

# European legislation and the development of electromobility

Radek Novák, Tomáš Kozelský

Economic and Strategic Research

Česká spořitelna, Škoda Auto Vysoká škola

# Agenda

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- International efforts to combat climate change
- EU strategic documents and legislation
- OEM's targets
- Electric vehicles sales and stock
- Infrastructure for electric vehicle
- The Impact of the Electric Mobility on Consumption of Electric Energy in the Czech Republic

# 1992: Rio de Janeiro



1997: Kyoto



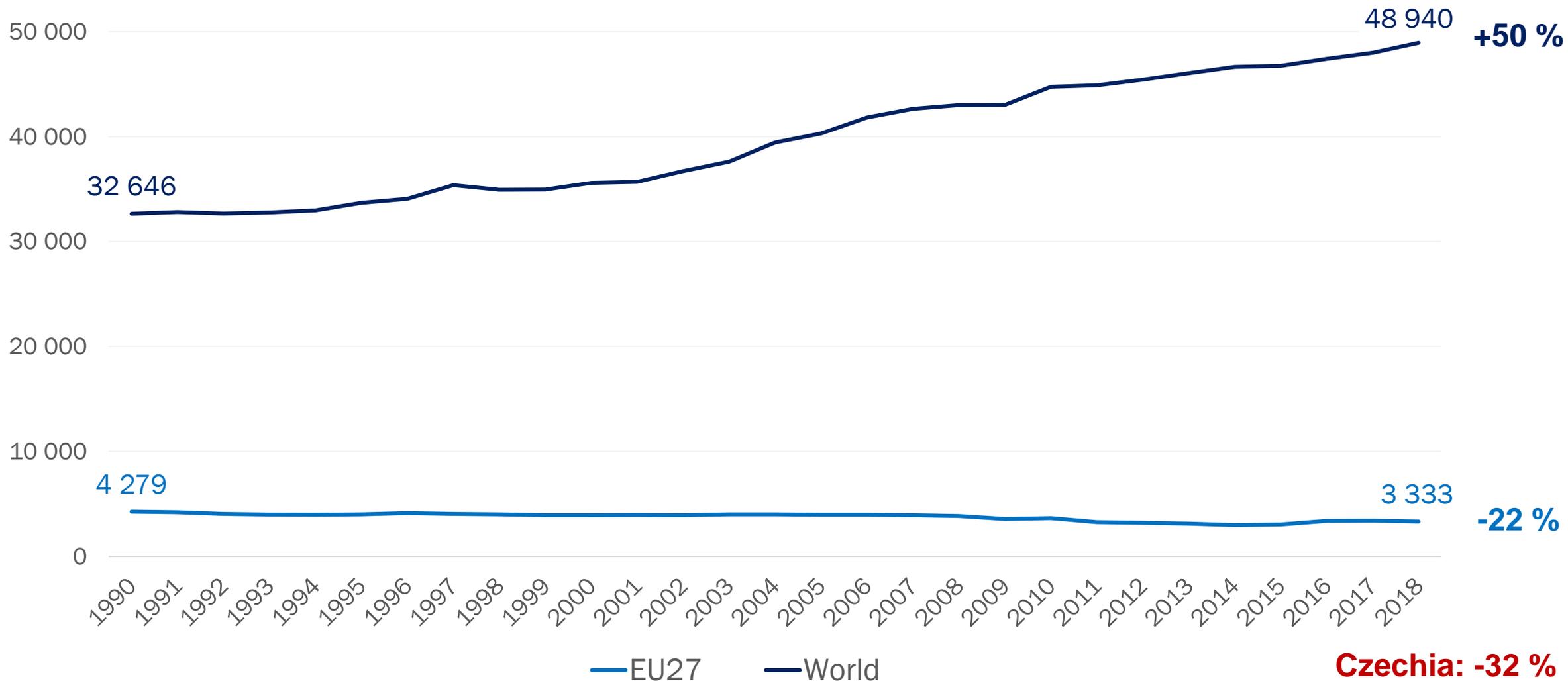
2012: Doha



EU: 20-20-20



# Total global and EU greenhouse gas emissions (million tones CO<sub>2</sub> equivalent)



2015: Paris



# Carbon neutrality targets

2035



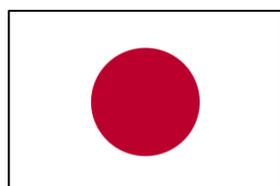
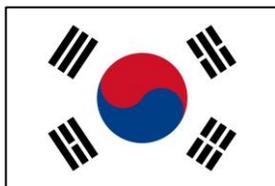
2040



2045



2050



2060



2070



# 2019: EU Green Deal

- It covers all sectors, policies and activities in the EU
- The goal of reducing greenhouse gas emissions by 55% by 2030 is embodied in the so-called Climate Act
- The ultimate goal: net zero greenhouse gas emissions in the EU by 2050



**European Council**  
12 and 13 December 2019



**Conseil européen**  
12 et 13 décembre 2019

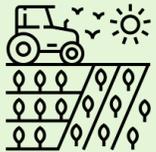


# Green Deal in a nutshell:



## 1) Clean. Secure and Affordable Energy

- Decarbonizing the EU's energy system



## 2) Farm to Fork strategy

- Reduction of pesticide use by 50% and fertilizers by 20% by 2030
- By 2030, ecologically manage 25% of agricultural land
- New food labeling to promote healthy and sustainable products



## 3) Sustainable industry and the circular economy

- Modernize and decarbonize energy-intensive industries
- Support European industrial alliances - for Clean Hydrogen, Batteries, Circular Plastics, Raw Materials
- Introduce the circular economy



## 4) Sustainable and Smart Mobility

- Emissions from the transport sector will be reduced by 90% by 2050
- Twice as many loads and people will be moved to the railway
- Promotion of alternative fuels in transport



## 5) Improving the energy efficiency of buildings

- The aim is to reduce the consumption of energy and materials that buildings require
- The EU wants to launch a renovation wave, with the aim of renovating 35 million homes



## 6) Ecosystem protection and biodiversity restoration

- The aim is to restore Europe's biodiversity by 2030
- Extend protected areas in the EU by an additional 30%
- Plant 3 billion new trees by 2030



## 7) Pollution elimination

- The goal is zero air, water and soil pollution by 2050
- It also includes the area of chemicals

# Green Deal – existing tools



EU Emissions Trading System



Reducing emissions in sectors out of • (Effort Sharing Regulation)



National energy and climate plans



Energy efficiency directive, Directive on the energy performance of buildings



CO<sub>2</sub> emission performance standards for cars and vans



Fuel Quality Directive



Regulations improving the protection and management of land and forests



# Green Deal – "Fit for 55" proposals under existing tools



Faster reduction of emission allowances (by 4.2% per year instead of 2.2%), reduction of their cap

The end of free allowances for aviation by 2027. inclusion of maritime transport



More ambitious goals in Effort Sharing (for the CR - reduce emissions by 26% by 2030 instead of the current 14%)

Tighter regulation (energy savings in buildings, RES, Ecodesign, energy labels)



EU target of producing 40% of energy from RES in 2030 (now target of 32%)

Transport. industry. heating. buildings will also have specific RES targets (buildings – 49% of consumption)



Each Member State will have to reduce energy consumption by 1.5% per year in the period 2024-2030

The public sector will have to renovate 3% of the buildings each year



In 2030, new cars with average CO<sub>2</sub> emissions lower by 55% than in 2021 (originally -37.5%) will be allowed to be sold (and lower by 100% in 2035)

3.5 million charging stations in the EU by 2030



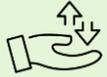
Renewable hydrogen and synthetic fuels are expected to account for 2.6% of fuels in 2030, and advanced biofuels for 2.2%



Sustainability criteria for the use of bioenergy (especially wood from forests) will be tightened

The goal is also to plant 3 billion trees in the EU by 2030

# New tools within "Fit for 55"



## 1) New emissions trading system for transport and buildings:

- It will apply to suppliers of fuels in transport and for buildings (not directly to final customers), the principle of "cap and trade"
- In operation from 2025, the emission cap will be set in 2026 (and reduced annually)
- The social aspect will be addressed by the Social Climate Fund, to which 25% of the revenues from the sale of these allowances should be directed



## 2) New rules of energy taxation

- Minimum tax rates will be set according to the impact of energy on the environment (in EUR/GJ)
- Current exemptions will be removed (zero taxation of kerosene, heavy oils)
- Low-income residents may be favored



## 3) Taxation of "carbon leakage" outside the EU since 2026 (Carbon Border Adjustment Mechanism)

- The aim is to take into account the production of energy-intensive products (iron and steel, cement, fertilizers, aluminum, electricity) outside the EU and their import into the EU market
- Importers to the EU will have to buy carbon certificates that correspond to the price of carbon if the product is made in the EU
- If the "carbon price" has already been demonstrably paid in non-EU countries, importers will be able to deduct it
- In the sectors covered by the CBAM, free allowances will be phased out completely after 2026



### Subsidies, financial instruments

in the amount of at least CZK 300 billion (EUR 12 bn) by 2030 for the Czech Republic



### Sustainable finance

# Sustainable finance in the EU



## 1) Requirements for financial institutions (EU regulation):

- Financial institutions must incorporate sustainability factors (ESG criteria) into their clients' risk assessment or portfolio management
- from 7/21 for newly provided loans
- from 7/22 for all expositions
- The obligation to measure and probably to reduce the carbon footprint of funded assets
- + Green bonds / loans

## 2) Proposal for a Corporate Sustainability Reporting Directive:

- The aim is to ensure uniform ESG reporting of companies (as financial reporting today)
- Today for companies listed on the stock exchange or with more than 500 employees
- In the future, for companies with at least 250 employees or a balance sheet total of over CZK 500 m or a net turnover of over CZK 1 bn
- Reporting standard, audit obligation

## 3) EU Taxonomy:

- A regulatory classification system that helps determine whether an economic activity is environmentally sustainable
  - 6 objectives:
    - Climate change mitigation
    - Climate change adaptation
    - The sustainable use and protection of water and marine resources
    - The transition to a circular economy
    - Pollution prevention and control
    - The protection and restoration of biodiversity and ecosystems
  - The activity must:
    - Significantly contribute to at least one objective
    - Do no significant harm to any of the other objectives
- Qualifies for green funding, may be required for subsidies, will enter to non-financial reporting

## Example: EU Taxonomy and automotive

What economic activities in the automotive industry qualifies as contributing substantially to climate change mitigation?

