

מדרש

Join the forerunners



Smart electric vehicle charging experiences

Powered by



Ville Väre



Education & Trainings

Tampere University of Technology

Tampere, Finland (2008 - 2014)

Master's degree: Energy & Industrial Management

NordPool: Certified electricity trader (2015)

FSR: Regulation for energy utilities (2016)



Work history highlights



Virta Ltd, (Liikennevirta Oy) Helsinki, Finland

Sales Director, Energy

September 2020- Present

Manager, Energy Services

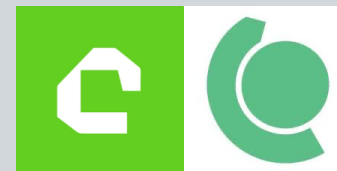
November 2018 – September 2020



Energy Authority, Helsinki, Finland

Senior engineer, Energy markets

November 2014 – November 2018



Caruna - Fortum, Espoo, Finland

Sales engineer, grid specialist

January 2014 – November 2014



Metsä Board - Pohjolan Voima,

Hämeenkyrö Finland

Power plant operations engineer

April 2012 - December 2013

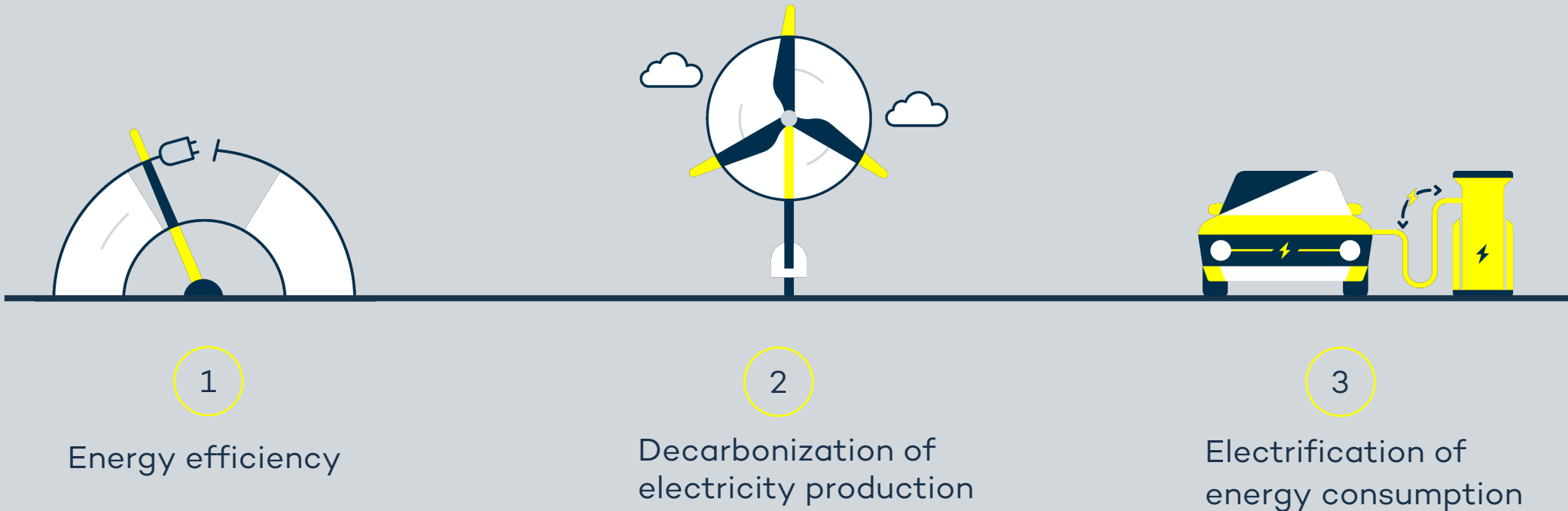
Climate change calls for our action



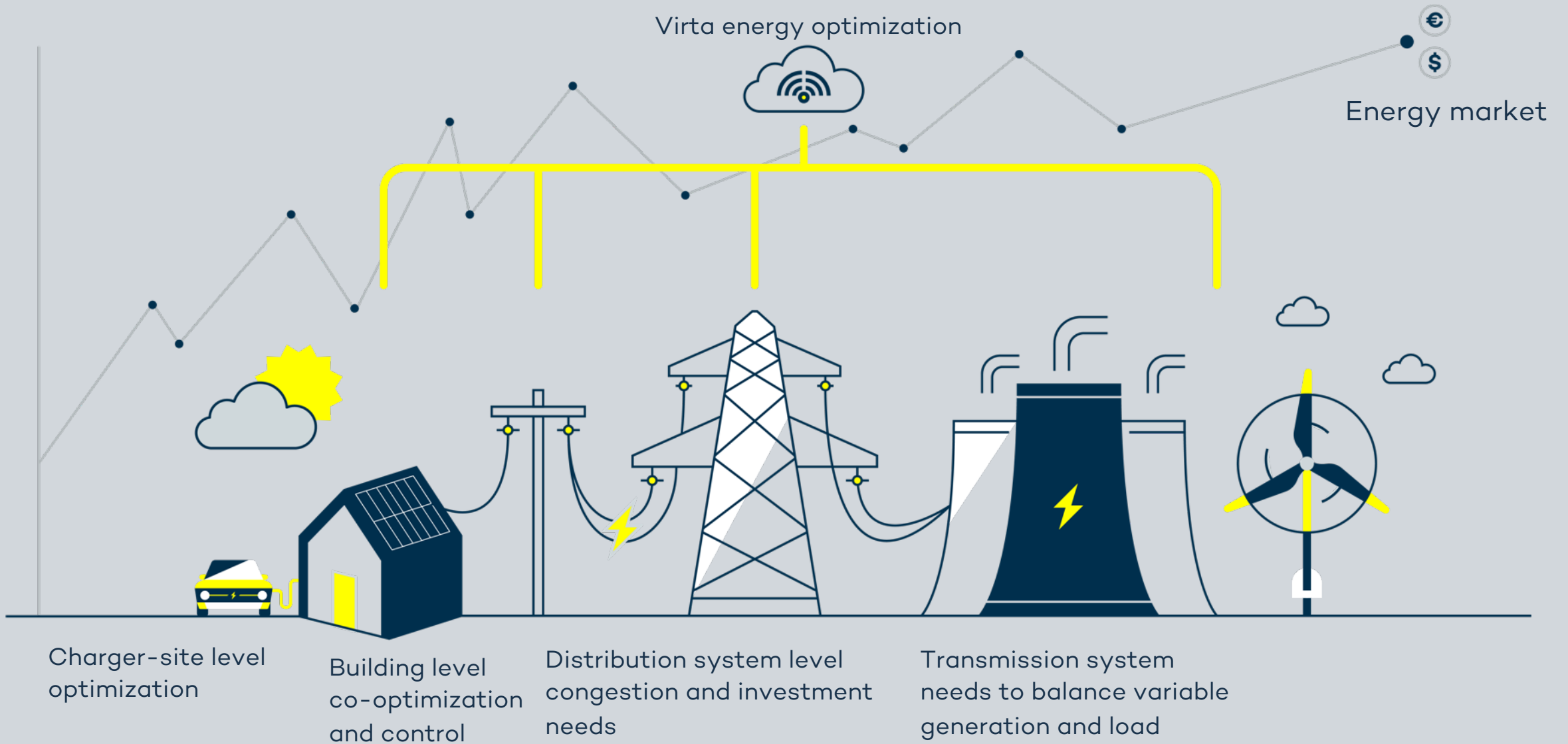
