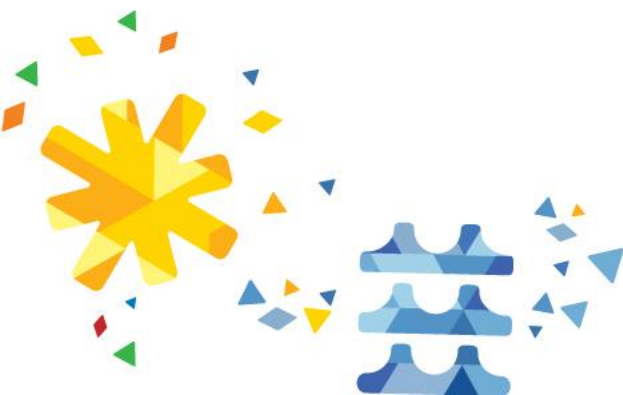




Eletricidade renovável inovação e tendências

CONFERÊNCIA APREN 2017

BEM VINDO
AO CÍRCULO DA MUDANÇA





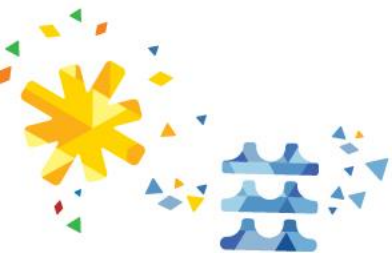
CARREGAMENTO DE VEÍCULOS
ELÉCTRICOS
TENDÊNCIAS ACTUAIS E DESAFIOS



FOR A
SUSTAINABLE
WORLD

ELECTRIC MOBILITY

CLEAN ENERGY SOLUTIONS FOR THE
MOBILITY MARKET





2009

MOBI.E -
Portuguese EV
charging
infrastructure pilot

2010

First public fast
charger in Europe

First non-Japanese
CHAdeMO

2011

Begin of
international
projects

2012

Certification
ZE Ready

2013

First CCS chargers
in the market

First multi-standard
charger

2014

Full range of
charging
products,
covering all
applications for
all cars





2015

Market introduction of QC24S and QCBUS

Since 2009, Efacec Electric Mobility has always been on the front of new developments in DC fast charging.

Today EEM runs several programs, shaping the future of EV charging.

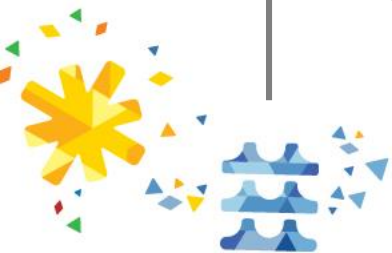




2016

Wireless Station
3,7 kW | 7,4 kW | 11 kW | 22 kW

EEM announced a partnership with Qualcomm Halo for the development of wireless charging solutions.



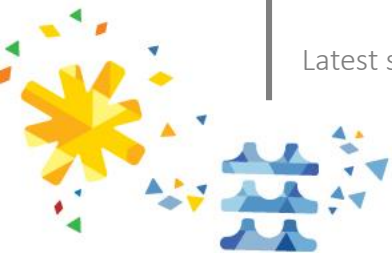


2016

Ultra Fast Charging Station
HV50 | HV175 | HV350

Latest solutions of High Power

Efacec was already awarded a number of pilots in high voltage / high power (920 V / 350 A) chargers for several installations for OEMs.





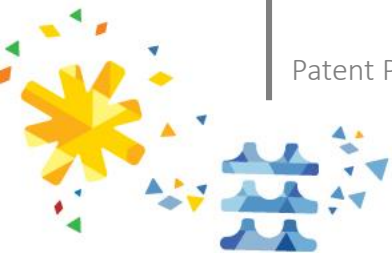
MILESTONES

2017

Integrated Battery Storage Station
QC45BATT

Patent Pending

Market launch of the first EV charger
with battery storage integration on
the market