**Activity contributing  
to climate change  
mitigation**

**Substantial contribution to climate change mitigation**

Manufacture of low  
carbon technologies  
for transport

This economic activity consists of the manufacture, repair, maintenance, retrofitting, repurposing and upgrade of::

**f) vehicles of category M1 (passenger cars) and N1 (light-duty vehicles) with:**

- **until 31 December 2025 specific emissions of CO<sub>2</sub> lower than 50 g CO<sub>2</sub>/km (low- and zero-emission light-duty vehicles);**
- **from 1 January 2026 specific emissions of CO<sub>2</sub> are zero.**

# Overview of low-emission vehicle incentives in the EU and UK (as at June 2020)

Activity	Type of incentive	Countries where it was used in 2020
Purchase of a car	Reduced value added tax on the purchase of emission-free vehicles	Austria. Germany (temporarily) and Portugal
	Exemption or tax reduction relating to the purchase of a zero/low-emission vehicle	Austria. Belgium. Croatia. Cyprus. Denmark. Finland. French regions. Greece. Hungary. Ireland. Latvia. the Netherlands. Poland and the UK
	Exemption from or reduction of the registration fee for low-emission vehicles	Czech Republic. Denmark and Malta
	Financial contribution towards purchase (or lease) of a zero-emission vehicle (BEV or hydrogen) – usually with a maximum purchase price limit	Austria. Croatia (until the budget is exhausted). Estonia. Finland. France. Germany. Hungary. Ireland. Netherlands. Poland. Portugal (different amounts for individuals and companies). Romania. Slovakia. Slovenia. Sweden and the UK
	Financial contribution towards purchase of a plug-in hybrid vehicle – usually a maximum purchase price limit and maximum CO <sub>2</sub> emissions limit	Austria. Croatia (until the budget is exhausted). Germany. Ireland. Romania. Slovakia. Slovenia and Sweden
	Scrappage allowance for the purchase of a low-emission vehicle (up to the maximum price of the car)	France. Greece (15% cashback, but maximum incentive). Romania (additional subsidy over and above the financial contribution for the purchase of a low-emission vehicle). Spain (the amount of the subsidy depends on whether the old car is scrapped)
	Financial contribution towards purchase of a low-emission taxi	Greece (25% cashback and scrappage allowance) and the Netherlands
	Bonus-penalty scheme (bonus for buying a low-emission vehicle (<70 g of CO <sub>2</sub> /km) and, conversely, additional payment for cars emitting more than 250 g of CO <sub>2</sub> /km)	Italy
	Financial contribution towards purchase of a low-emission vehicle as a deductible item in the tax return	Luxembourg
Exemption from a “special tax” for cars emitting up to 120 g of CO <sub>2</sub> /km	Spain	
Car ownership	Exemption or tax reduction relating to operation of a low/zero-emission vehicle	Austria. Belgium. Bulgaria. Cyprus. Czech Republic. Finland. Germany (10-year deferral). Greece. Hungary. Ireland. Italy (five-year exemption). Latvia. Luxembourg. Malta. the Netherlands. Portugal. Romania. Slovenia. Slovakia (for 2 years). Spain (for some cities). Sweden and the UK
	Exemption from environmental tax for electric vehicles	Croatia
	Exemption from the obligation to buy a vignette for low-emission vehicles	Czech Republic
Corporate fleets	Exemption or tax reduction relating to operation of an emission-free vehicle for companies	Austria. France. Germany. Greece. Hungary. Latvia (minimum rate). Luxembourg. the Netherlands. Slovenia. Sweden and the UK (minimum rate)
	Corporate tax deductible (for vehicles emitting up to 50 g of CO <sub>2</sub> /km)	Belgium. Denmark. Greece and Portugal
	Accelerated depreciation for emission-free vehicles	Netherlands
	Subsidy for purchase of low-emission vehicles by the corporate sector	Czech Republic
	Subsidy for purchase of low-emission vehicles by transport companies	Czech Republic

# Electromobility targets of selected car manufacturers (published from the 2<sup>nd</sup> half of 2020)

Car manufacturer	Target	Description
<b>VW</b>	Carbon neutrality by 2050	The entire group plans to launch 70 battery electric and 60 hybrid vehicles by 2030. It aims to become the global leader in the electric vehicle market in 2025, with electric vehicles accounting for 20–25% of total sales in that year. It also plans to have six battery factories in Europe by 2030. VW will also introduce a standardised proprietary battery cell type by 2023. This should reduce battery costs in basic models by up to 50%. By 2050, the entire group should be carbon neutral (cars, processes and factories)
<b>BMW</b>	Increase the share of electric vehicles sold by 2030 to 50%.	The car manufacturer wants to have six battery electric vehicle models by 2023. The company has previously stated that by 2023, one-fifth of the cars sold will be alternatively powered. The Mini brand will be fully electric by 2030.
<b>Daimler</b>	Carbon neutrality by 2039	Mercedes-Benz passenger cars and commercial vehicles aim to become carbon neutral by 2039. This means having carbon-neutral production in the company's own factories from 2022. Plug-in hybrids and battery electric vehicles will account for more than 50% of the portfolio in 2030.
<b>PSA</b>	By 2025, all models will be electrified	By 2021, 15 electrified models will be launched, and by 2025 the Group will offer an electric version of each of its models.
<b>Renault</b>	Half of new models to be battery electric vehicles by 2025	The company has committed to making half of its new models battery electric vehicles by 2025. By then, hybrid technologies are expected to account for 35% of total sales, with BEVs accounting for 30%. The company will also unveil 7 electric models by 2025.
<b>Volvo</b>	Only battery electric vehicles by 2030	The Swedish car manufacturer Volvo Cars wants to sell only electric vehicles by 2030. By 2025, 50% of cars sold should be battery electric vehicles. The car manufacturer also announced that it will invest 5% of its annual revenues in the transition to electromobility.
<b>Jaguar Land Rover</b>	Only battery electric vehicles by 2030	All vehicles made by the British car manufacturer Jaguar Land Rover will be battery electric vehicles by 2030, according to the company. Jaguar cars themselves should be electric by 2025. The British car manufacturer wants to achieve zero carbon emissions in its supply chain, operations and products by 2039.
<b>Ford</b>	All cars for the European market will be electric by 2030	The US car manufacturer has announced that by 2030, all cars destined for the European market will be electric. The company has also said that it will have electric versions of all its passenger cars for the European market by 2026. By 2030, two-thirds of Ford commercial vehicles for Europe will be battery electric vehicles or plug-in hybrids. Ford has entered into a strategic alliance with VW to use the company's MEB platform to build its electric vehicles.
<b>FCA</b>	Platform for electromobility	The strategy of the FCA Group is to build a platform for the development of electromobility. This includes not only development of the electrified model range and the associated investment of € 9 billion, but also investments in charging, the electricity network, power generation, connectivity and safety.
<b>Toyota</b>	By 2025, the entire model range will be electrified.	The Japanese car manufacturer aims to have an electric version of all Toyota and Lexus models by 2025. The long-term strategy is to reduce CO <sub>2</sub> emissions in company operations, products and production (including logistics, suppliers and final sales) by 2050, to reduce the amount of water used in production by 3% compared to 2020 and to reduce the amount of plastic packaging by 25% compared to 2018.
<b>Hyundai</b>	Sell 1 million electric vehicles in 2025	The company, which includes the Hyundai and Kia brands, aims to sell 1 million electric vehicles worldwide by 2025 and gain a 10% share of the electric vehicle market.
<b>Honda</b>	End of sales of cars powered only by a combustion engine in 2022	The car manufacturer's portfolio for the European market will consist mainly of hybrid, plug-in hybrid and electric vehicles from 2022.
<b>General Motors</b>	End of sales of cars powered by an internal combustion engine by 2035	Cars powered by an internal combustion engine will be replaced by electric vehicles. The car manufacturer's goal is to become carbon neutral by 2040 (not only in terms of cars, but also in terms of production)
<b>Bentley</b>	Electric drive by 2030	The British luxury car brand, which is part of the VW group, intends to have its entire model range running on electric power by 2030. By 2026, the entire model portfolio will be either battery electric vehicles or plug-in hybrids.
<b>Uber</b>	Uber wants to offer solely electric vehicles in 10 years	Uber Technologies, an American alternative taxi company, wants to have only electric vehicles in its fleet by 2040. And by 2030, it plans to offer travel in the US, Canada and Europe exclusively in electric vehicles via its app.



# The development of electromobility

# Automotive emission regulation:

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1. Levels of EURO standard
2. WLTP
3. CO<sub>2</sub> emission limits
4. Support of electric charging infrastructure

# History and levels of Euro standards for passenger cars:

## Petrol (g/km)

Euro standard	New approvals	CO	Nox	HC	HC + NOx
EURO 1	1992	3.16	x	x	1.13
EURO 2	1996	2.20	x	x	0.50
EURO 3	2000	2.30	0.15	0.20	x
EURO 4	2005	1.00	0.08	0.10	x
EURO 5	2009	1.00	0.06	0.10	x
EURO 6	2014	1.00	0.06	0.10	x

- All vehicles on European roads must have a Euro emissions rating which reports the results of tests carried out by vehicle makers to simulate the levels of harmful emissions produced in certain driving conditions.
- Euro 7 is expected to be implemented in 2025.

## Diesel (g/km)

Euro standard	New approvals	CO	NOx	Solid particles	HC + NOx
EURO 1	1992	3.16	x	0.18	1.13
EURO 2	1996	1.00	x	0.08	0.70
EURO 3	2000	0.64	0.50	0.05	0.56
EURO 4	2005	0.50	0.25	0.025	0.30
EURO 5	2009	0.50	0.18	0.005	0.23
EURO 6	2014	0.50	0.08	0.005	0.17

