

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

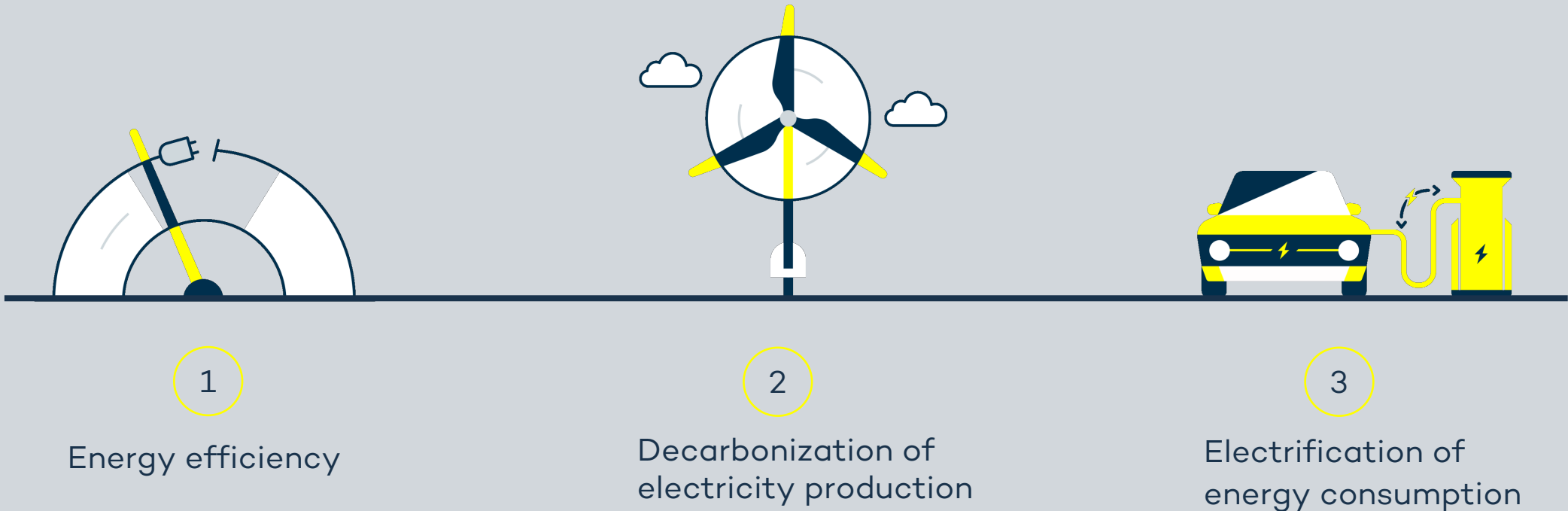
# Climate change calls for our action



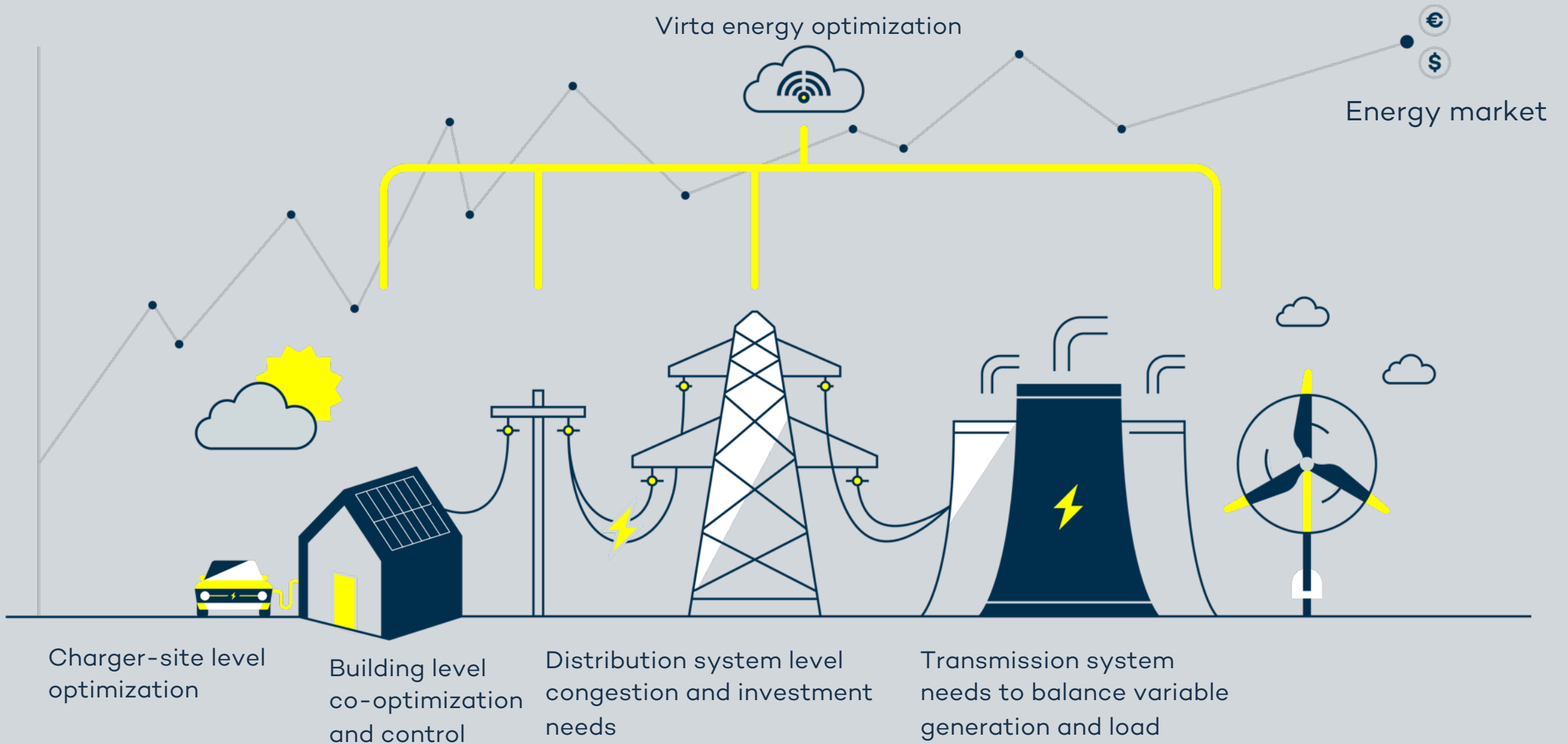
The story

# 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.

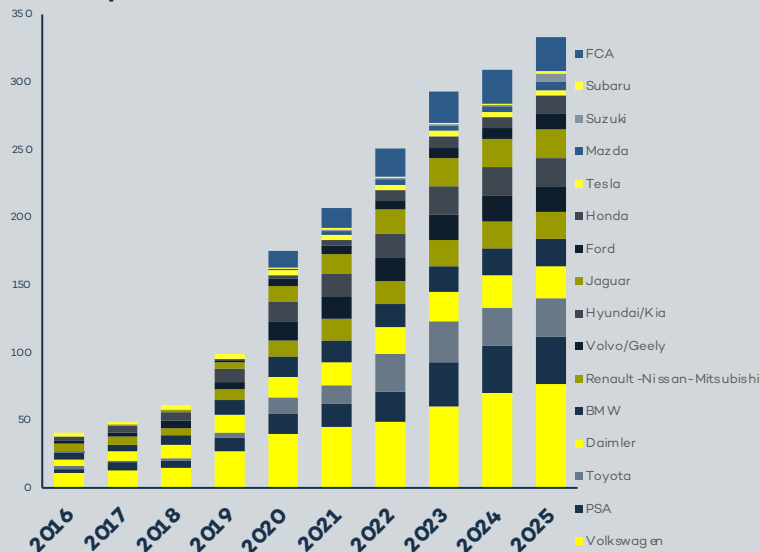


**x13** growth  
in European  
low-emission  
fleet **by 2025**

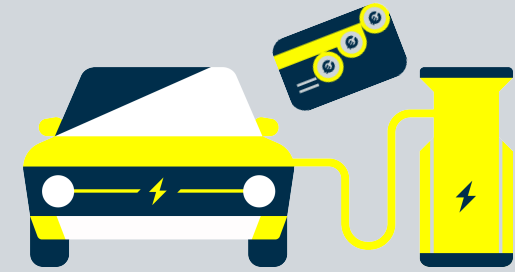