PRIVATE



PUBLIC



QUICK



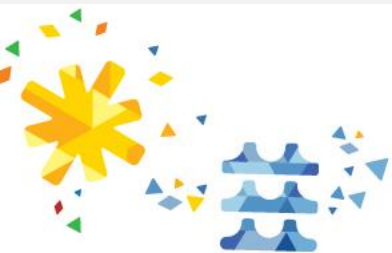
ULTRA FAST

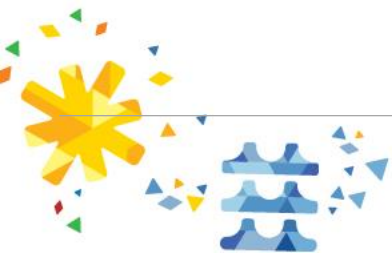
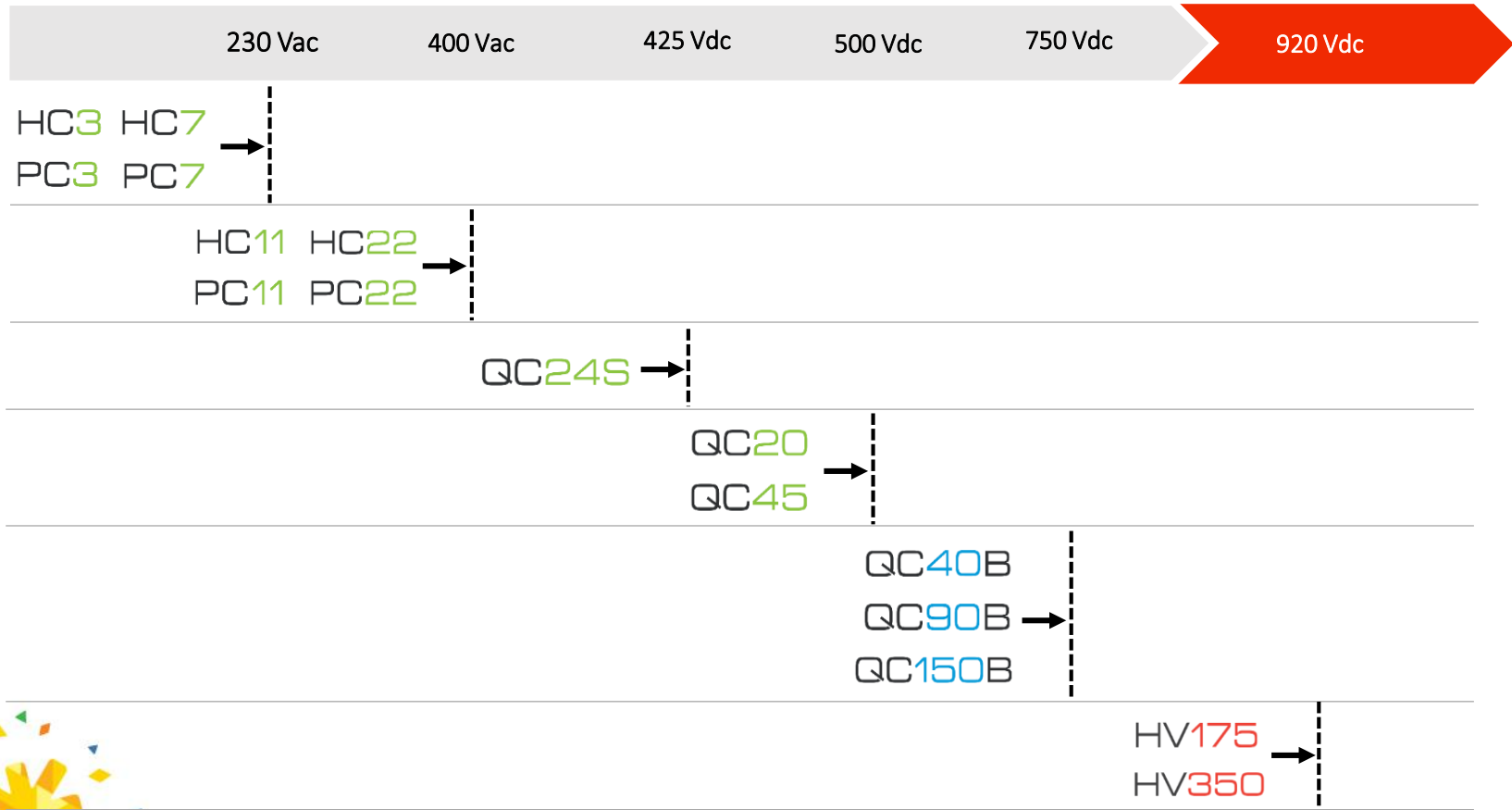


WIRELESS

PRODUCT PORTFOLIO

Makes electric vehicles part of people's life, offering a full range of charging solutions to charge electric cars, motorcycles and buses with integration in management systems for efficient use of electric grid infrastructure.