Source: REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

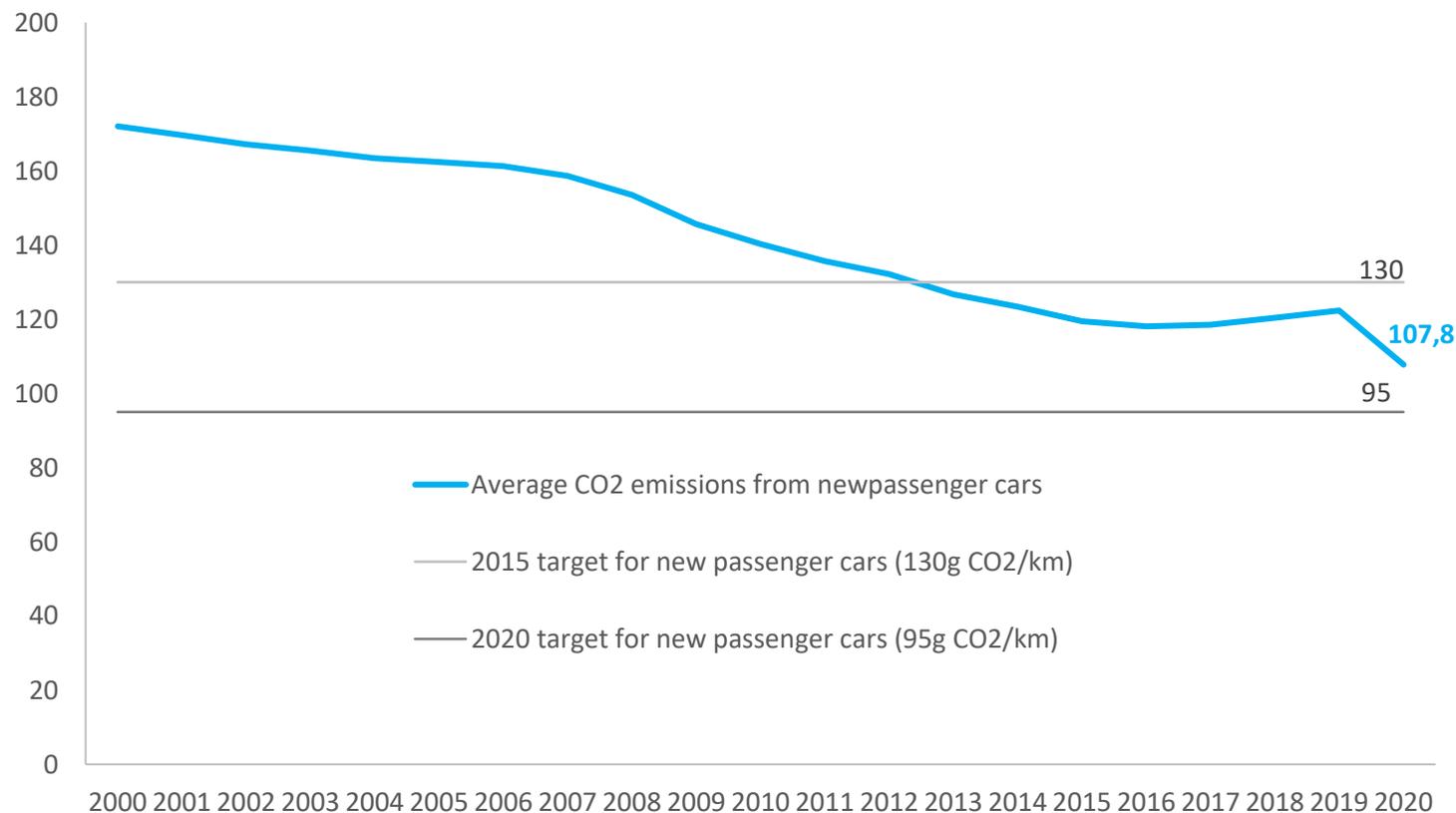
# The new laboratory test for measuring fuel consumption and emissions from cars

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- The old lab test – called the New European Driving Cycle (NEDC) – was designed in the 1980s. Due to evolutions in technology and driving conditions it became outdated. The European Union has therefore developed a new test, called the **Worldwide Harmonized Light Vehicle Test Procedure (WLTP)**.
- WLTP was developed with the aim of being used as a global test cycle across different world regions. So, pollutant and CO<sub>2</sub> emissions as well as fuel consumption values would be comparable worldwide.
- From September 2018: All new cars must be certified according to the WLTP test procedure and no longer on NEDC.
- WLTP introduced much more realistic testing conditions. These include:
  - ✓ More realistic driving behavior;
  - ✓ A greater range of driving situations (urban. suburban. main road. motorway);
  - ✓ Longer test distances;
  - ✓ More realistic ambient temperatures. closer to the European average;
  - ✓ Higher average and maximum speeds;
  - ✓ More dynamic and representative accelerations and decelerations;
  - ✓ ...

# CO<sub>2</sub> emissions from new passenger cars

Average carbon dioxide emissions from new passenger cars (g CO<sub>2</sub>/km)

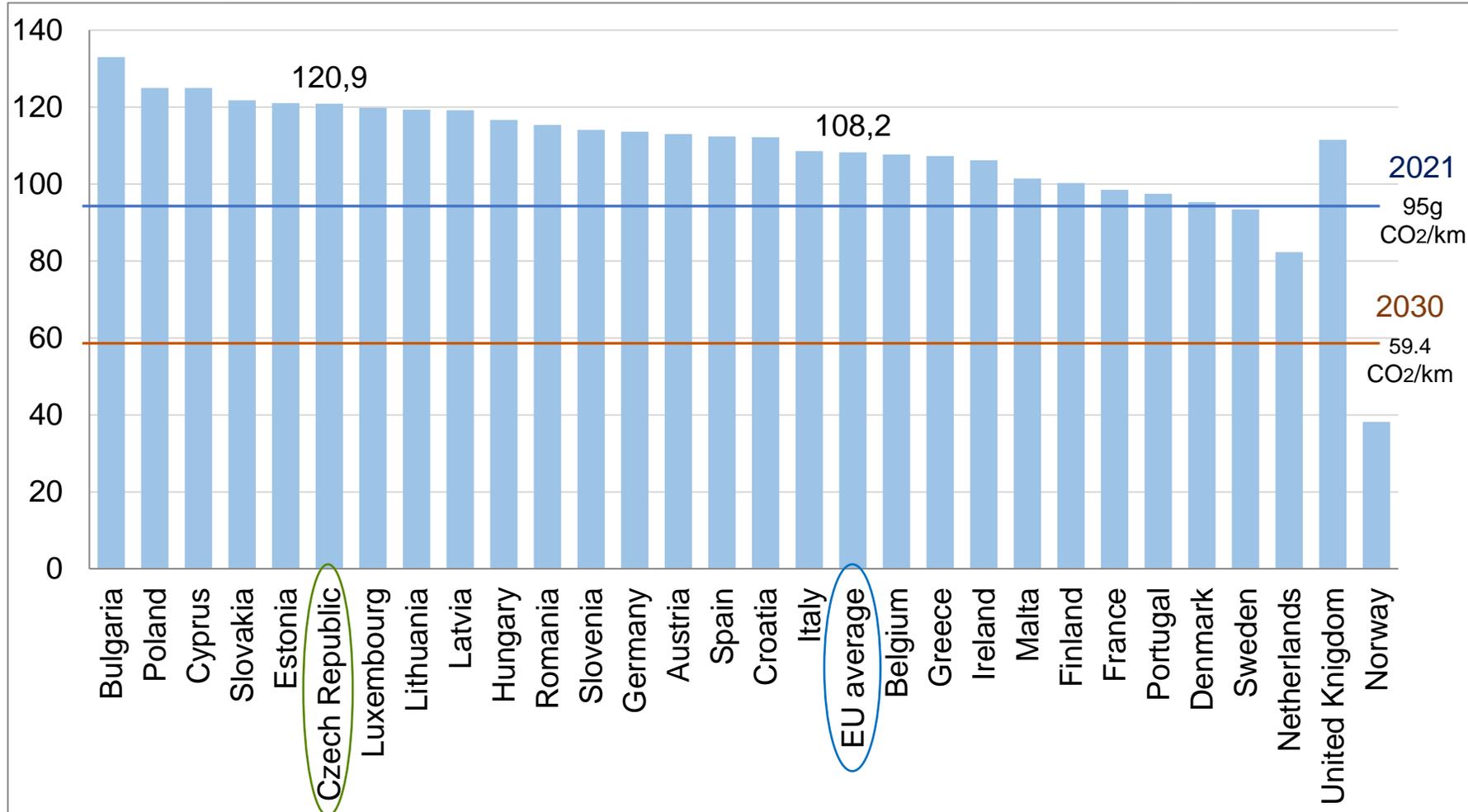


Source: The European Environment Agency; EU27, Island, Norway and United Kingdom

- Tightening CO<sub>2</sub> emission limits
- Below the EU fleet-wide target of 130 g CO<sub>2</sub>/km set for the period 2015-2019. but above the 2021 target of 95 g CO<sub>2</sub>/km. phased-in in 2020

# Emissions have fallen. It's still not enough...

Average CO<sub>2</sub> emissions of new passenger cars by country (2020; g CO<sub>2</sub>/km)



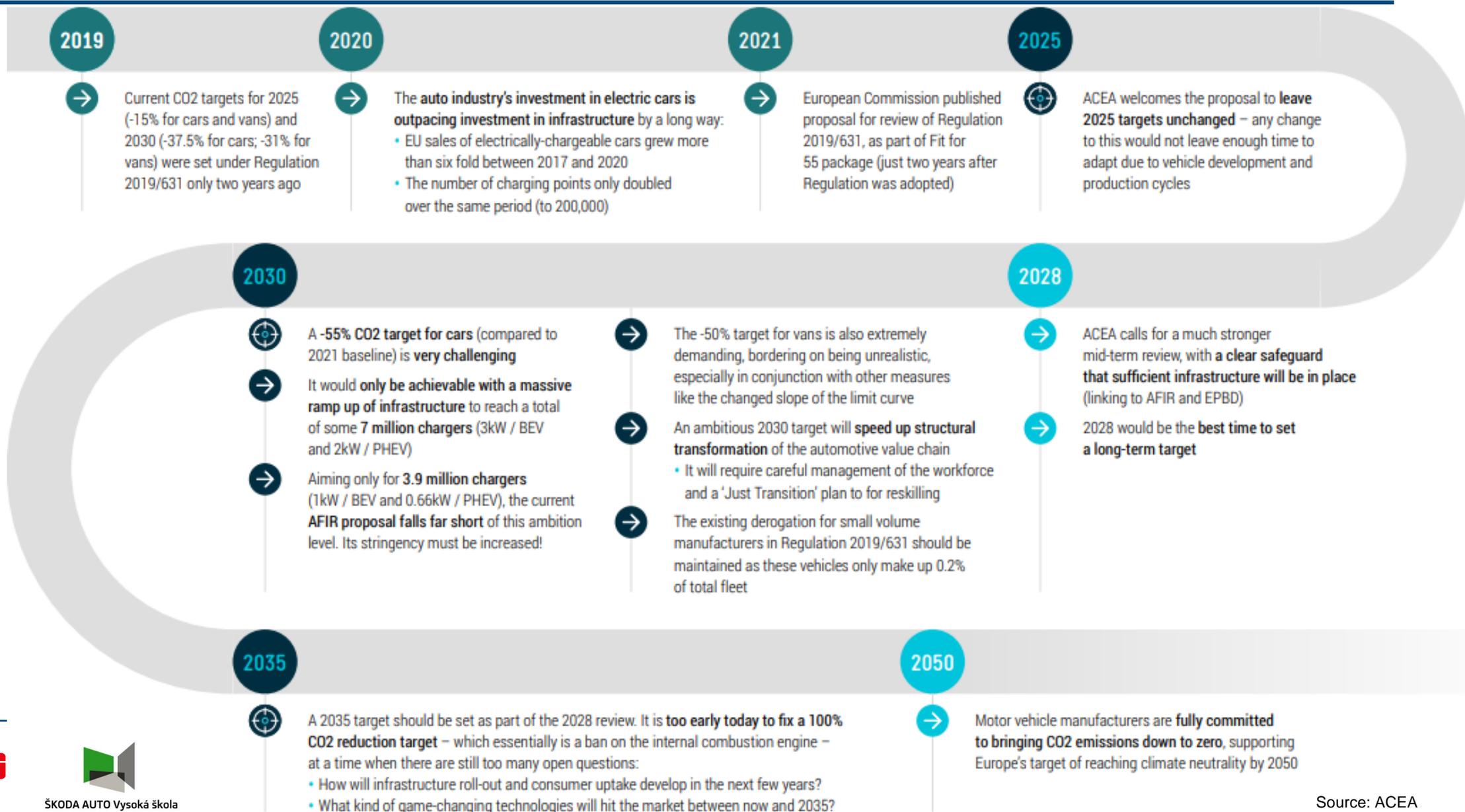
- Regulation (EU) 2019/631 sets targets for the EU fleet-wide average CO<sub>2</sub> emissions of new passenger cars.
- In 2020, average new car emissions were 108.2g CO<sub>2</sub>/km, a 22.4% decrease since 2010.
- The current CO<sub>2</sub> emissions standard for passenger cars is 95 g/km, phased in for 95% of vehicles in 2020, with 100 % compliance from 2021.
- An excess emissions premium of €95 per g/km of target exceedance.