# EV market transformation

**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

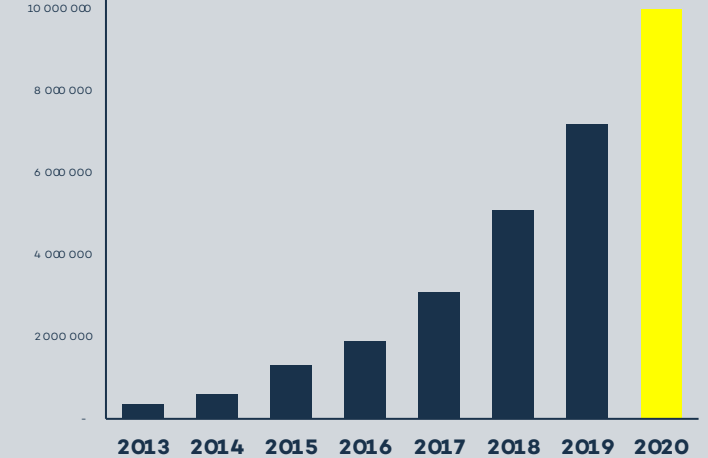


**2** Supply of new EVs with ever longer average ranges is rising, from about 70 models available in 2014 to **250 models in 2019**, and up to **450 models** expected on the market by **2025**.



**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

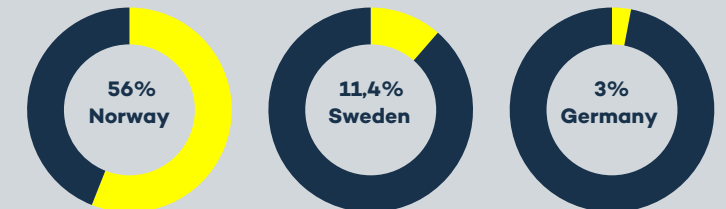