The story

Three pillars of stopping the climate change

Electrify everything with zero-carbon power




Energy ecosystem is changing significantly



The electric vehicle revolution is on

- The low-emission car fleet will grow from 975k to 13 million in 5 years.
- There is a leap in the availability of new, affordable EV models in 2020.

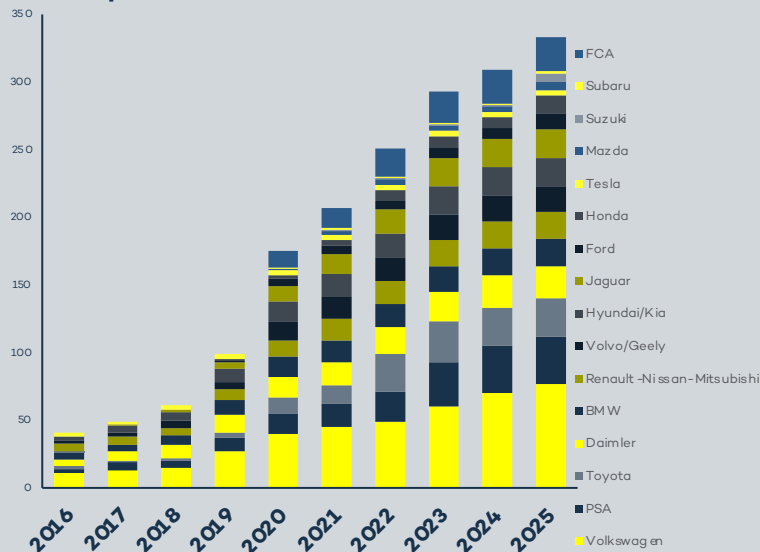


x13 growth
in European
low-emission
fleet **by 2025**

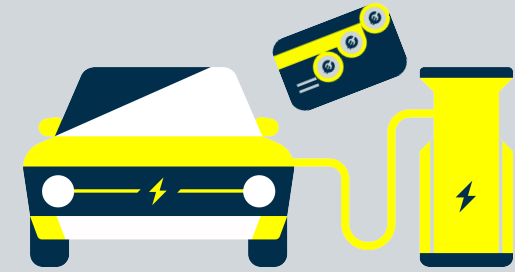
EV market transformation

1 The **CO2 targets** are becoming ever **more demanding** worldwide and the vehicle manufacturers have to adapt their cars portfolio to stay in the game.

Total number of available EV models on the market in Europe

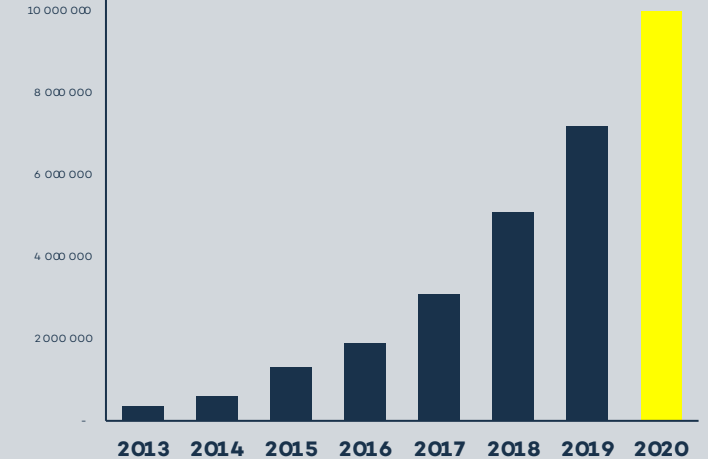


2 Supply of new EVs with ever longer average ranges is rising, from about 70 models available in 2014 to **250 models in 2019**, and up to **450 models** expected on the market by **2025**.