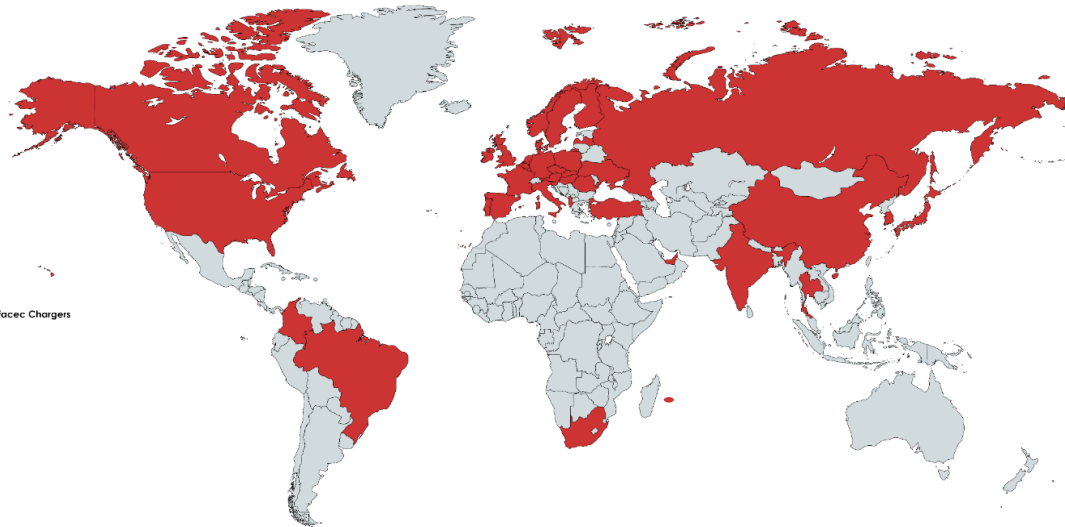






EV CHARGERS INSTALLED

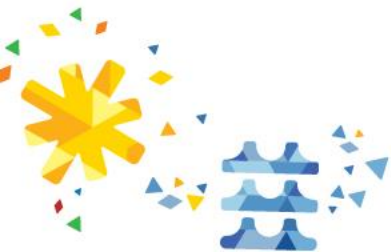
45 COUNTRIES

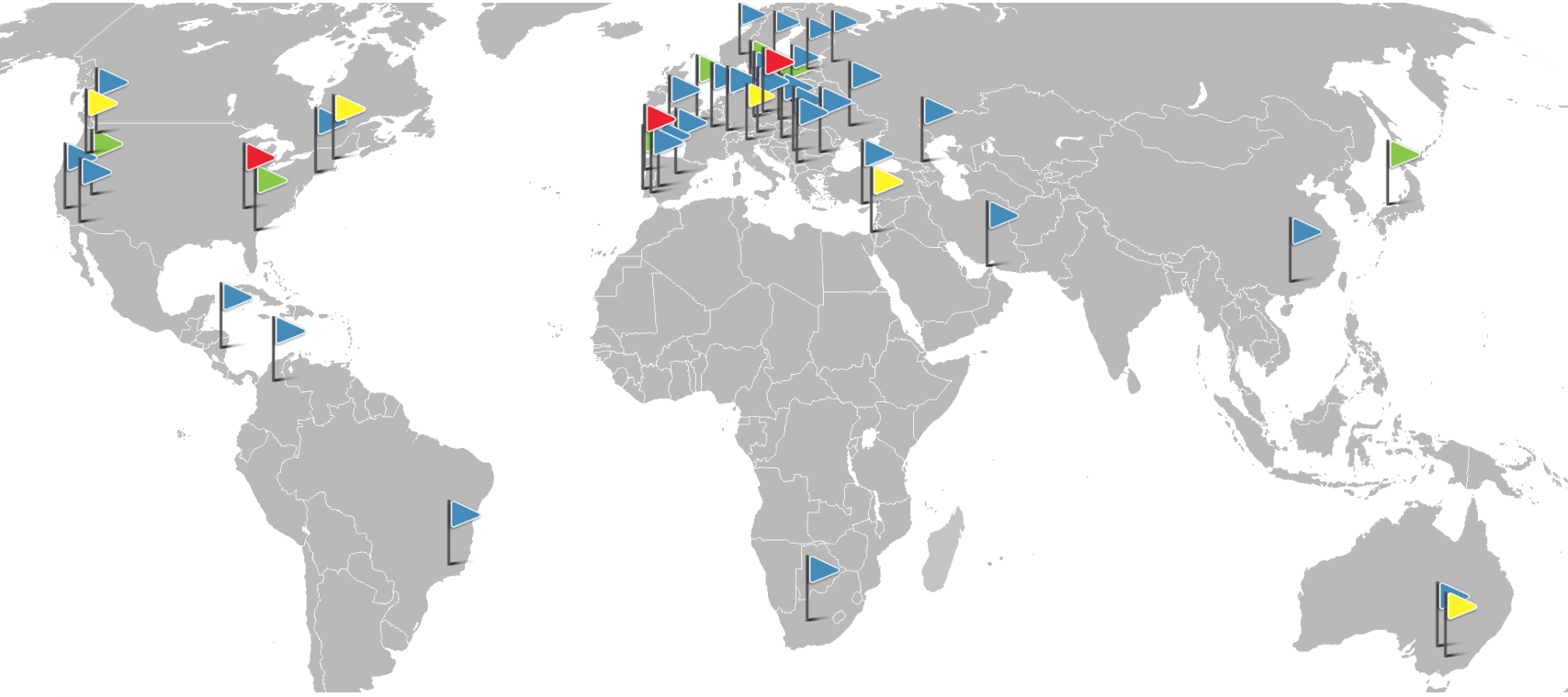


efacec Chargers



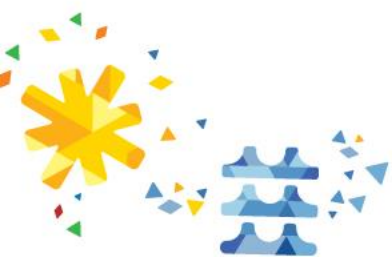
- Albania
- Aruba
- Austria
- Australia
- Belgium
- BeloRussia
- Brazil
- Canada
- China
- Colombia
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Georgia
- Hong Kong
- Hungary
- Iceland
- India
- Ireland
- Italy
- Japan
- Latvia
- Luxembourg
- Macao
- Mauritius Islands
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Russia
- Slovakia
- Slovenia
- South Africa
- South Korea
- Spain
- Sweden
- Thailand
- Turkey
- UAE
- Ukraine
- United Kingdom
- USA