**4** The global electric car fleet exceeded **7.2 million in 2019** and is expected to achieve a new record of **10 million vehicles in 2020**.

**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

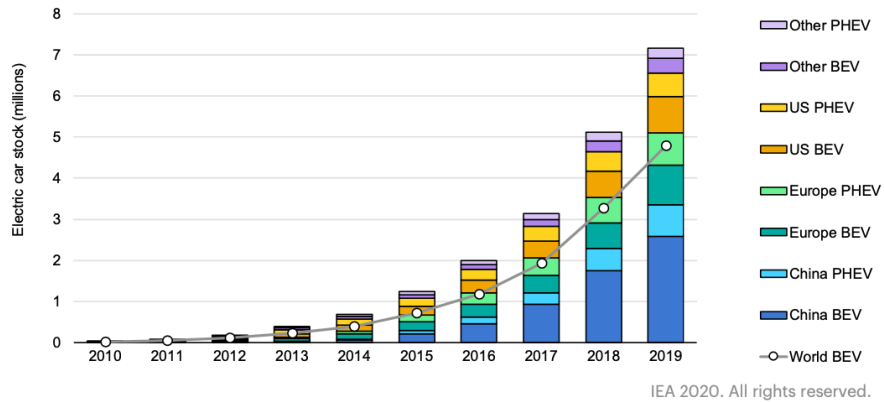
New constructions and large renovations require pre-wiring of parking spaces for charging stations.