3 The **price parity** of EVs and petrol and diesel cars is approaching fast thanks to the **technology development** and **increasing CO2 compliance cost**. Some manufacturers can achieve it by **2023**.

Global electric car fleet

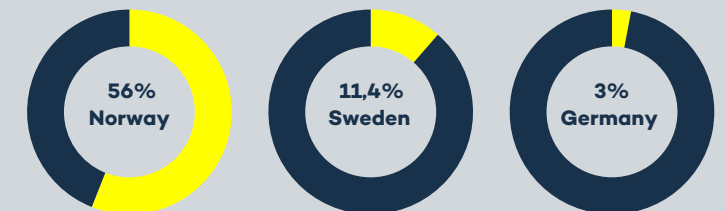


4 The global electric car fleet exceeded **7.2 million in 2019** and is expected to achieve a new record of **10 million vehicles in 2020**.

5 **Every second car** driving in Norway is **now electric**. With Norway leading the trend, the **EV market share is rapidly growing** also in other countries.

EV market share by country

% of cars are EVs



EVs will shape multiple businesses

1 Customers, employees and residents will demand charging

Charging is a must-have service for EV drivers anywhere they move.

Customers will choose services based on where they can charge. Others will lose revenue.

2 Regulators will push for charging stations in your parking lots

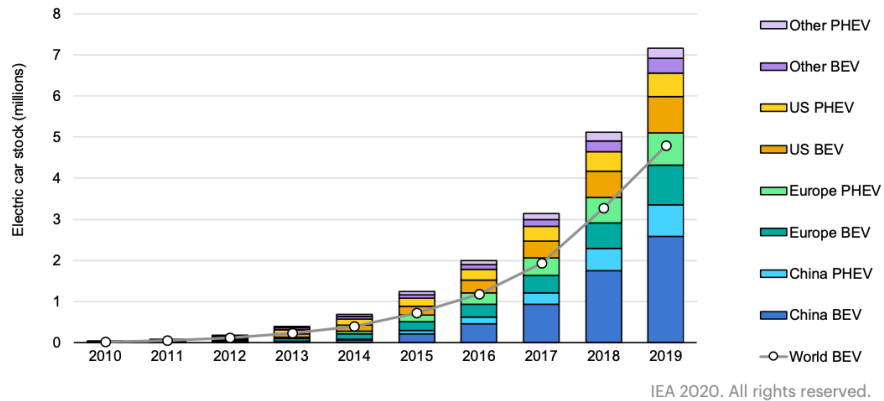
New constructions and large renovations require pre-wiring of parking spaces for charging stations.

Workplaces, commercial sites and residential buildings must be equipped with chargers sooner than you think.

How, then, can you be on the winning side when EVs take over?

Some numbers behind EVs

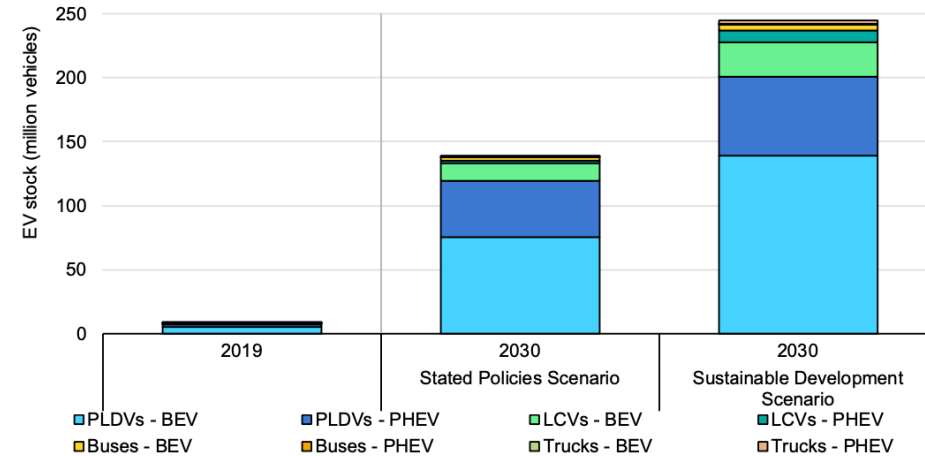
Global electric car stock, 2010-19



Sources: IEA analysis based on country submissions, complemented by other sources. For more details, see figure 1.1 in the main report.