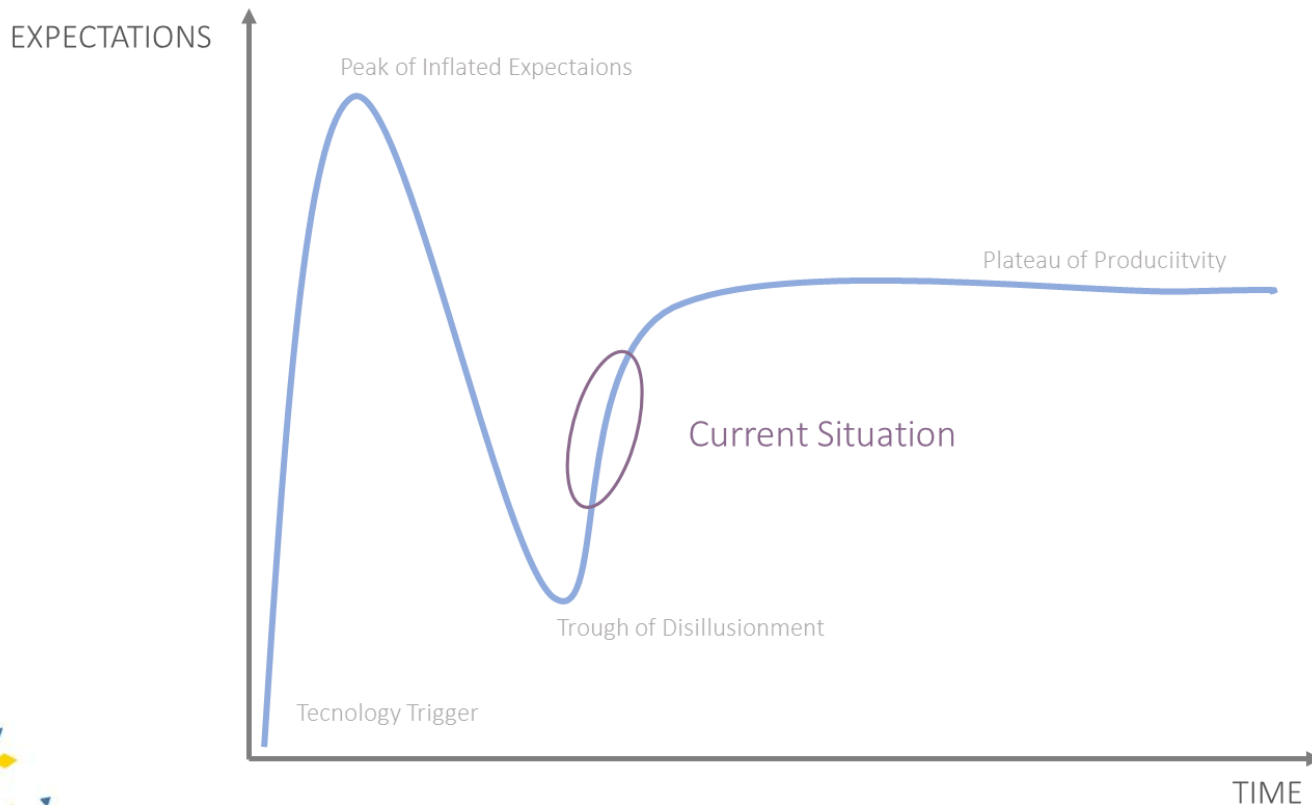


WORLDWIDE PRESENCE

- WHERE WE ARE
- MEMBERSHIP
- DISTRIBUTORS
- OTHER PARTNERS



Gartner Hype Cycle





Main lines of evolution in the EV charging for the next years

EV charging power increase

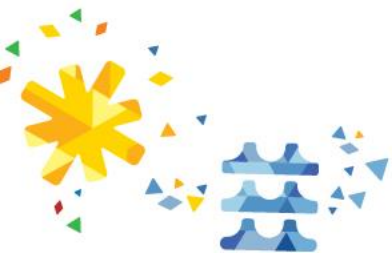
Management of the impact on the network by the increasing power required