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

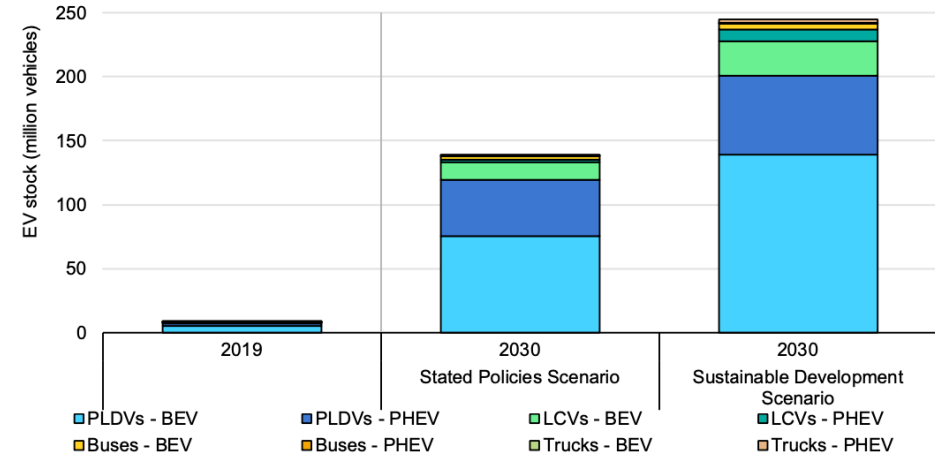
Global electric car stock, 2010-19



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

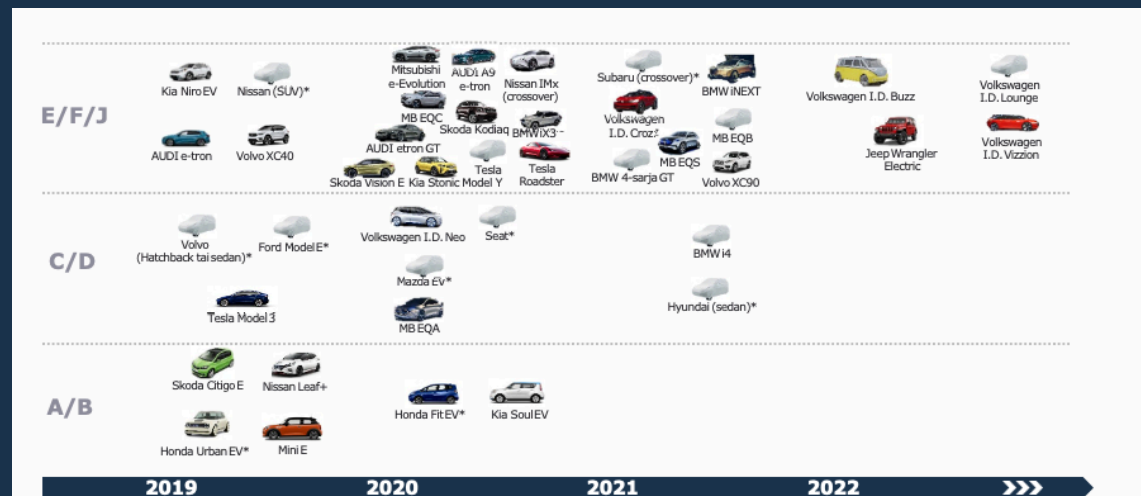
Electric cars, which expanded by an annual average of 60% in the 2014-19 period, totalled 7.2 million in 2019.

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](#).

