

Supporting brand identity



Top light

- White LED up-light illuminating the top styling element.

Programmable LED strips

- Vertical RGB LED strips on both sides of the front door.
- Colors can be set via the back-end to match customer branding.



Top styling element

- Top styling element can be removed and replaced in the field by own design or same design in a different color (by customer).

Předávací stojan



Efektivní a rozšiřitelný systém 175 kWp → 350 kWp

Static DC power cabinets

Start situation

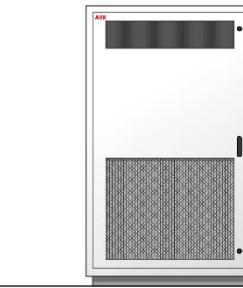
- Terra HP 175, static DC power cabinet

Upgrading from e.g. 175 kWp → 350 kWp

- Adding 1x Terra HP 175 static DC power cabinet

175 kWp

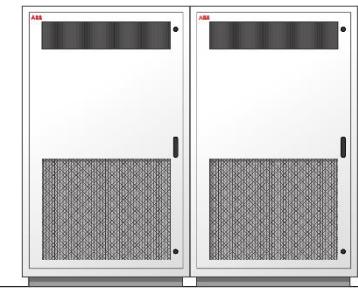
System with 1x Power Cabinet
and 1 Charge Post



Upgrade

350 kWp

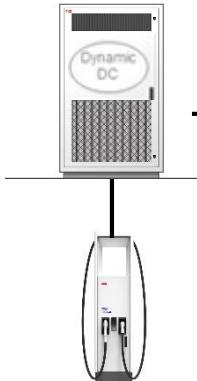
System with 2x Power Cabinet
and max. 1 Charge Post



Efektivní a rozšiřitelný systém

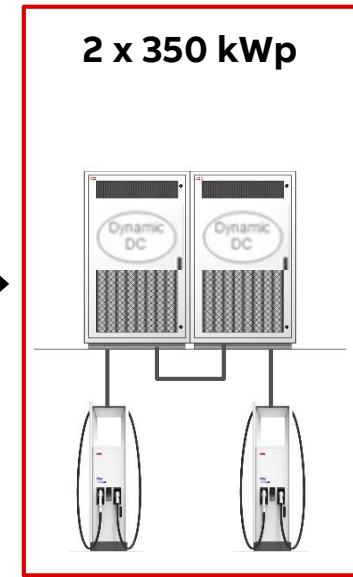
Dynamic DC power cabinets

175 kWp
Single system



Upgrade

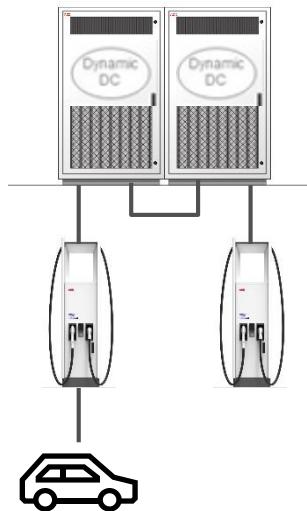
2 x 350 kWp



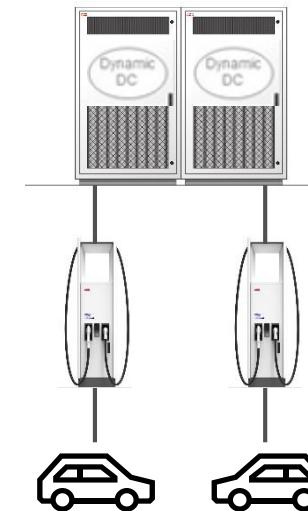
Dynamic DC

175 kWp for two normal cars simultaneously

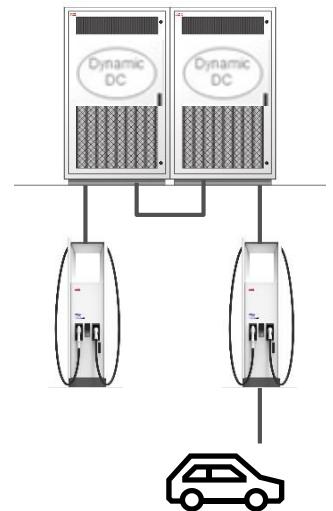
350 kWp available on each charge post for high-end cars



350 kWp
high-end car



175 kWp 175 kWp
normal cars



350 kWp
high-end car

Souběžné dobíjení více vozidel

Dynamic DC Manager: Performance with various cars

High-end battery car

- 800 V drivetrain, 350 kW charging



Medium battery car

- ~400 V drivetrain, 150 kW charging



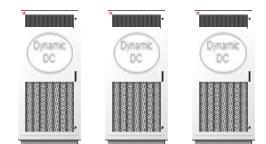
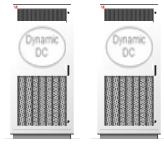
Small battery car