Gradual implementation of new possibilities opened by IEC 15118

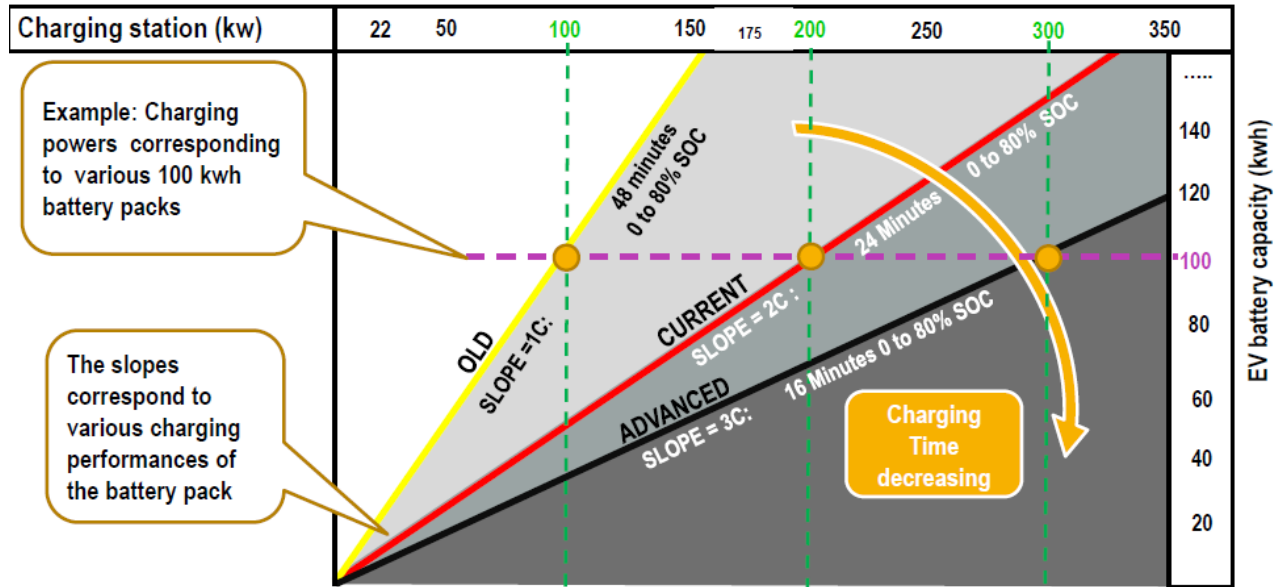
Wireless charging

What is the future of AC charging?

Bidirectional charging: V2X



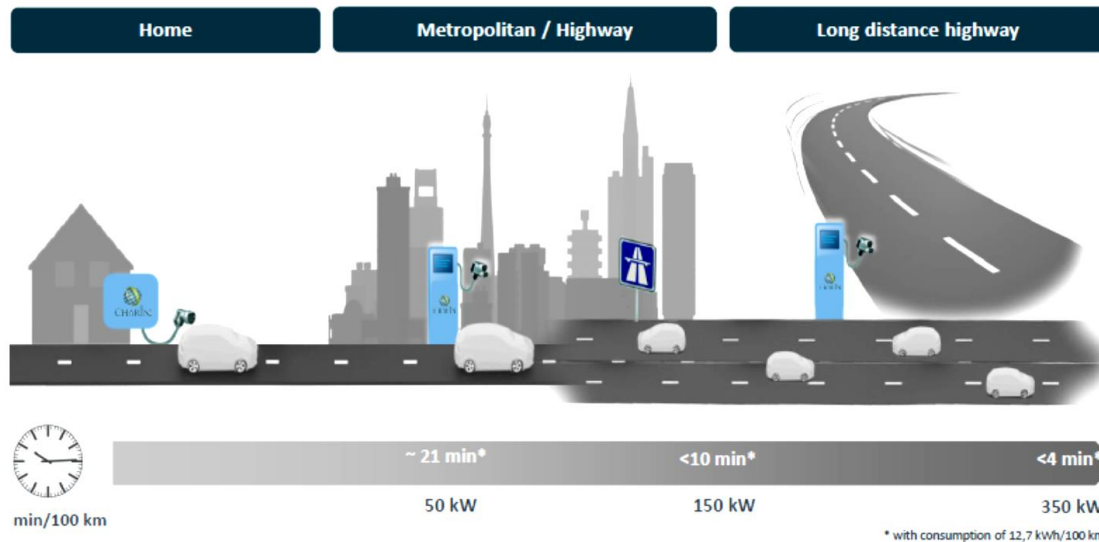
Relation between EV Battery capacity and charging power capability