# Green Deal „Fit for 55“ for automotive

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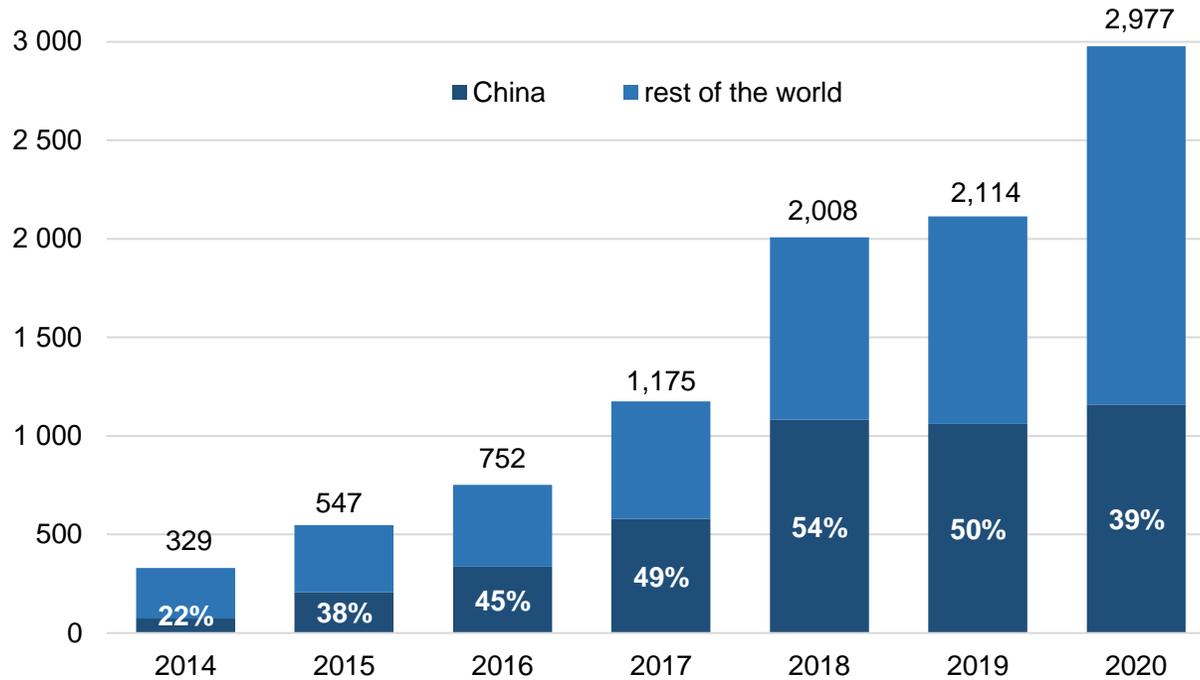
- **Stronger CO<sub>2</sub> emissions standards for cars** and vans will accelerate the transition to zero-emission mobility by requiring average emissions of new cars to **come down by 55% from 2030 and 100% from 2035 compared to 2021 levels**. As a result, all new cars registered as of 2035 will be zero-emission.
- Infrastructure Regulation will require Member States **to expand charging capacity** in line with zero-emission car sales and to install charging and fueling points at regular intervals on major highways: every 60 kilometers for electric charging.
- The rollout of electric charging infrastructure needs to accelerate commensurate to the expected electric vehicle fleet on EU roads, which by 2030 is projected to reach at least 30 million cars. In the Sustainable and Smart Mobility Strategy of the Commission: it is expected to **deliver more than 1 million recharging points by 2025 and approximately 3.5 million by 2030**.

# The Road to Carbon Neutrality (CO<sub>2</sub> Targets)



# Electric vehicle sales worldwide

Electric vehicle sales worldwide (in thousands)



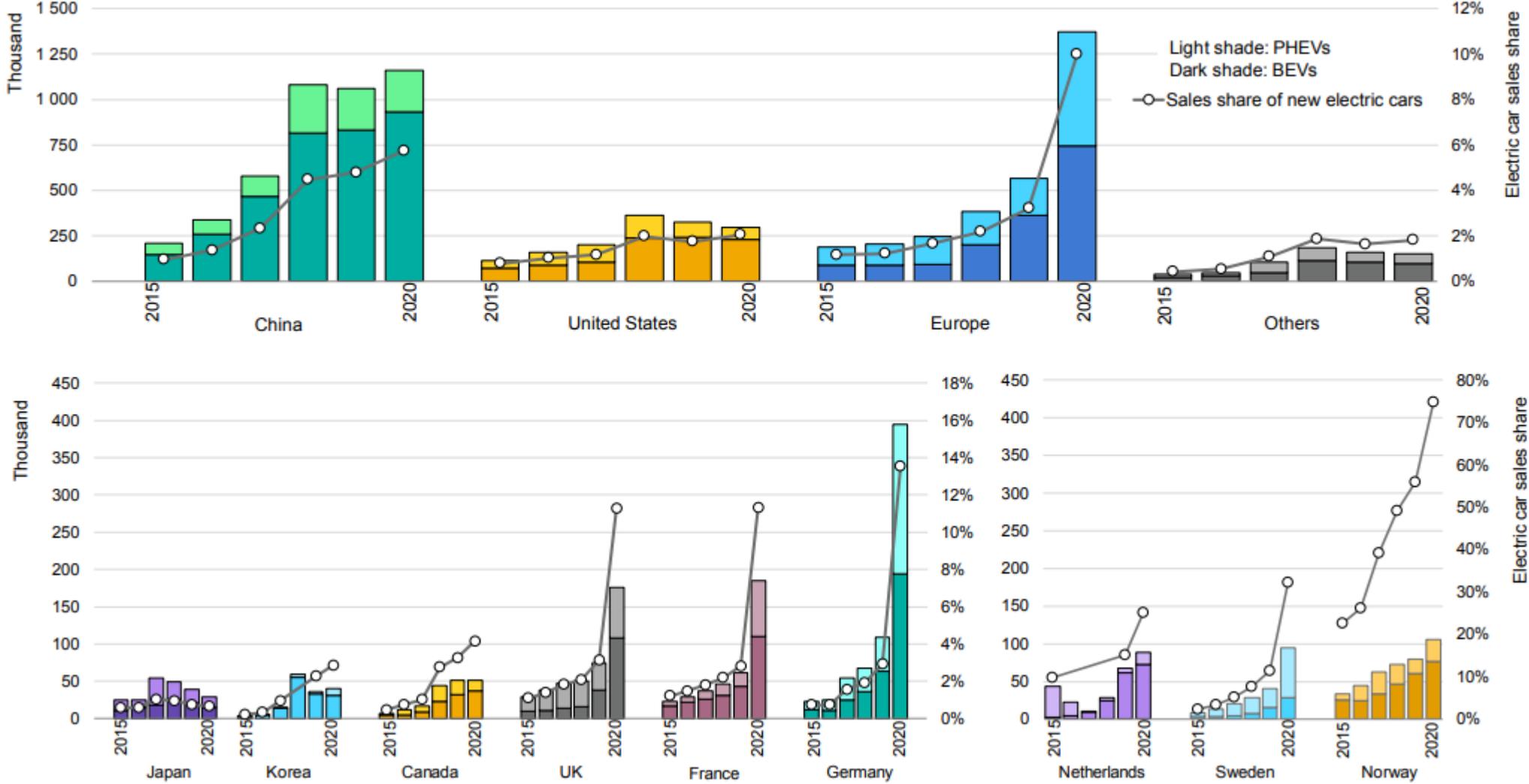
Source: IEA; EVs refers to all electric vehicles (BEVs + PHEVs); China's share of world sales

Electric vehicle sales outlook (in thousands of units)

	2020	2025*	2030*
<b>World</b>	<b>2,977</b>	<b>11,341</b>	<b>22,132</b>
<b>China</b>	1,160	4,548	8,937
<b>Europe</b>	1,380	3,270	5,889
<b>China's Share of Global EV Sales</b>	39.0%	40.1%	40.4%
<b>China: Share of EV Sales in Total Domestic Car Sales</b>	5.7%	20.1%	33.8%
<b>World: Share of EV Sales in Total Worldwide Car Sales</b>	4.6%	10.4%	17.3%

Source: IEA; EVs refers to all electric vehicles (BEVs + PHEVs); STEPS scenario; \* forecast

# Electric car registrations and sales share increased despite the Covid



Source: IEA; PHEV = plug-in hybrid electric vehicle; BEV = battery electric vehicle. The selected countries and regions are the largest EV markets and are ordered by size of the total car market in the upper half of the figure and by sales share of electric cars in the lower half.

# Registrations of new fully electric passenger cars (BEV; in thousands)

Country	2019	2020	2021	change 2019/2020	change 2020/2021
<b>EU27</b>	<b>247.9</b>	<b>538.8</b>	<b>878.4</b>	<b>+117.4%</b>	<b>+63.1%</b>
Germany	63.5	194.5	365.4	+206.3%	+83.3%
France	42.8	111.1	162.2	+159.5%	+45.9%
Italy	10.7	32.5	67.3	+204.0%	+107.0%
Netherlands	61.7	73.2	64.1	+18.6%	-12.1%
Sweden	15.6	28.0	57.5	+79.3%	+105.5%
Austria	9.3	16.0	33.4	+72.6%	+108.8%
Spain	10.0	17.9	23.7	+78.5%	+32.1%
Denmark	5.5	14.3	25.0	+158.2%	+75.1%
Belgium	8.8	15.0	22.7	+69.7%	+51.2%
Portugal	6.9	7.8	13.7	+13.8%	+69.3%
Finland	1.9	4.2	10.2	+123.7%	+139.2
Ireland	3.4	4.0	8.6	+16.5%	+115.4%
Poland	1.5	3.7	7.2	+147.0%	+94.7%
Romania	1.5	2.8	6.3	+88.4%	+122.9
Luxembourg	1.0	2.5	4.7	+150.8%	+88.0%
Hungary	1.8	3.0	4.3	+66.2%	+41.6%
<b>Czechia</b>	<b>0.8</b>	<b>3.3</b>	<b>2.7</b>	<b>+331.5%</b>	<b>-17.8%</b>
Greece	0.2	0.7	2.2	+257.4%	+220.5%
Slovenia	0.2	1.6	1.7	+785.5%	+4.6%
Slovakia	0.2	0.9	1.1	+456.4%	+20.4%
Lithuania	0.2	0.5	1.2	+179.6%	+155.0%
Estonia	0.1	0.4	0.5	+350.0%	+41.5%
<i>United Kingdom</i>	37.9	108.2	190.8	+185.9%	+76.3%

- Battery electric vehicles increased by (+63.1%) in 2021, going from 538.734 to 878.432 cars sold.