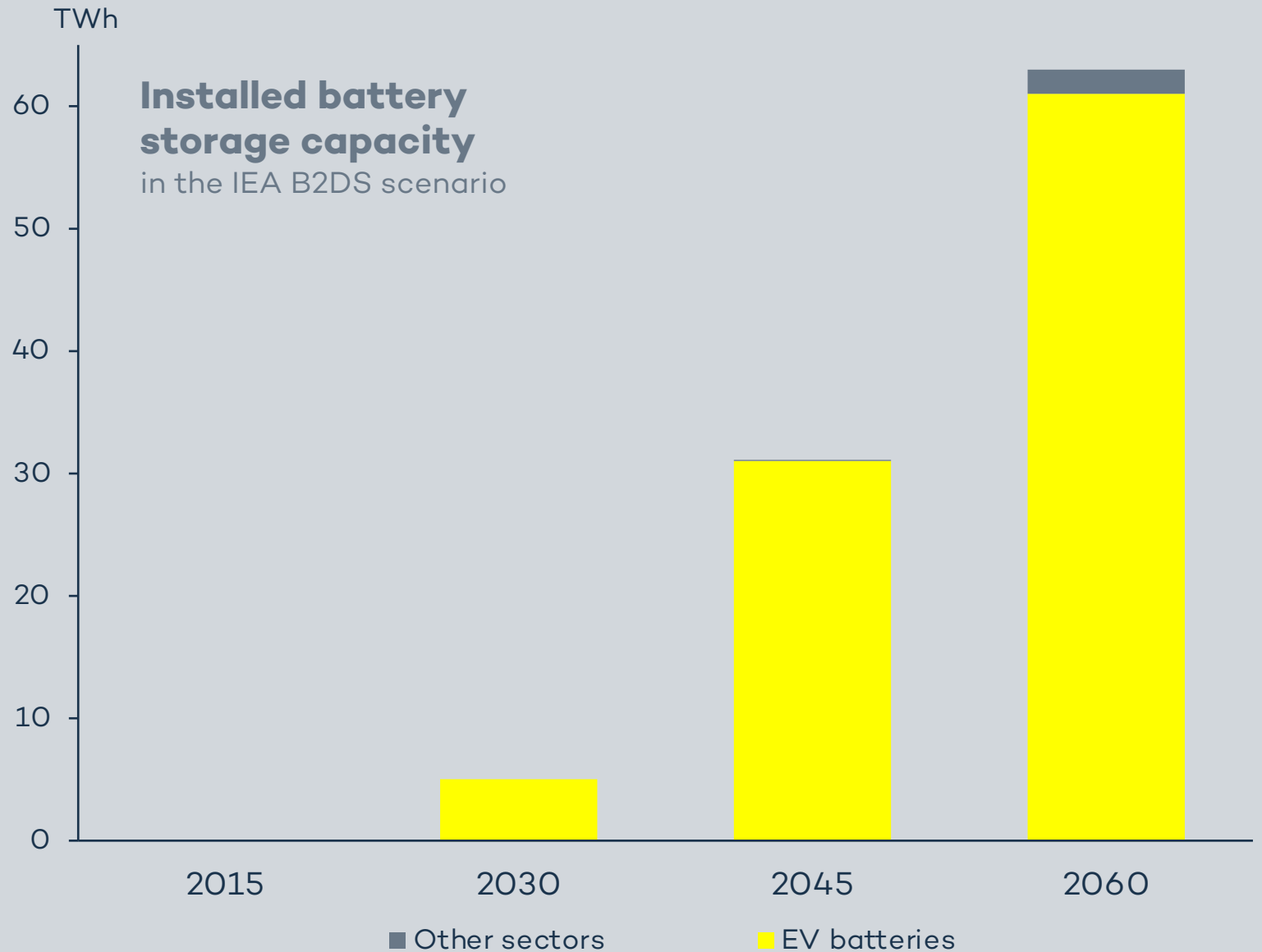


\*Source IEA Global EV Outlook 2020, Teknologiateollisuus


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%**

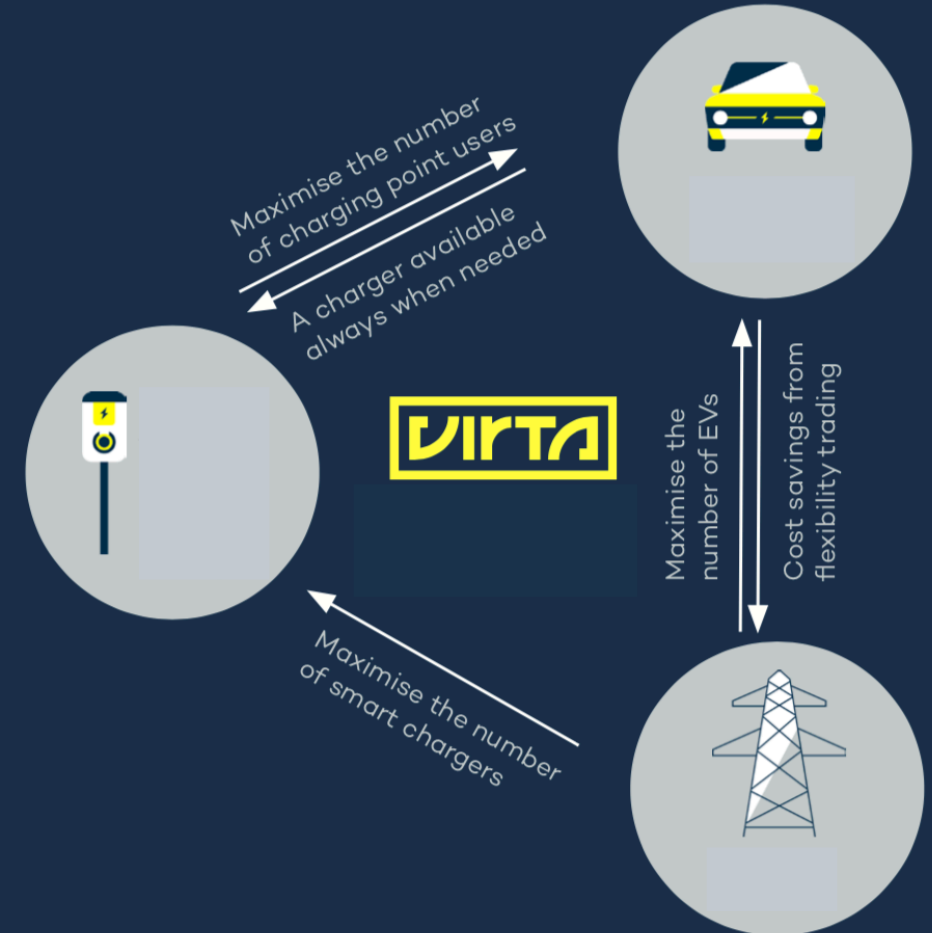
Charging transactions in 2019

**+552%**

Registered customers in 2019

**+134%**

Connected charging points in 2019



This is Virta

A top  
European  
player

**300+**

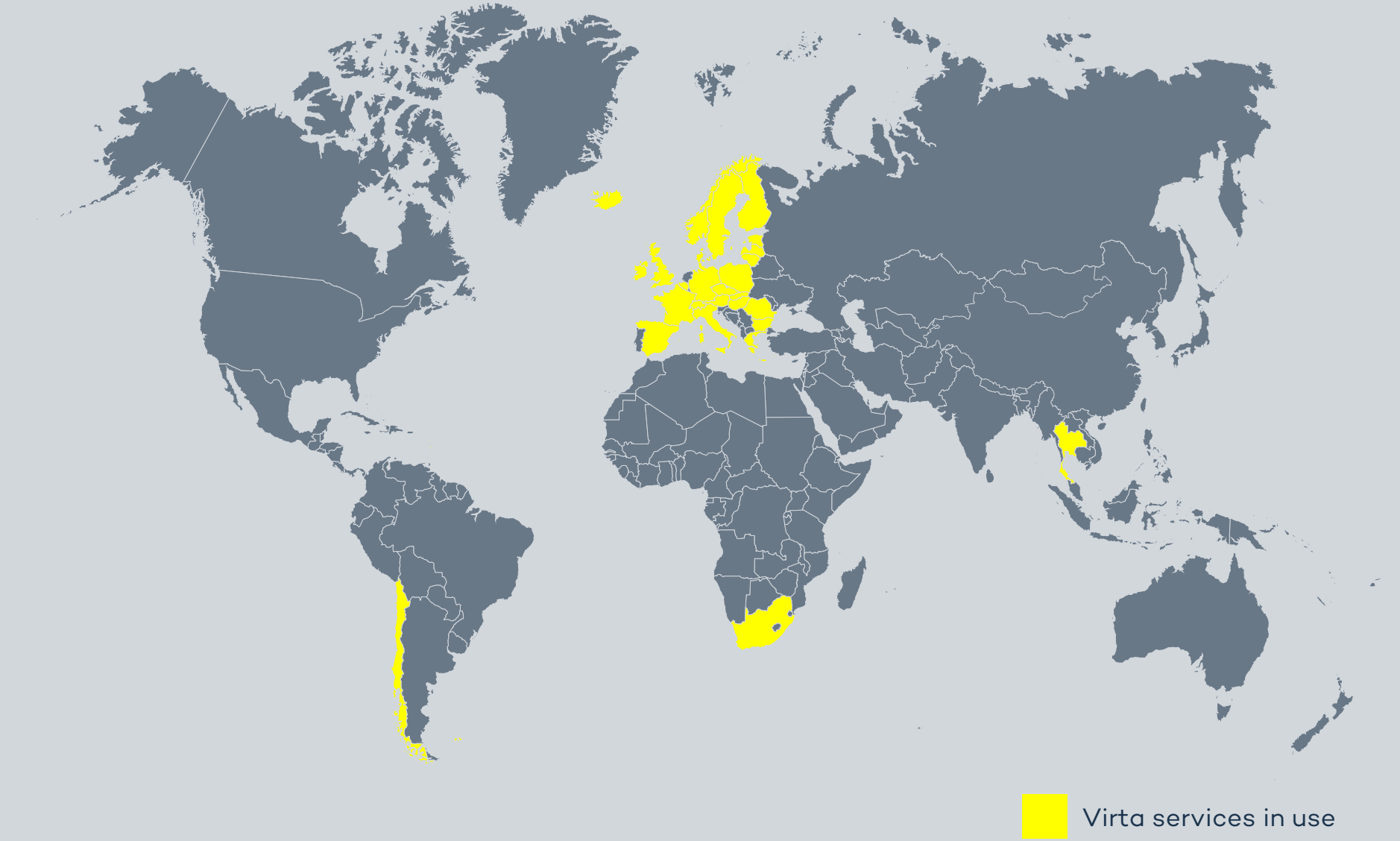