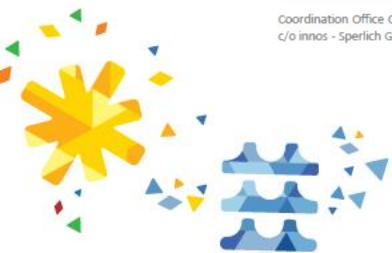


Future charging offers flexible mobility

Charging Time for 100 km



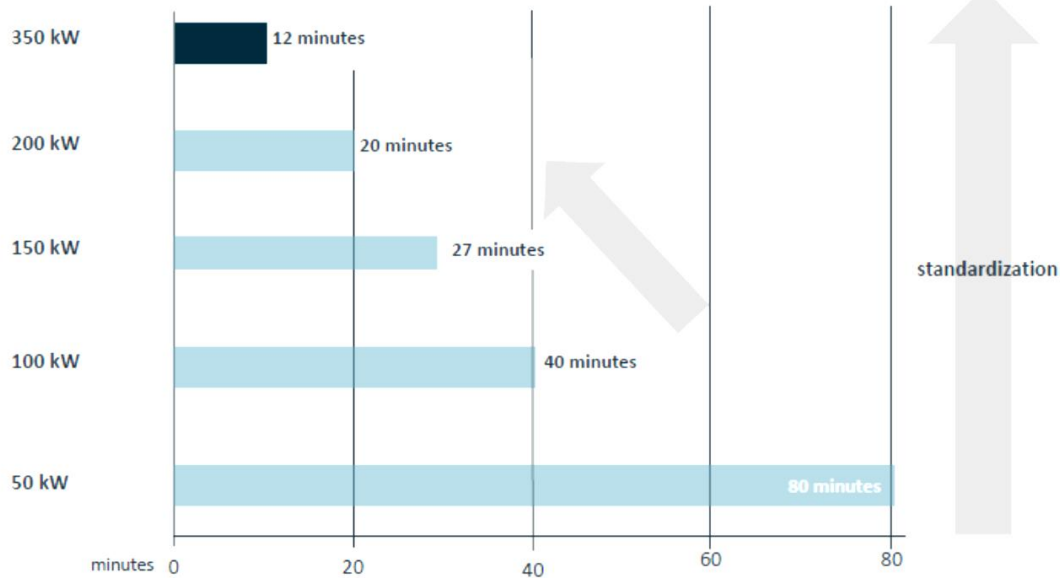
CCS next level offers more flexibility in mobility





Standardisation – Perspectives for CSS

Charging time for 400 km range



Reduction of charging time by increasing the charging voltage up to 1.000 V and/or the charging current to >350 A



Main lines of evolution in the EV charging for the next years

EV charging power increase

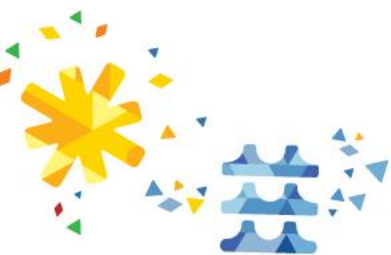
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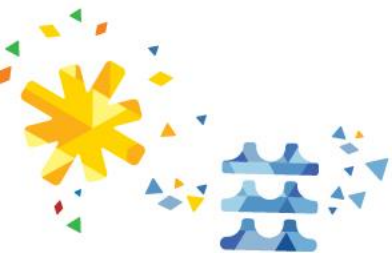
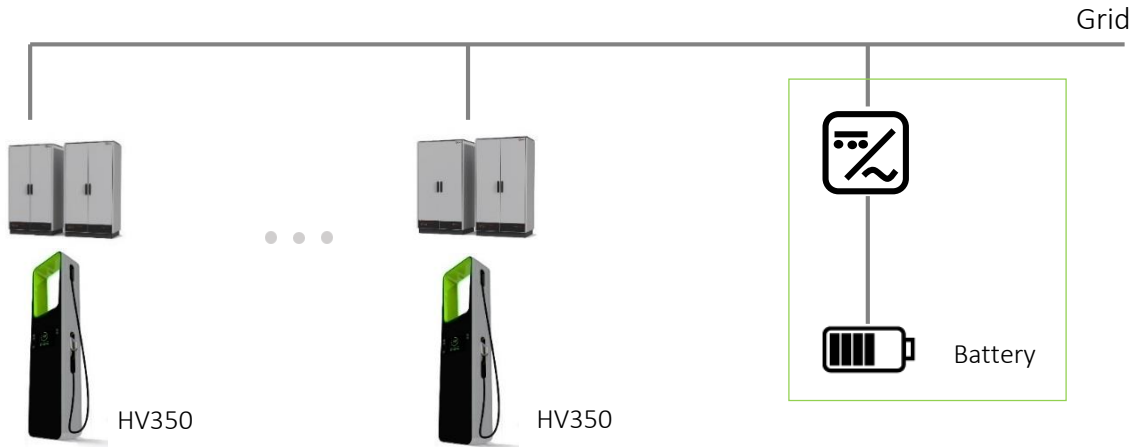
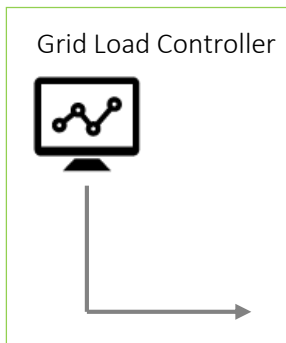
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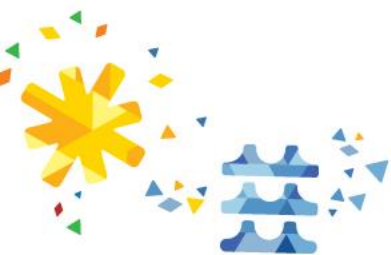
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EV market and ISO15118

ISSO/IEC15118 – today use-cases



Vehicle to grid communication

Simple payment and billing

- Automatic payment from PEV and other payment methods
- Secure payment via state-of-the art signature & certificate usage

Optimized load management

- Cost, - renewable – and Battery-optimized charging with load levelling
- Fleet-charging management for areas with High density of PEVs

Additional customer services

- Access to internet-based services incl. home network integration
- To be specified in detail

AC/DC charging control

- DC fast charging targeted to public infrastructure
- Charged-control via voltage and current control & status commands