Source: ACEA;

# Registration of new plug-in hybrid passenger cars (PHEV; in thousands)

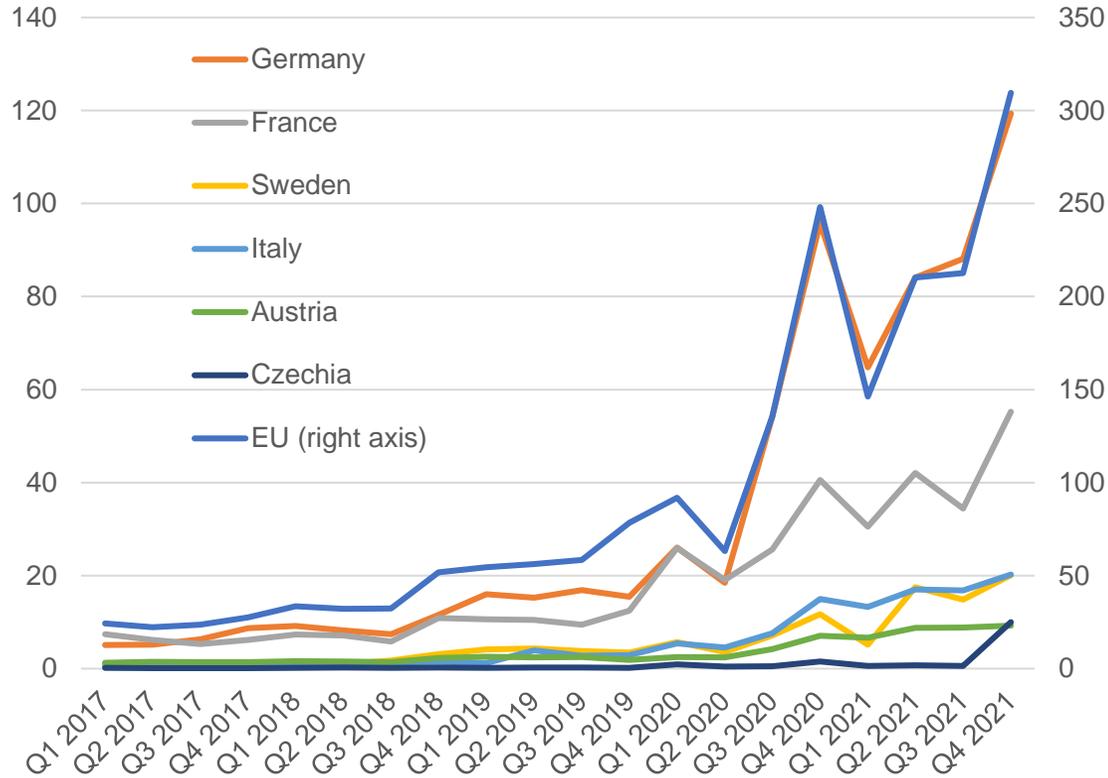
Country	2020	2021	change 2020/2021
<b>EU27</b>	<b>507.9</b>	<b>867.1</b>	<b>+70.7%</b>
Germany	200.5	325.4	+62.3%
France	74.6	141.0	+89.0%
Belgium	31.7	47.8	+50.7%
Italy	27.4	70.5	+157.1%
Spain	23.3	43.2	+85.4%
Denmark	18.2	40.5	+121.9%
Netherlands	14.9	31.0	+108.3%
Finland	13.2	20.1	+52.2%
Portugal	11.9	15.7	+32.0%
Austria	7.6	14.6	+91.4%
Poland	4.5	9.3	+105.7%
Hungary	3.0	4.2	+41.4%
Luxembourg	2.7	4.4	+65.5%
Ireland	2.5	7.9	+216.7%
<b>Czechia</b>	<b>2.0</b>	<b>3.9</b>	<b>+97.2%</b>
Greece	1.5	4.8	+228.6%
Romania <sup>2</sup>	1.0	2.6	+153.9%
Slovakia	0.9	1.2	+35.1%
Croatia	0.1	0.4	+179.0%
Cyprus	0.1	0.1	+16.9%
Estonia	0.1	0.2	+122.7%
Latvia	0.1	0.1	+97.3%
Bulgaria	0.0	0.1	+136.6%
Slovenia	0.0	0.2	+389.7%
Sweden	66.1	77.8	+17.8%
<i>United Kingdom</i>	67.1	114.6	+70.6%

- PHEV registrations increased by 70.7% from 507.917 units in 2020 to 867.092 last year.
- In 2020, the year-on-year increase in the EU was more than 260% (according to ACEA).
- Only the UK, now a non-EU country, saw a decline (-48%) in plug-in hybrid registrations between 2020 and 2019.

Source: ACEA

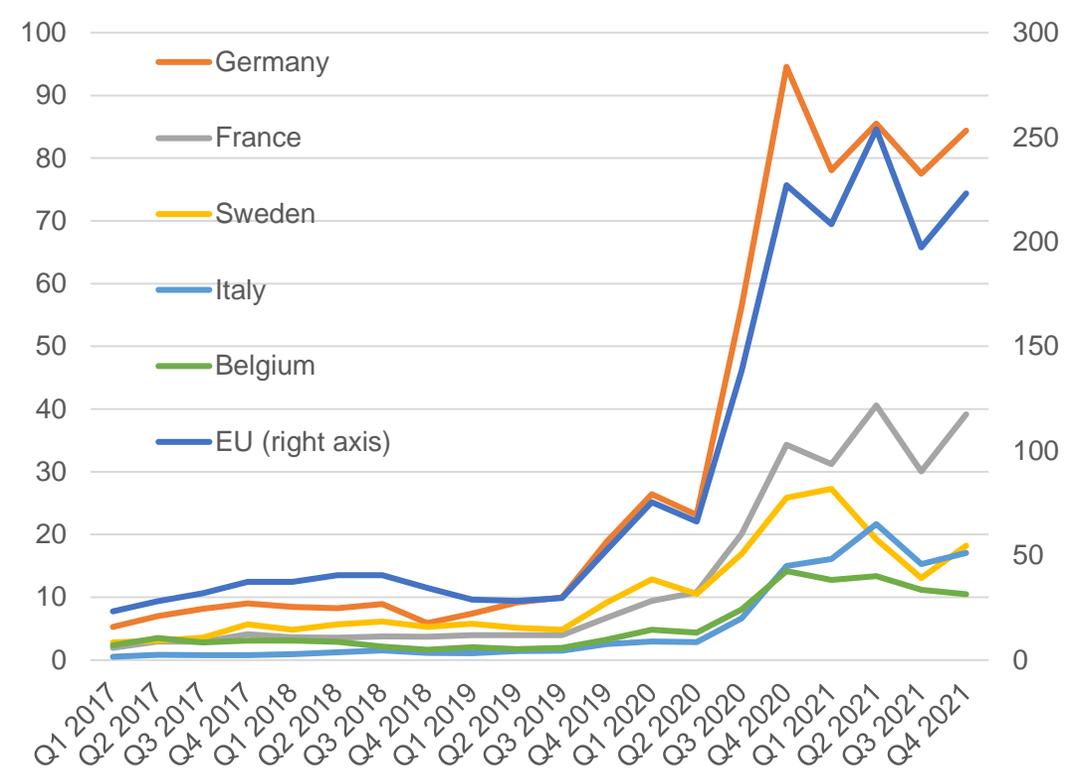
# Electric vehicles and plug-in hybrids saw a strong increase in sales

Quarterly registrations of new fully electric passenger cars (in thousands)



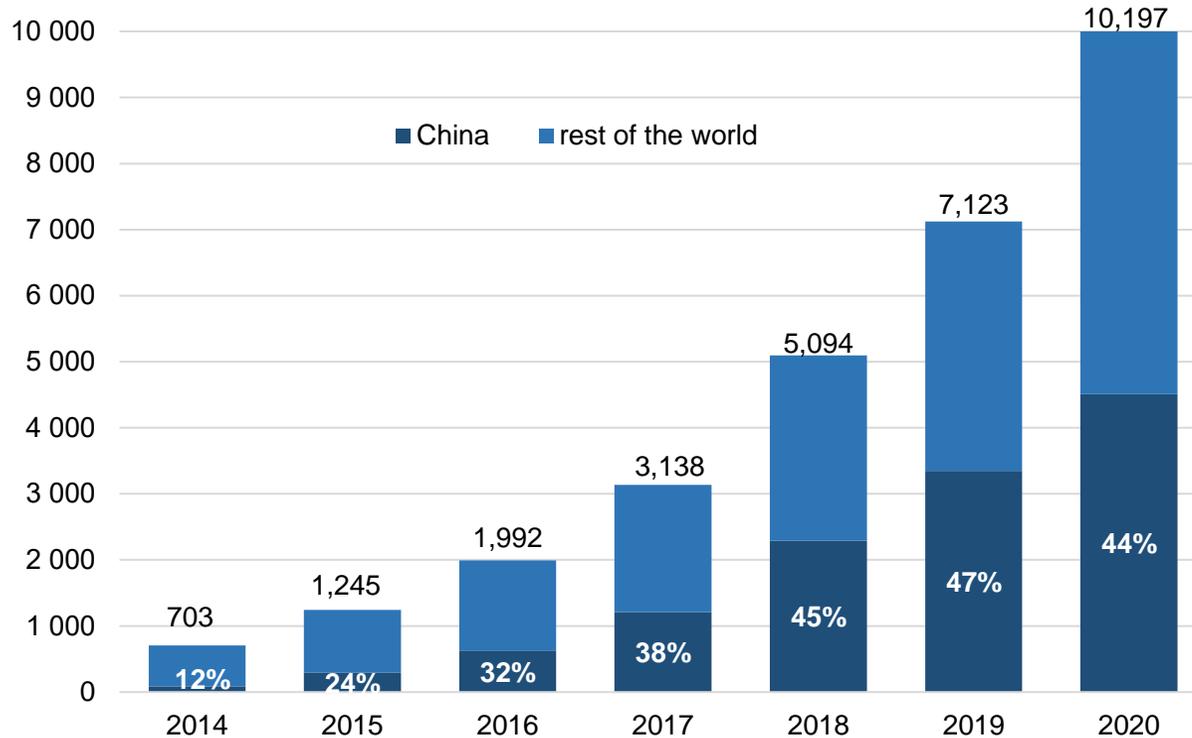
Source: ACEA

Quarterly registrations of new plug-in hybrids (in thousands)



# Electric vehicle stock worldwide

## Electric vehicle stock worldwide (in thousands)



Source: IEA; EVs refers to all electric vehicles (BEVs + PHEVs); China's share of world stock