B2B customers

**50+**

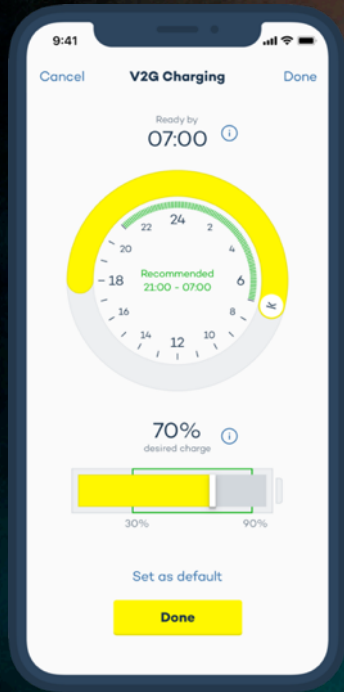
Customer brands

**28+**

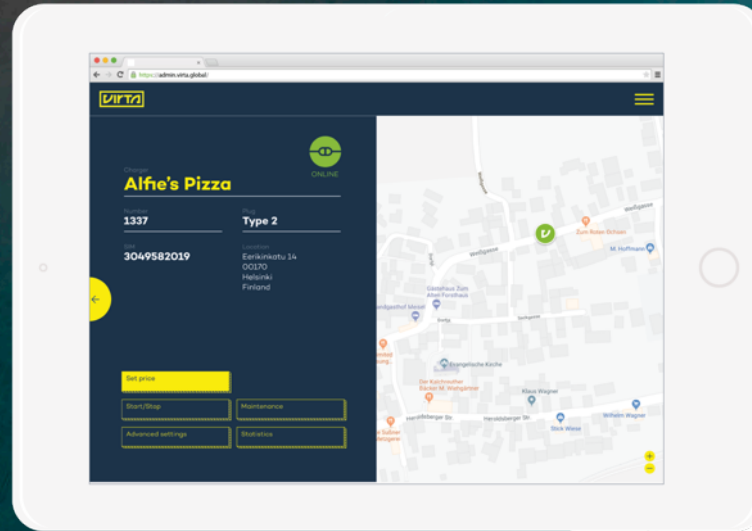
Countries with charging  
networks on Virta Platform



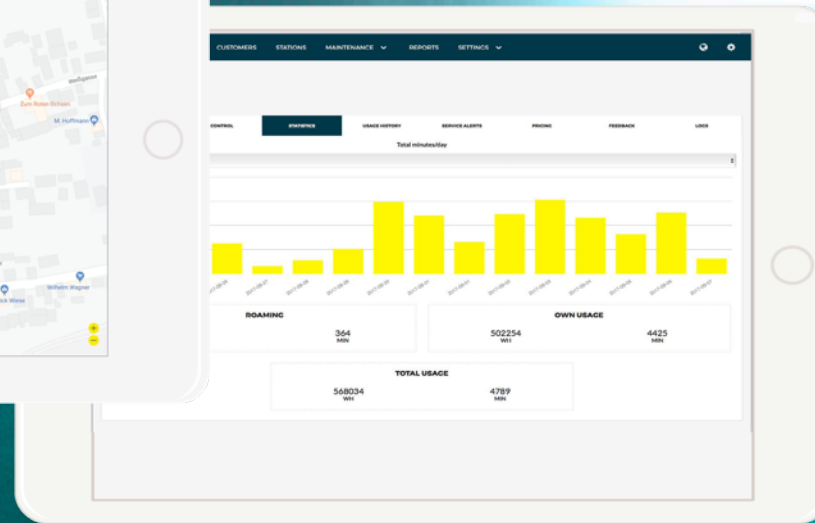
# Virta - The Smart Electric Vehicle Charging Platform



EV driver Apps



Business Platform



Energy management



Chargers

Our services

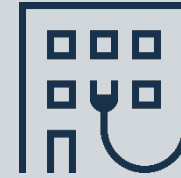
# We take care of charging everywhere

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



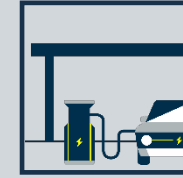
**Virta  
Public**

Charger accessible for everyone



**Virta  
Private**

You decide who charges at the station



**Branded**

Your customers – your brand

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**Advanced Energy Management**