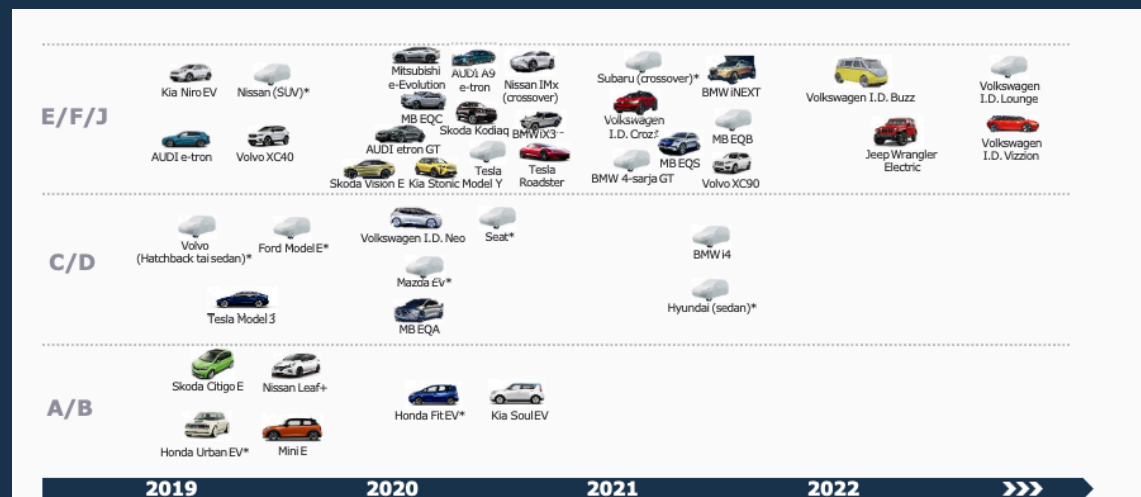
Electric cars, which expanded by an annual average of 60% in the 2014-19 period, totalled 7.2 million in 2019.

Global electric vehicle stock by scenario, 2019 and 2030



Notes: PLDVs = passenger light-duty vehicles; LCVs = light commercial vehicles; BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle.

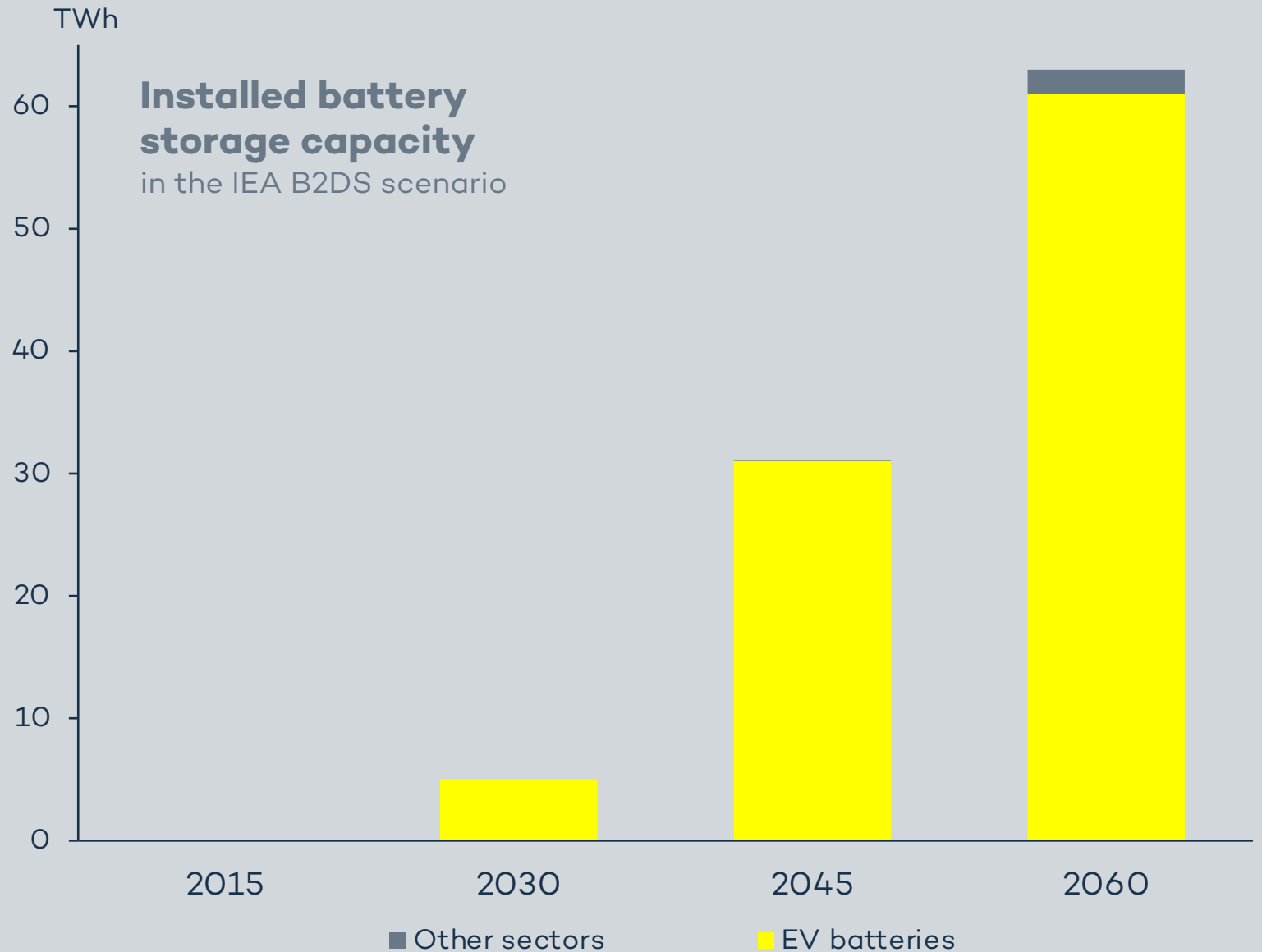
Source: IEA analysis developed with the [IEA Mobility Model](#).