## Electric vehicle stock forecast (in thousands of units)

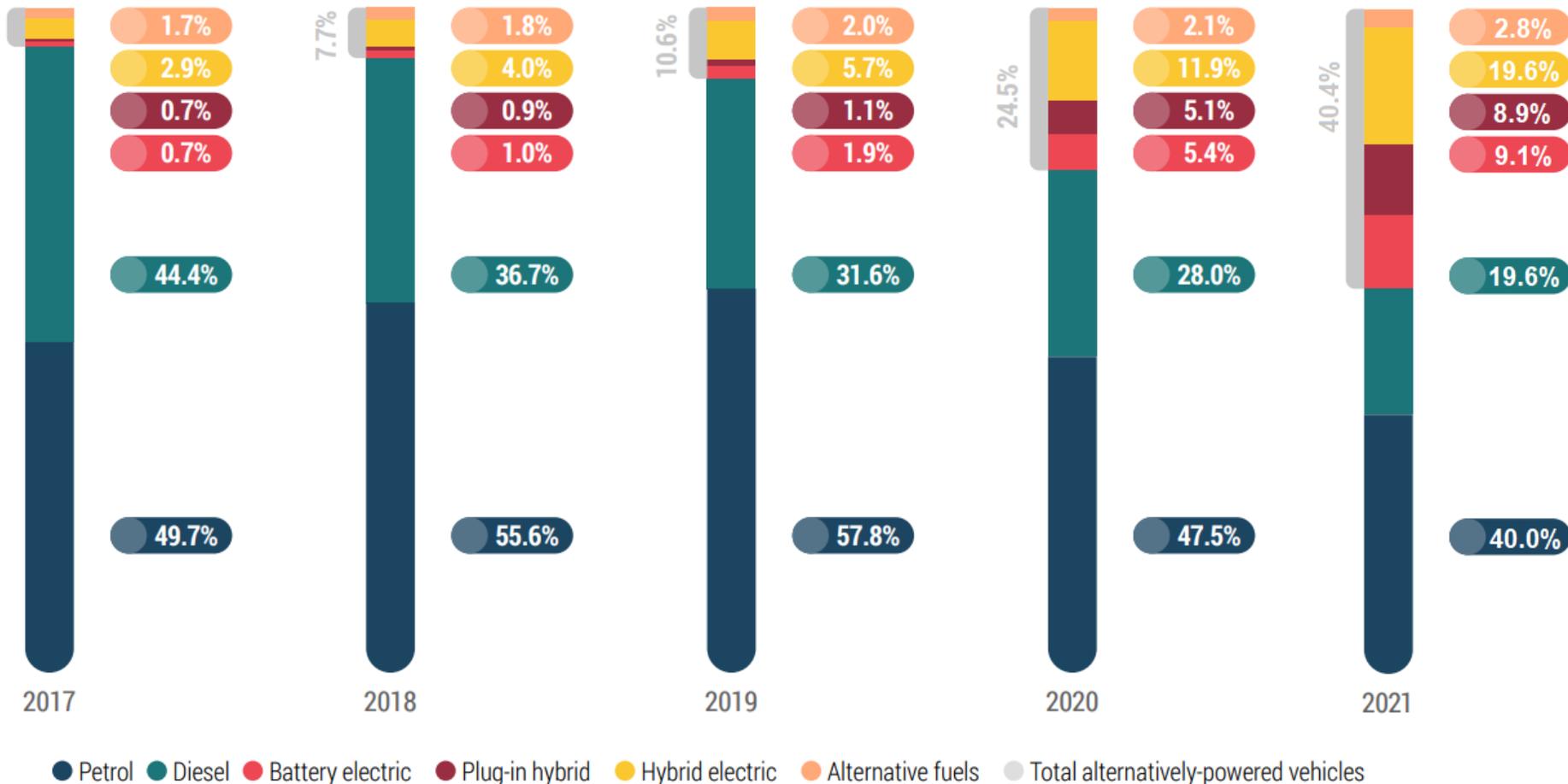
	2020	2025*	2030*
World	10,197	45,963	124,332
China	4,509	20,366	52,054
Europe	3,835	13,711	34,804
China: Share of World EV Stock	44.2%	44.3%	41.9%
China: Share of EVs in Domestic Stock of Cars	1.7%	6.2%	13.2%
World: Share of EVs in World Stock of Cars	0.9%	3.2%	7.5%

Source: IEA; EVs refers to all electric vehicles (BEVs + PHEVs); STEPS scenario; \* forecast

- In 2020 the number of EVs worldwide exceeded ten million, of which 4.5 million were in China, about 44% of the total.
- The number of EVs on the road in 2020 was not even 1 percent of the total number of passenger cars in the world, which was approaching 1.1 billion.

# Electrically-chargeable vehicles: a strong increase in sales in 2021

New Cars in the EU by Fuel Type (Market Share)



- Alternatively-powered vehicles (battery electric, plug-in hybrid, hybrid and alternative fuels) together represent 40.4% of new car sales in the EU (in 2021).

Source: ACEA

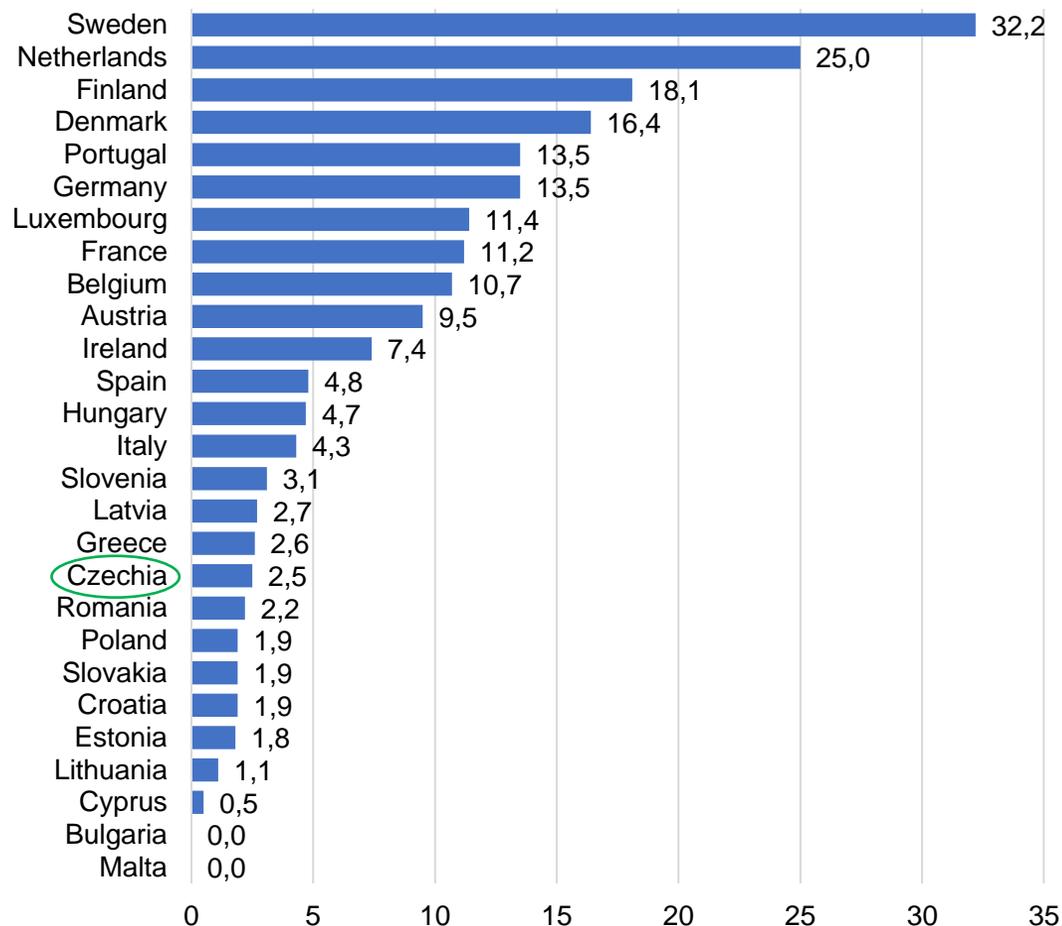
# Share of passenger cars in use by fuel in the EU in 2020

Country	Battery electric	Plug-in hybrid	Country	Battery electric	Plug-in hybrid
EU	<b>0.5%</b>	<b>0.6%</b>	Slovenia	0.3%	0.0%
Denmark	1.2%	1.1%	Estonia	0.2%	0.0%
Sweden	1.1%	2.5%	Latvia	0.2%	0.0%
Luxembourg	1.0%	1.1%	Lithuania	0.2%	0.0%
Austria	0.9%	0.0%	Spain	0.2%	0.2%
France	0.6%	0.4%	Italy	0.1%	1.4%
Ireland	0.6%	0.6%	Slovakia	0.1%	0.1%
Germany	0.6%	0.6%	Croatia	0.1%	0.0%
Belgium	0.5%	1.2%	Czechia	<b>0.1%</b>	<b>0.1%</b>
Portugal	0.5%	0.6%	Poland	0.1%	0.0%
Finland	0.4%	1.7%	Greece	0.0%	0.0%
Hungary	0.3%	0.3%	UK	0.5%	0.6%

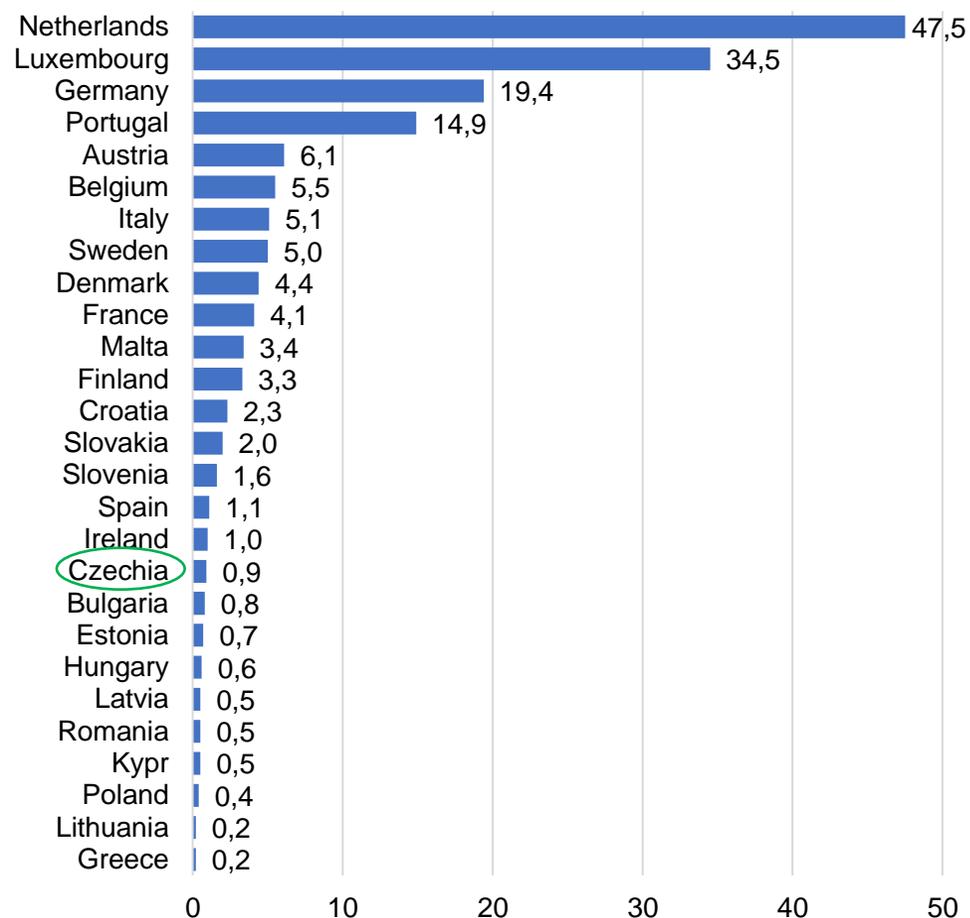
Source: ACEA data; own elaboration; battery electric – battery electric vehicles; UK – United Kingdom