Sky is the limit – not energy

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# EVs and charging points growth - Finland

# Status in Finland

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

<b>CHARGING</b>	<b>Q3/2019</b>	<b>1 Year -&gt;</b>	<b>Q3/2020</b>
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:

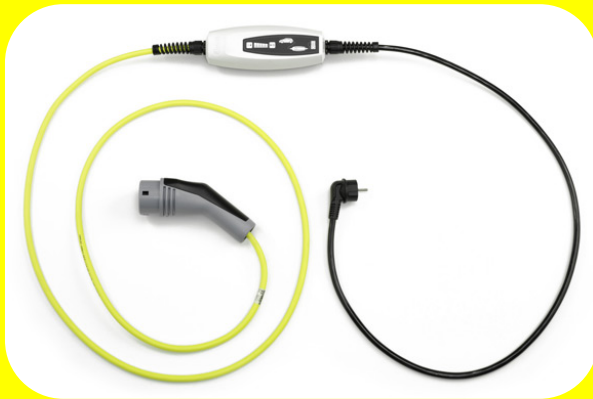
- 11-50 parking slots: 1 standard charger
- 51-100: 2 standard
- 100+: 3 standard
- Readiness for 20- 100 % to parking slots

# 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

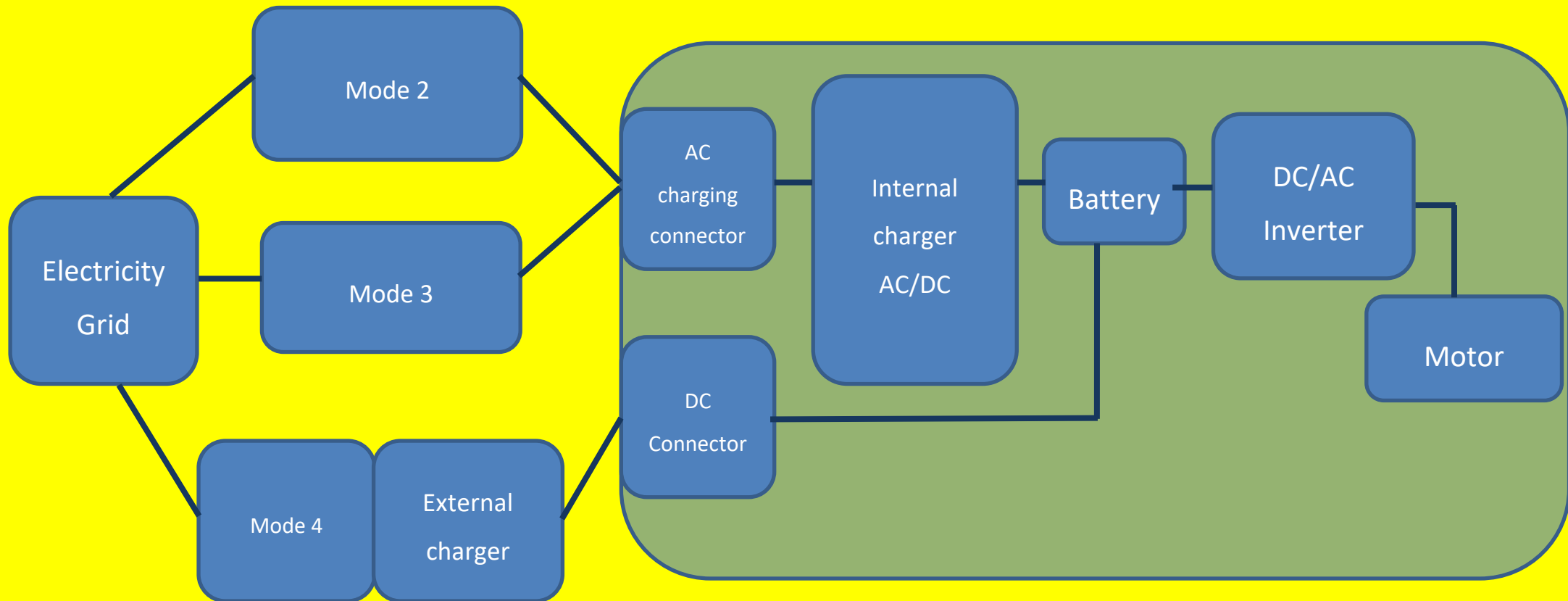
DC

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!**

Ville Väre

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