Source: Charin



GOAL: One communication solution for all charging needs

EV market and ISO15118

ISSO/IEC15118 – future use-cases

Vehicle to grid communication

Simple payment and billing

Optimized load management

Additional customer services

- WPT (wireless power transfer) for convenient Customer Experience
- One wireless communication channel for fine positioning, pairing and charge control
- Authentication of off-Board charging Equipment via same methods used for AC and DC charging
- Reverse power flow for smart grid Support
- Charged-Control via control&status command
- Re-usage of communication technology for AC & DC & WPT charging (i.e. single interface)
- Support for Electric busses (public transport)
- Control of pantograph for connect/disconnect
- Short-time, High power DC charging a public bus stations

Source: Charin

Additional Focus: Wireless Communication & Extended Smart Grid Support



Main lines of evolution in the EV charging for the next years

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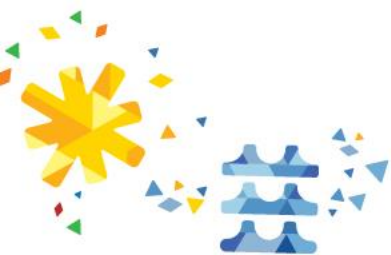
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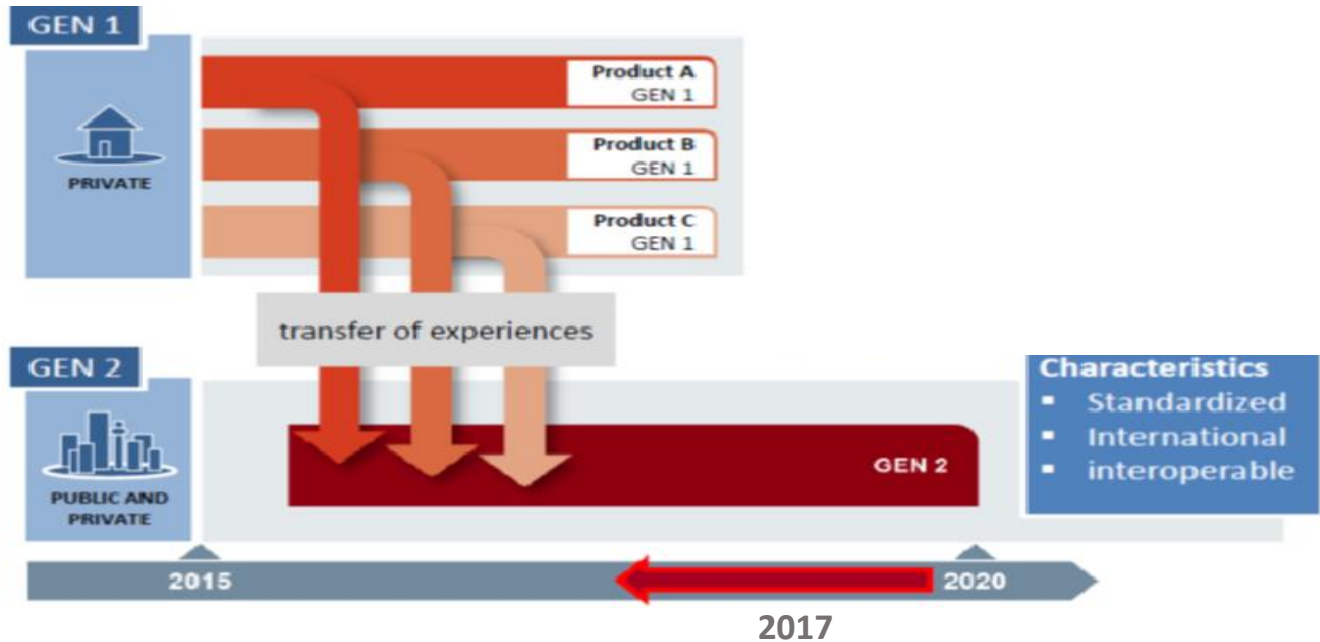
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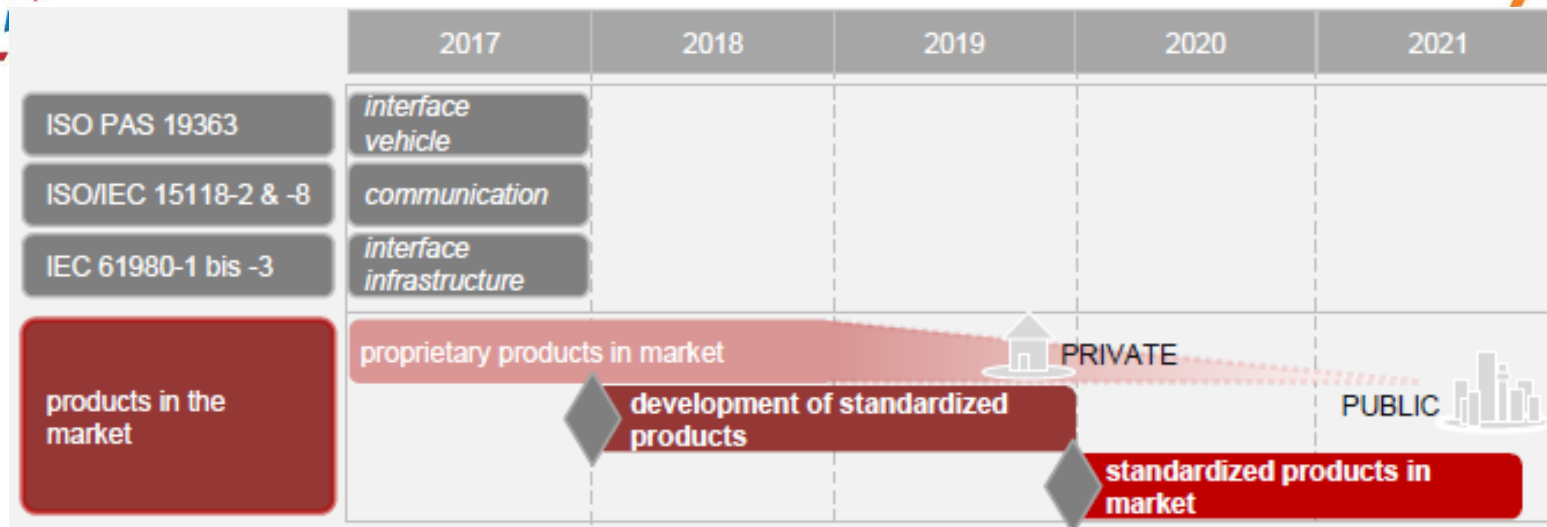
Bidirectional charging: V2X