# Serious lack of electric charging points along the road networks

Market share of electrically-chargeable cars (2020; %)



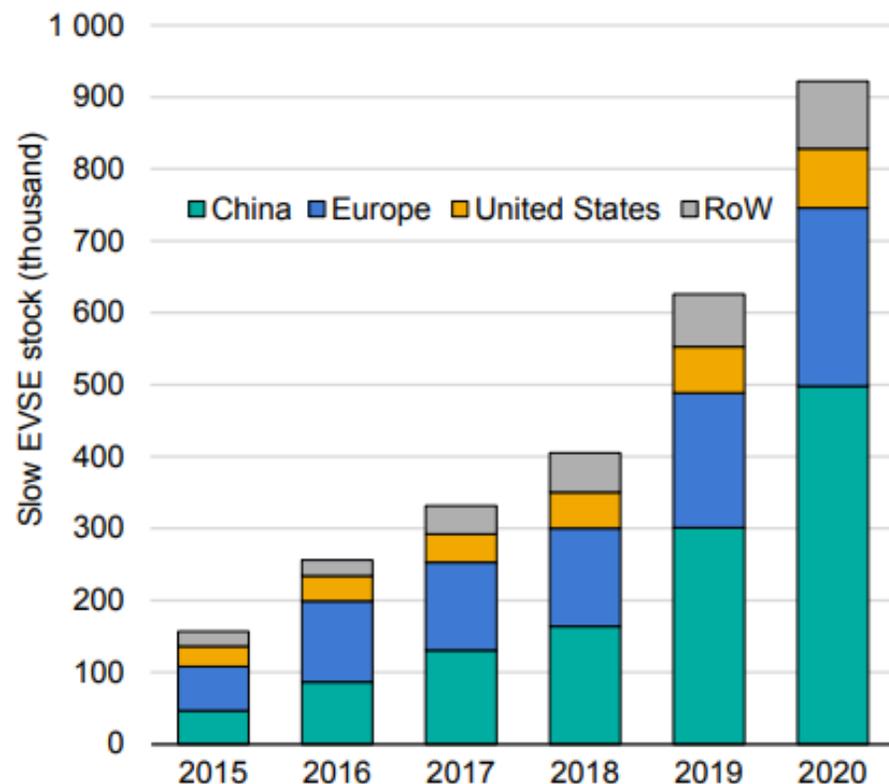
Electric cars charging points per 100km of road (2020)



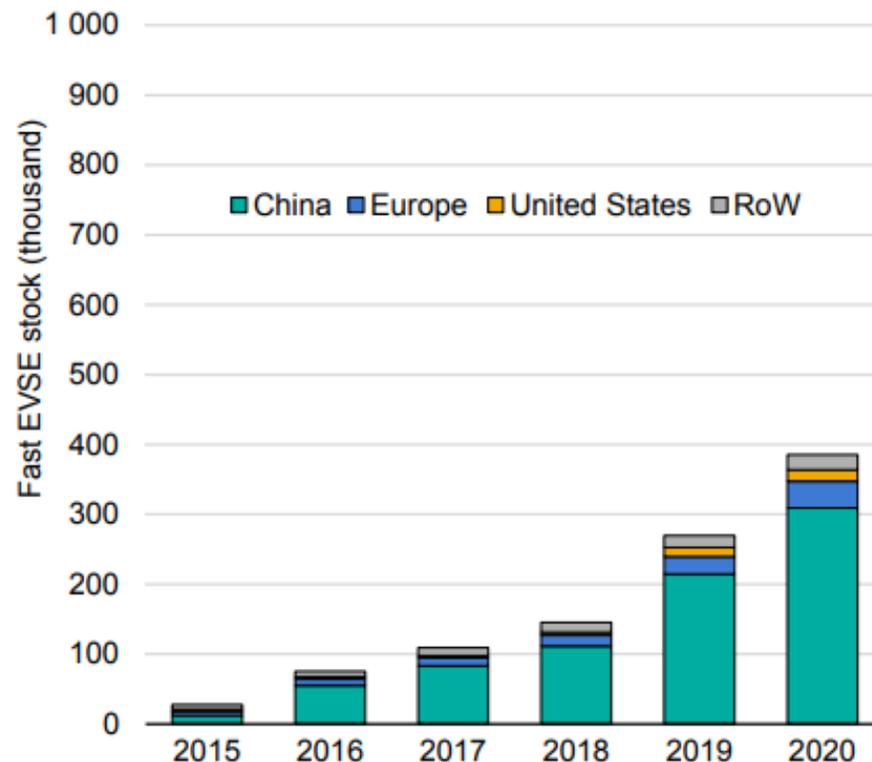
Source: ACEA; electrically-chargeable cars = battery electric vehicles (BEV) + plug-in hybrids (PHEV)

# Stock of slow and fast publicly accessible chargers for electric vehicles

## Slow chargers worldwide



## Fast chargers worldwide

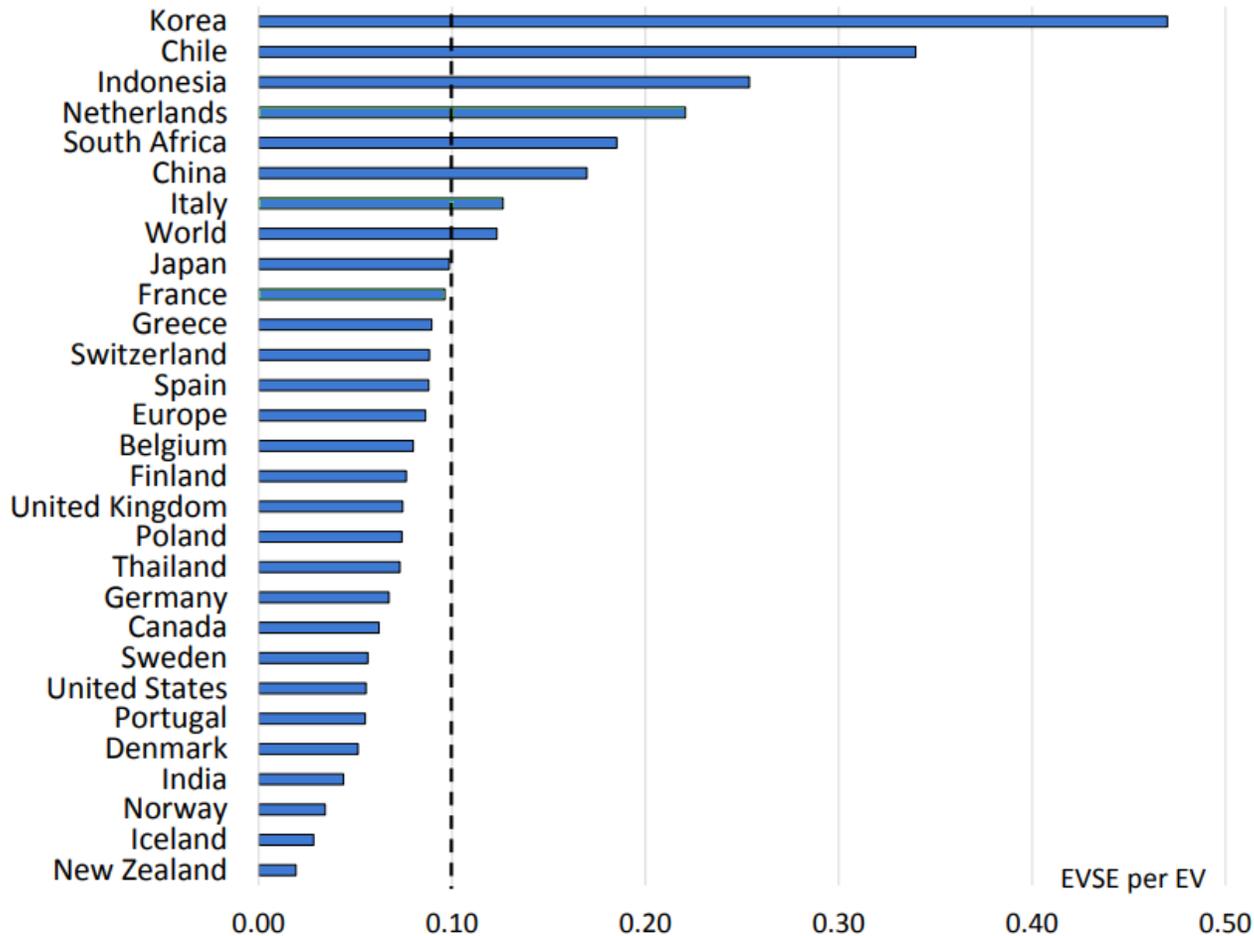


Publicly accessible slow and fast chargers increased to 1.3 million in 2020

Source: IEA; slow chargers have a charging power below 22 kW. while fast chargers provide more than 22 kW