- 400 V drivetrain, 50-120 kW charging



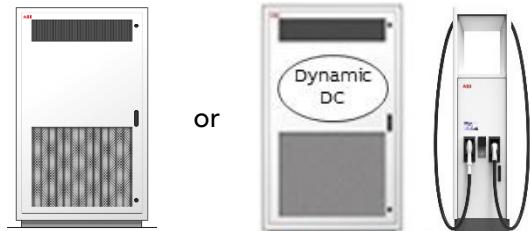
Output capability

- 1 cabinet: 175 kWp to 1 car
- 2 cabinets: 350 kWp to 1 car or 2 x 175 kWp to 2 cars simultaneously
- 3 cabinets: 350 kWp to 1 car and 175 kWp to a second car simultaneously
- When one car is ready power will be redistributed automatically



Souběžné dobíjení více vozidel

Dynamic DC Manager: Performance with various cars



or



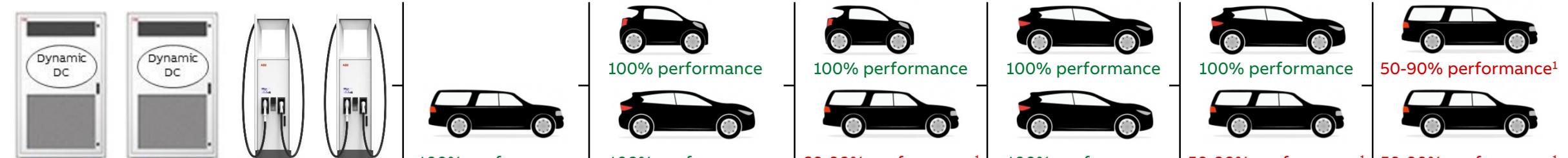
100% performance



100% performance



50-90% performance¹



100% performance



100% performance



100% performance



100% performance



50-90% performance¹



100% performance



100% performance



100% performance



100% performance



100% performance

100% performance

100% performance

100% performance

100% performance

50-90% performance¹

ABB je klíčovým dodavatelem pro IONITY a Electrify America

IONITY / ABB

IONITY will implement and operate a network of approximately 400 fast charging stations across 24 European countries by 2020. ABB has been selected as technology partner and supplier for Terra HP charging systems by IONITY.



ELAM /ABB

Over a 10-year period ending in 2027, Electrify America will invest \$2 billion in ZEV infrastructure, access, and education programs in the United States.

ABB has been selected to supply its Terra HP charging stations as part of the biggest electric vehicle infrastructure project to date in the United States.



IONITY

ABB is technology partner for the European High Power charging network

IONITY

- Joint Venture of leading automotive OEMs
- IONITY will implement and operate about 400 fast charging stations across European major thoroughfares until 2020
- Charging capacity of up to 350 kW
- Multi-brand compatibility through Combined Charging System (CCS-2)



Picture: Neuenkirch (A2), Switzerland: first IONITY site with ABB High Power chargers in operation.

Electrify America



ABB Terra HP high power EV charger can operate at powers of **up to 350 kW**



It can recharge the largest EV batteries in **less than 15 minutes**



Future-proof
architecture serves current and future BEVs through scalability and interoperability.



eBus Charging portfolio

3 hlavní způsoby dobíjení elektrobusů

ABB podporuje všechna standardizovaná řešení výrobců elektrobusů

CCS 2 connector



Pantograph Up (PU)



Pantograph Down (PD) - OppCharge



Produktové portfolio bus charging

CCS 2 connector



Pantograph Down (PD) - OppCharge

HVC 150P



HVC 300P



HVC 450P



HVC 600P



Pantograph Up (PU)

Terra 54 HV PU



HVC 150PU



HVC 300PU



HVC 450PU



HVC 600PU



3 hlavní způsoby dobíjení elektrobusů

ABB podporuje všechna standardizovaná řešení výrobců elektrobusů

Pilot project Arriva Trutnov

CCS 2 connector



Pantograph Up (PU)



Pantograph Down (PD) - OppCharge



Trutnov pilotní projekt 2019 : ABB HVC150C + 2 Charge boxes



ABB eBus charging - referenční projekty



Namur & Charleroi, BE
TEC
– 15 x HVC 150P



Trondheim, NO
Trondelag
– 8 x HVC 450P



Ostersund, SE
Nettbus
– 2 x HVC 300P



Gothenborg, SE
Volvo Busar
– 1 x HVC 150P
– 1 x HVC 300P
– 1 x HVC 150C
– R&D



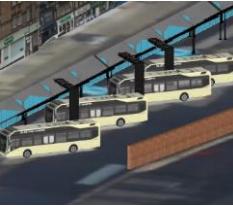
Luxembourg, Lux
Ville de Luxembourg
– 4 x HVC 150P
MDDI & Sales Lentz
– 4 x HVC 150P



Trutnov, CZ
Škoda
– 1 x HVC 150C
– 2 x Charge box
– R&D



Södertälje, SE
Scania Buses
– 1 x HVC 300P
– R&D test track



Harrogate, UK
Transdev
– 3 x HVC 300P



STL, Laval, Canada
1 x HVC 450P



La Rochelle, Fra
Transdev
– 3 x 150kW CCS2



Singapore
– NTU Test track
– 2 x HVC 300P



Munich, DE & AT
MAN Truck & Bus
– 7 x HVC 150C
– R&D



Kontaktní informace



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