The story

EVs are big batteries on wheels

- The vast majority of future energy storage capacity will have four wheels
- EVs as energy storages cause zero incremental costs



Source: IEA: Electricity well below 2 degrees: From challenges to opportunities 2017



Virta - Smart electric vehicle charging platform

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Virta Key metrics

No. 1

Europe's fastest-growing EV charging service provider

2nd

Largest market player in Intercharge roaming networks in Europe

x5

faster growth than the EV market on avg

300+

B2B customers

50+

Customer brands

28+

Countries with charging networks on Virta Platform

167M+

EV kilometers charged at Virta stations in 2019

+1040%

Charged energy in 2019

+902%

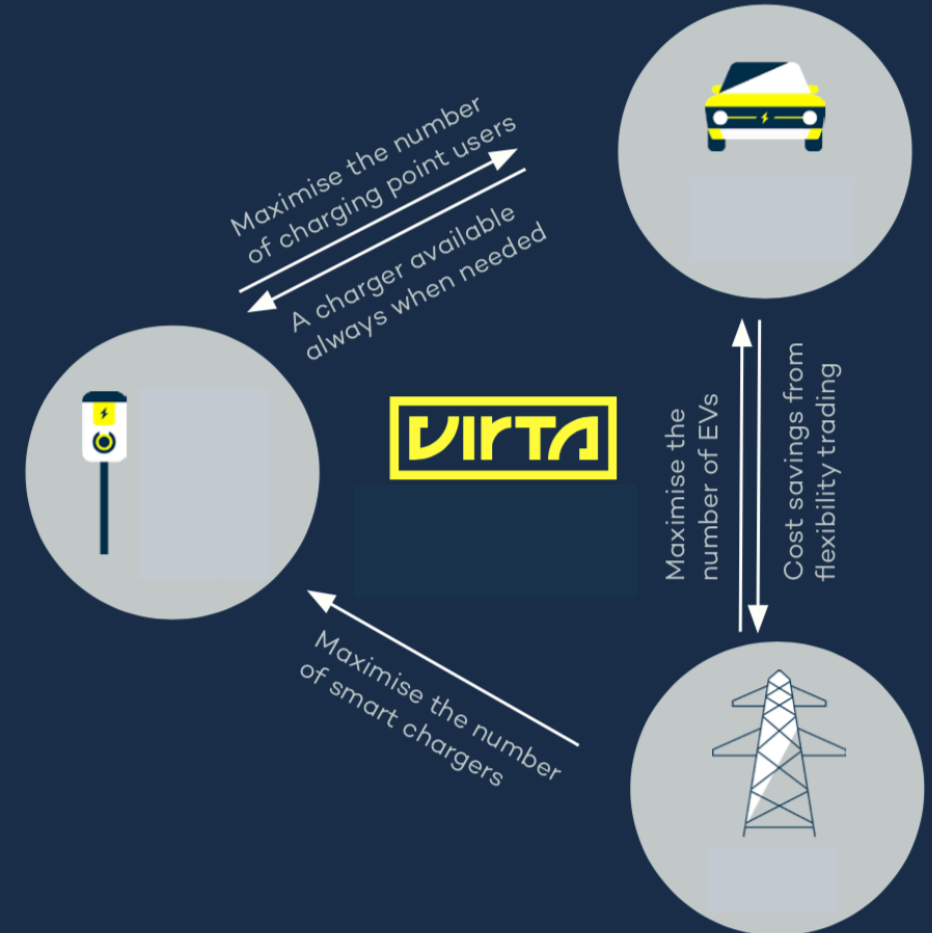
Charging transactions in 2019

+552%

Registered customers in 2019

+134%

Connected charging points in 2019



This is Virta

A top
European
player

300+

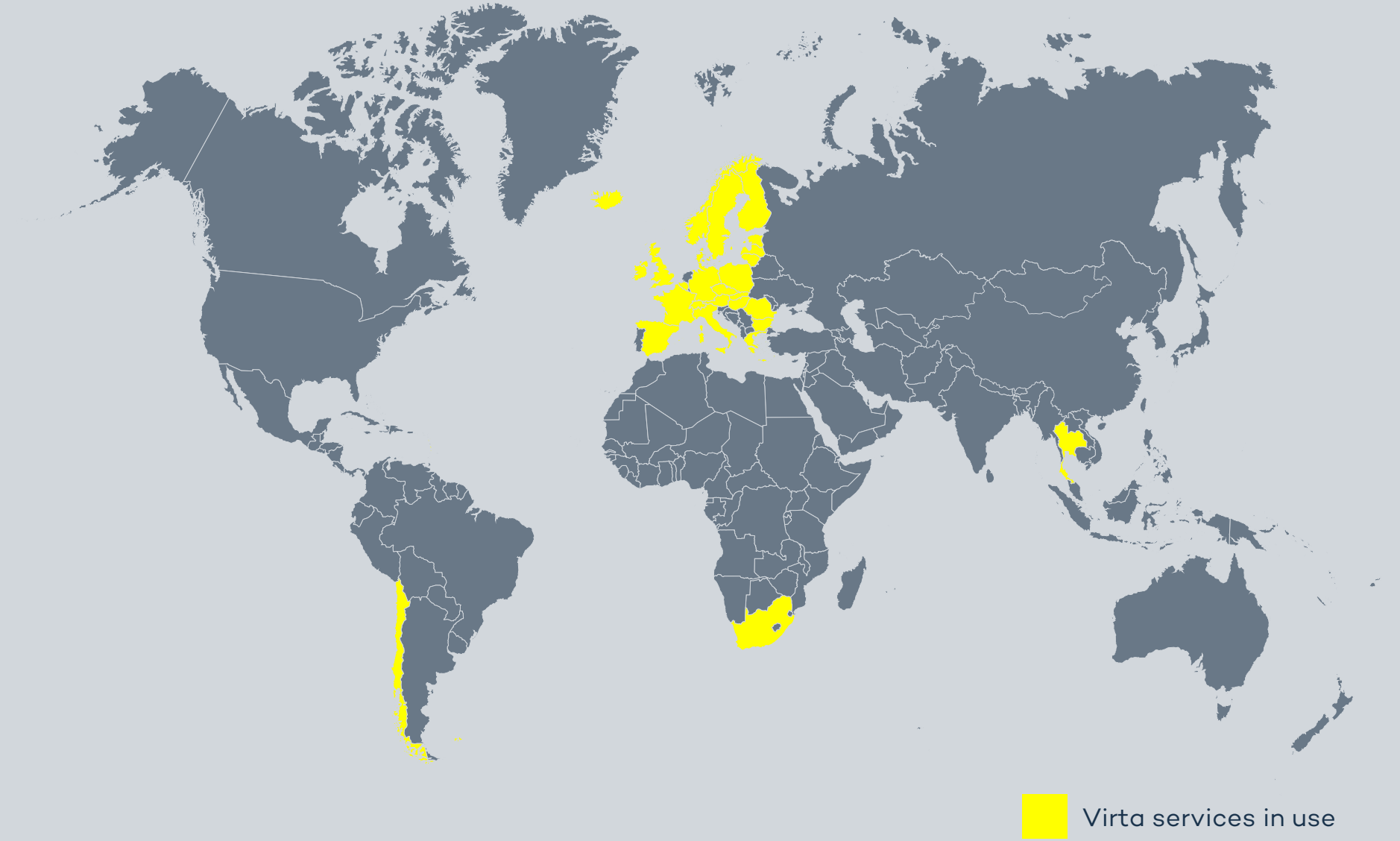
B2B customers

50+

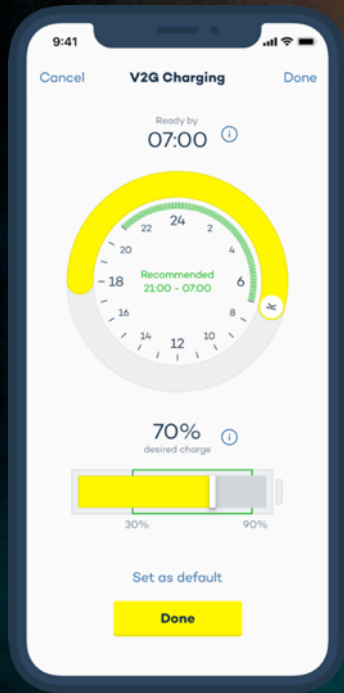
Customer brands

28+

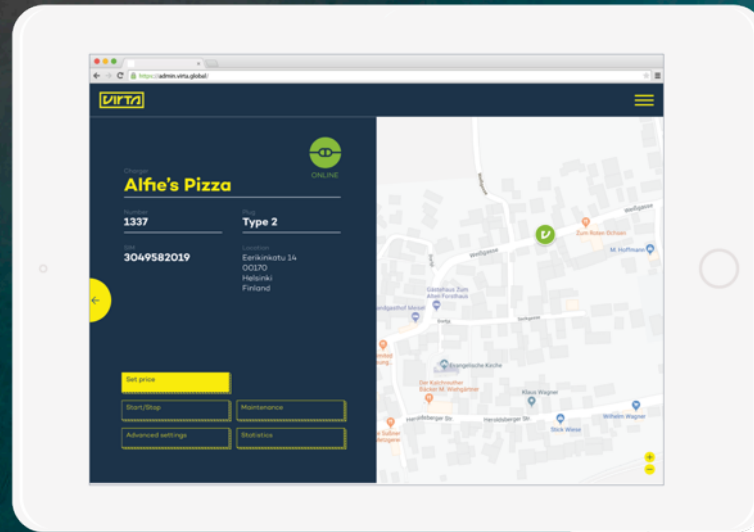
Countries with charging
networks on Virta Platform