Generation 1 products
are still not
interoperable

The EU commission has requested a finalized international standard for WPT till the end of 2019. Germany has committed to fix basic interoperability parameters till mid of 2017. All products of the second generation shall be interoperable in the public area.



Only a generic description will steer clear of patents

We are aiming at one interoperable solution worldwide for the public area

We are aiming at a standardization description without patent claims

Many topics are still open





Main lines of evolution in the EV charging for the next years

EV charging power increase

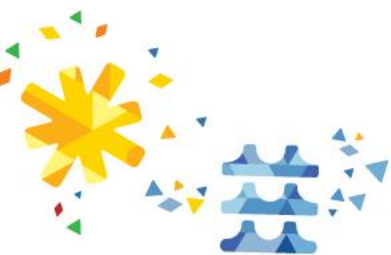
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What is the future of AC charging?

Bidirectional charging: V2X





Home
75%



Work
10%



City
10%



Highway
5%

Destination

Slow charging is the most frequently used

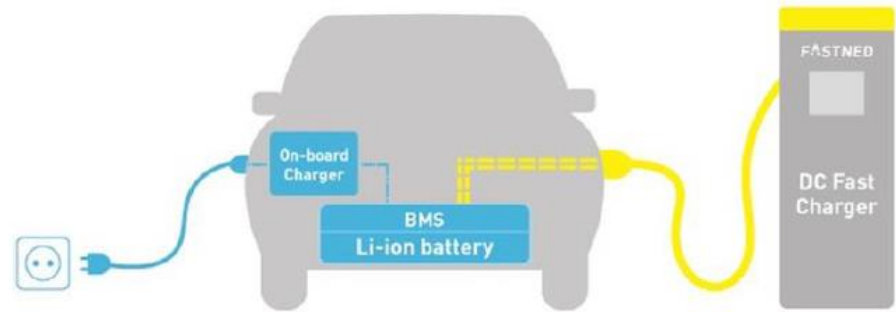




AC charging

DC charging

- Consumers, companies and governments are investing in AC charging infrastructure
- Onboard AC chargers have some fundamental drawbacks when BEV's become a mass market
 - Cost
 - Weight
 - Complexity
 - Volume



Will AC charging disappear in the future?

Or will it continue to be the main form of charging, since that is the current way of slow charging?





Main lines of evolution in the EV charging for the next years

EV charging power increase

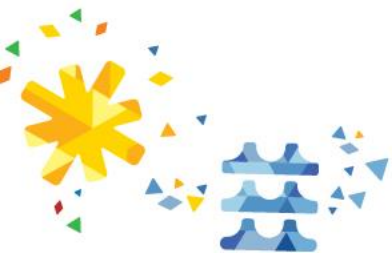
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V2L

Vehicle to Load

Use cases: emergency/blackouts,
camping
Business case: X

V2H

Vehicle to Home

Use cases : blackouts, combination with
PV, peak shaving
Business case : X

V2V

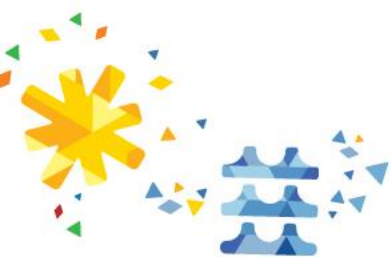
Vehicle to Vehicle

Use cases: battery SOC at a minimum,
highway rescue
Business case: X

V2G

Vehicle to Grid

Use cases : grid ancillary services,
microgrids
Business case : Yes with aggregator



V2X Discussion

V2X seems that will never exist with AC charging
(cost of the on board charger increases)
But only with DC charging



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Thank you.