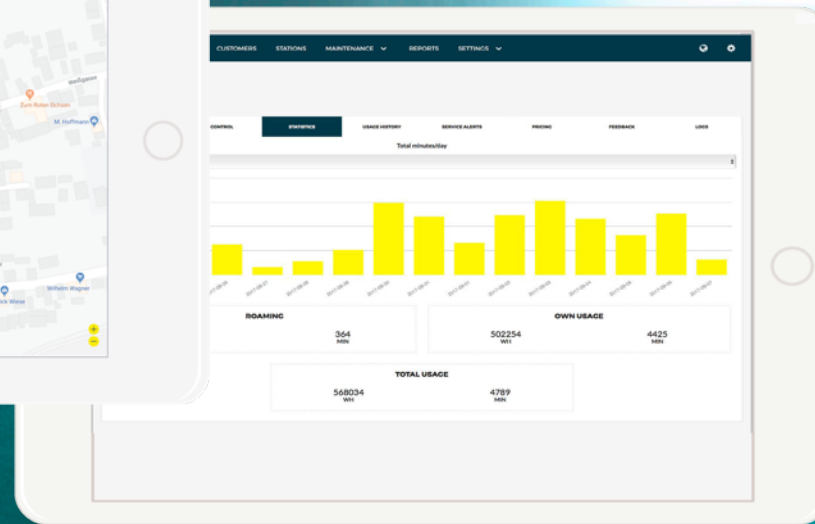
Virta - The Smart Electric Vehicle Charging Platform



EV driver Apps



Business Platform



Energy management



Chargers

Our services

We take care of charging everywhere

- Choose the service you need: Public, Private or Branded.
- Master the site's energy with Advanced Energy Management



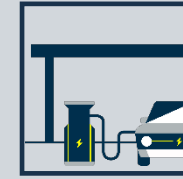
**Virta
Public**

Charger accessible for everyone



**Virta
Private**

You decide who charges at the station



Branded

Your customers – your brand



Advanced Energy Management

Sky is the limit – not energy

EVs and charging points growth - Finland

Status in Finland

CARS	Q3/2019	1 Year ->	Q3/2020
Electric Vehicles	25033	+22888 (+91%)	47921
BEV	4204	+3696 (+88%)	7900
PHEV	20809	+19192 (+92%)	40021

CHARGING	Q3/2019	1 Year ->	Q3/2020
Charging locations	905	+286 (+32%)	1191
Type 2 charging points	2646	+1144 (+43%)	3790
Fast charging points (CCS,CHAdeMO)	220	+112 (+51%)	332

Requirements for Finland

→New requirements by Finnish Government

→Minimum req:

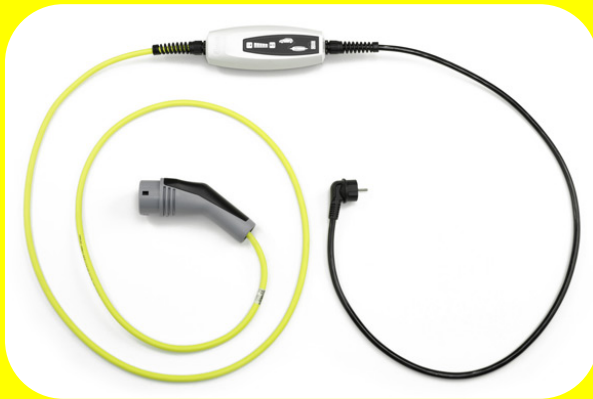
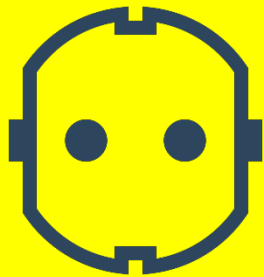
- 11-50 parking slots: 1 standard charger
- 51-100: 2 standard
- 100+: 3 standard
- Readiness for 20- 100 % to parking slots

Technical aspects

EU legislation has unified standards

Power	Current	Distance charged (km/h)*
1,8 kW	8 A 1-phase	9
2,3 kW	10 A 1-phase	12
3,7 kW	16 A 1-phase	19
7,4 kW	32 A 1-phase	37
11 kW	16 A 3-phase	55
22 kW	32 A 3-phase	110
50 kW	125 A DC	250

Mode 2 Slow charging
(Occasional use)



Ways to charge

AC

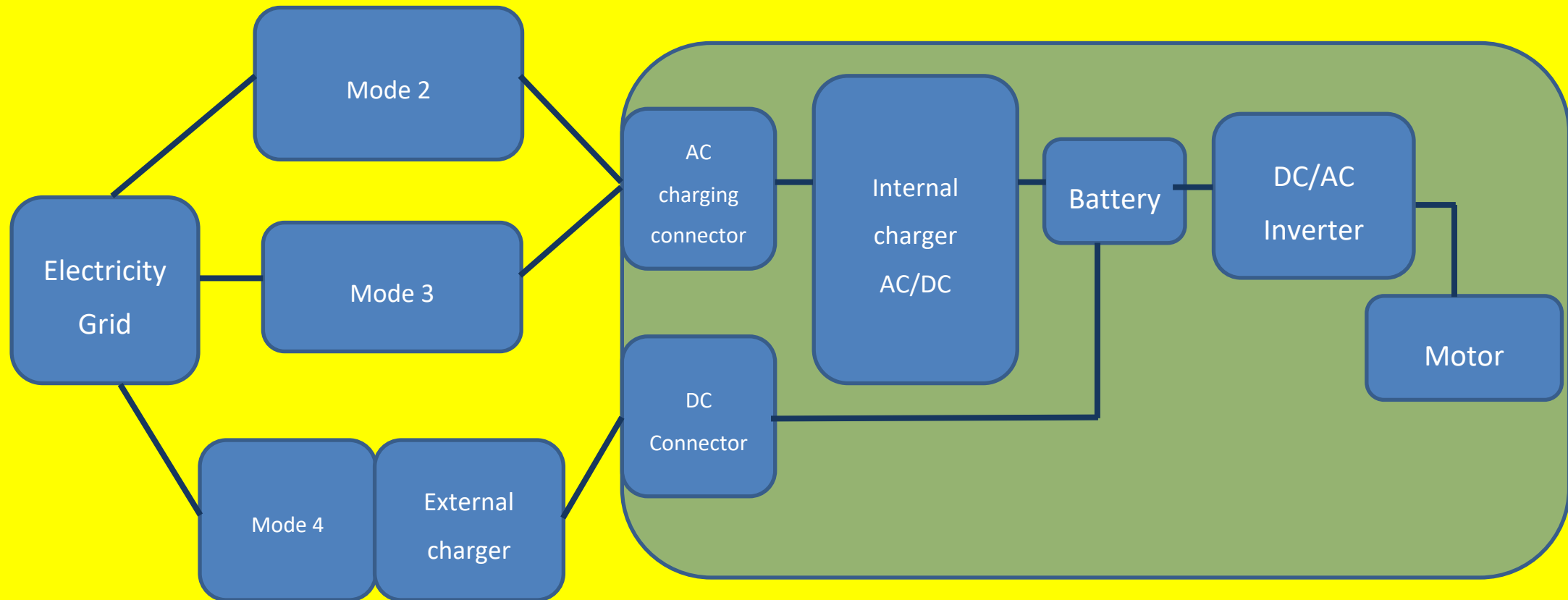
DC

Type 2

CCS

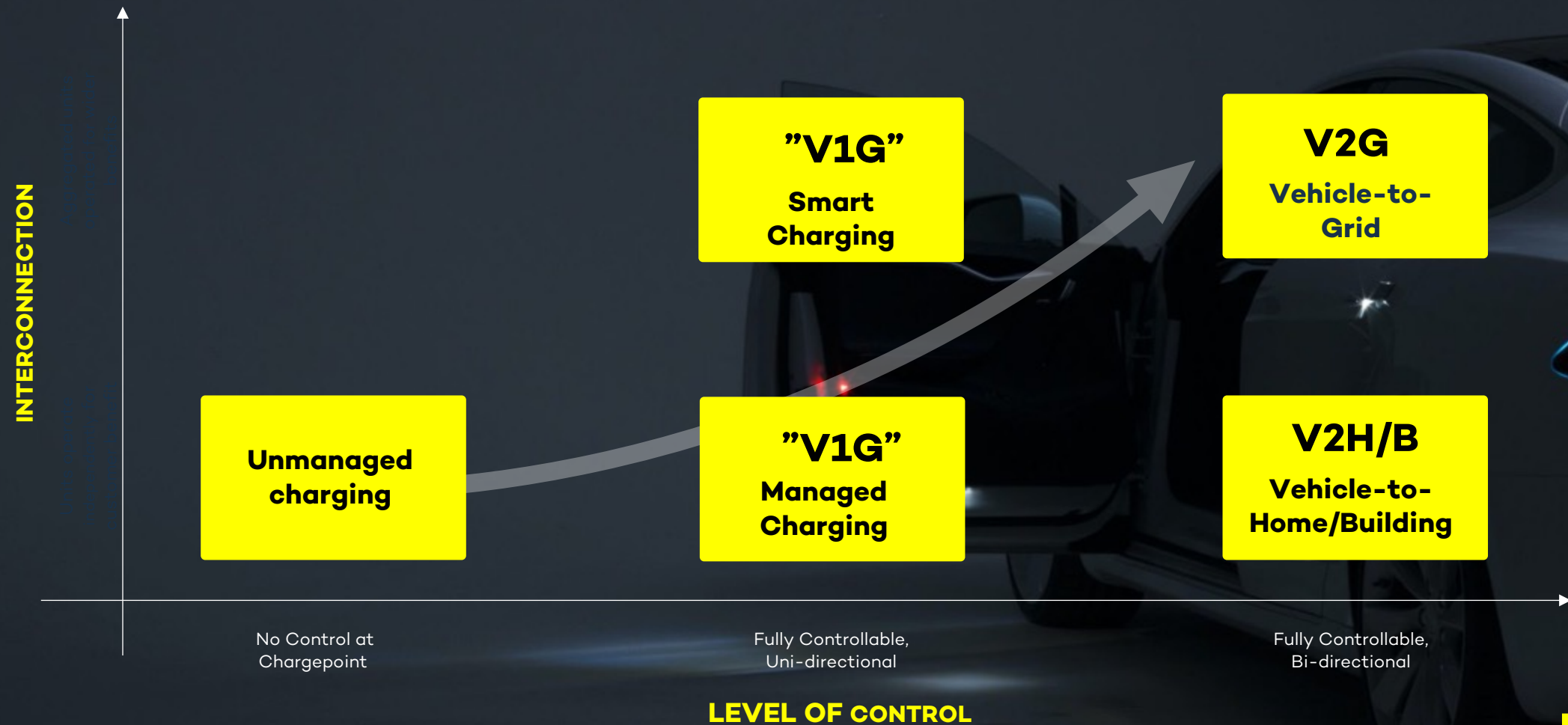
CHAdeMO

Simplified charging chart



What is Smart Charging or V2G?

From unmanaged to bidirectional



Source: Chris Cox, CENEX, Vehicle-to-Grid: Learnings from 5 years of Development, 2019



**Love at
first
charge
since
2013.**



Thank you!

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