# Most countries in Europe did not achieve 2020 AFID targets for publicly accessible chargers

Ratio of public chargers per EV stock by country, 2020



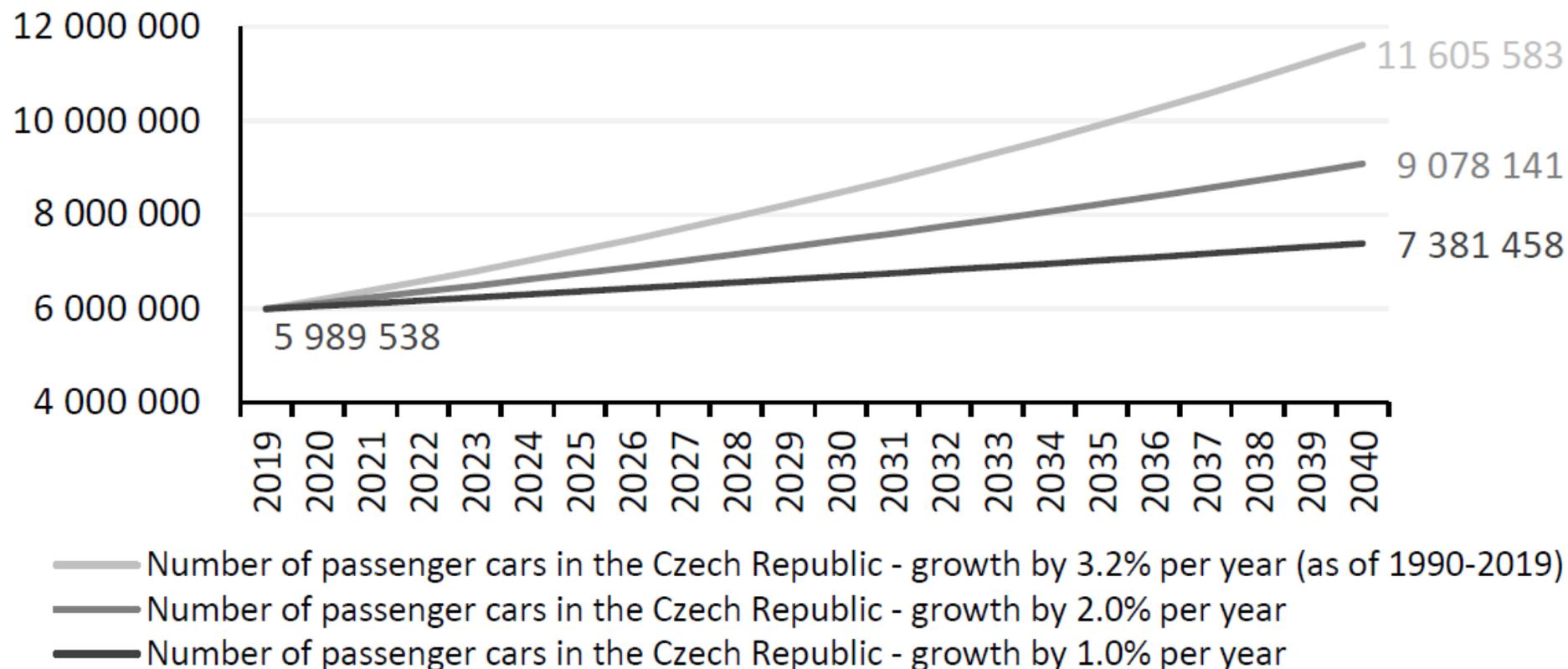
- The Alternative Fuels Infrastructure Directive (AFID) introduced the requirement for EU countries to develop national policy frameworks, the aim being to put in place enough refueling and recharging points for certain alternative fuel vehicles.
- While not setting mandatory targets, the directive suggested, as an indication, that the number of recharging points should be equivalent to at least one per 10 cars.
- In the European Union, the average public EVSE (electric vehicle supply equipment) per EV (electric vehicle) ratio was 0.09 at the end of 2020.

Source: IEA

# The Impact of the Development of Electric Mobility on Consumption of Electric Energy in the Czech Republic

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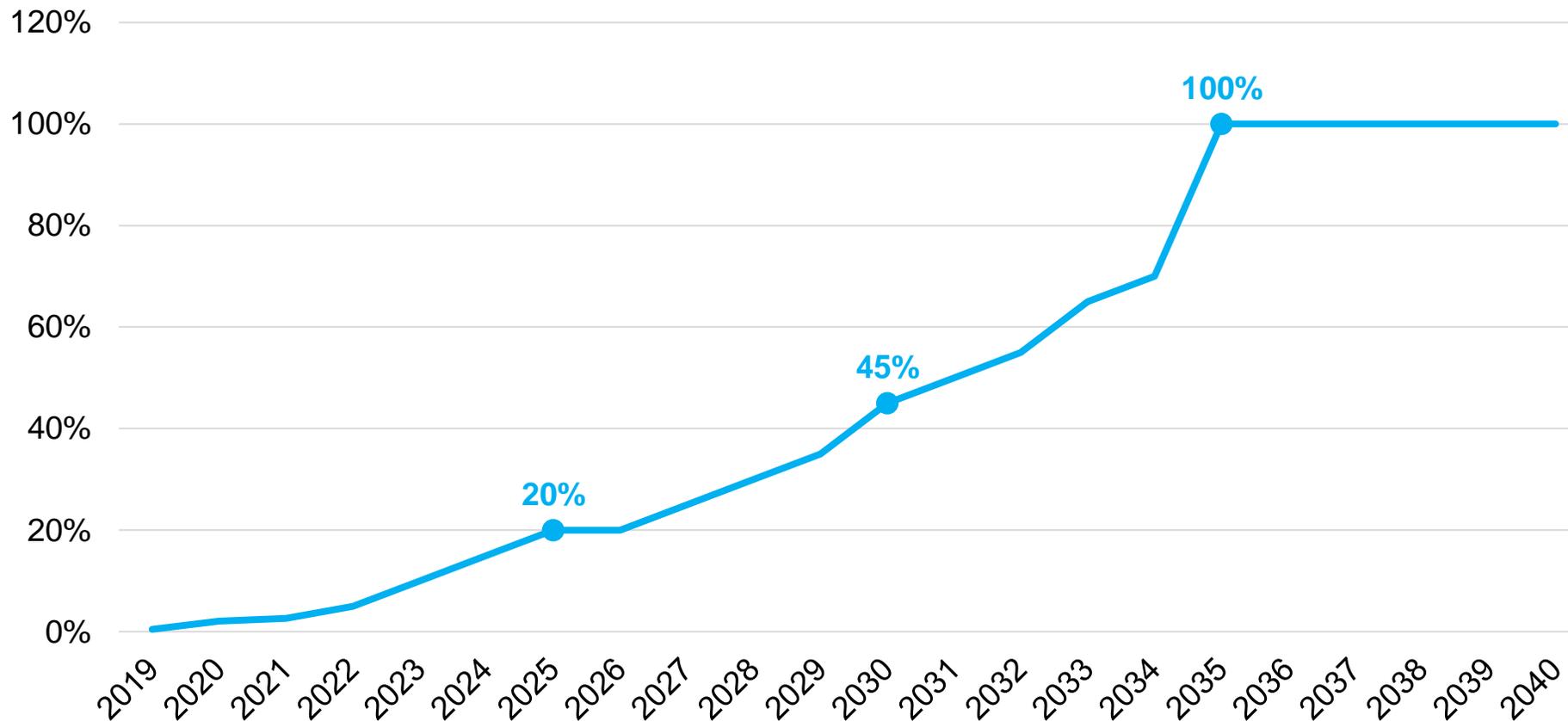
Outlook for the Development of the Number of Passenger Cars in Czechia (average growth)



Source: Own elaboration (2022)

# The Impact of the Development of Electric Mobility on Consumption of Electric Energy in the Czech Republic

**Estimate of the Development of the Share of New Electric Passenger Car Registrations in Total New Registrations of Passenger Cars in Czechia**



# The Impact of the Development of Electric Mobility on Consumption of Electric Energy in the Czech Republic

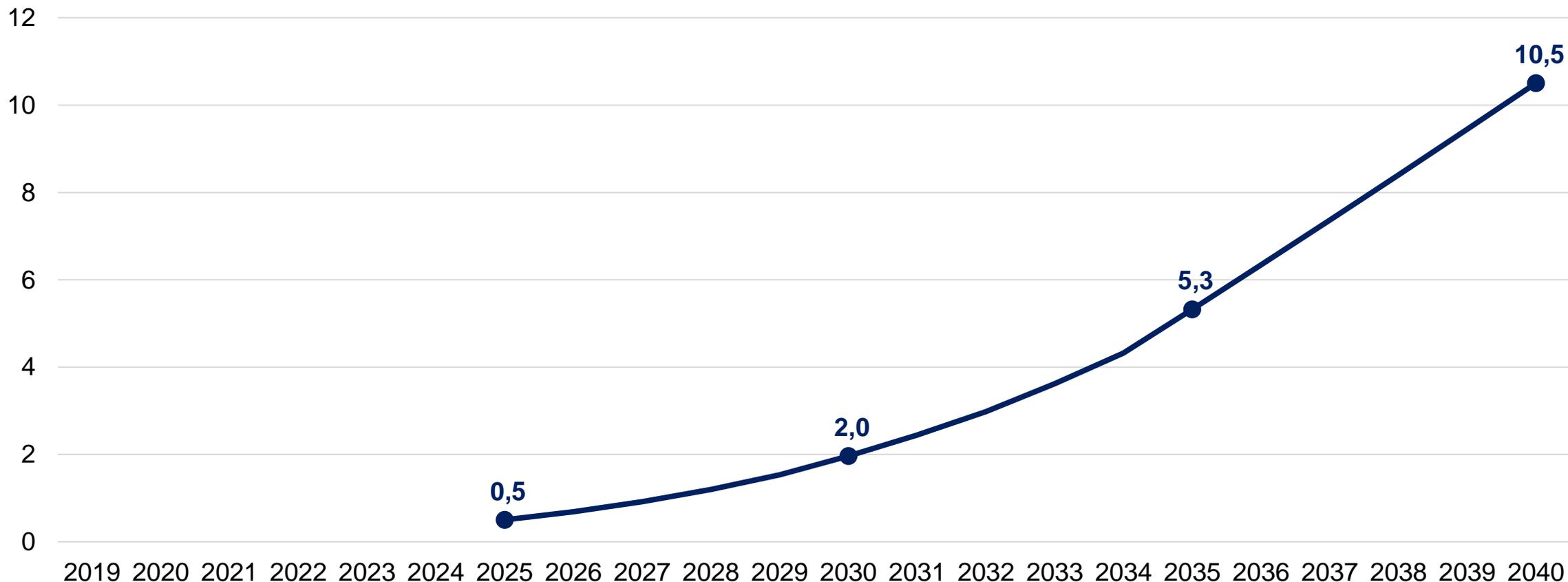
**Projection of the Number of New Passenger Electric Vehicles Registered and Their Total Number in Czechia to 2040 (If the Number of New Passenger Cars in the Czech Republic Increases by 1% per Year through 2040)**

Year	Number of newly registered electric vehicles in the Czech Republic	The share of newly registered electric vehicles in total new car sales in the Czech Republic	Number of electric vehicles in operation in the Czech Republic	The share of electric vehicles in the total fleet in the Czech Republic
2025	52 013	20 %	<b>143 696</b>	2.3 %
2030	122 998	45 %	<b>560 650</b>	8.4 %
2035	287 271	100 %	<b>1 521 449</b>	21.7 %
2040	301 925	100 %	<b>3 001 473</b>	40.7 %

Source: Own elaboration (2022). electric vehicle = battery electric vehicle (BEV) and plug-in hybrid (PHEV)

# The Impact of the Development of Electric Mobility on Consumption of Electric Energy in the Czech Republic

Total Electricity Consumption by Electric Cars in the Czech Republic in TWh



# The Impact of the Development of Electric Mobility on Consumption of Electric Energy in the Czech Republic

## Outlook for Total Electricity Consumption and Consumption by Electric Vehicles in the Czech Republic (TWh)

Year	Electricity Consumption (netto) - State Energy Policy (2015)	Electricity Consumption (netto) - Assessment of generation adequacy of the Czech Republic's electricity system (ČEPS. 2019)	Total electricity consumption by electric vehicles	The share of electromobility in the total electricity consumption in the Czech Republic (SEK scenario)	The share of electromobility in the total electricity consumption in the Czech Republic (CEPS scenario)
2030	70	75	2.0	3%	3%
2035	72	77	5.3	7%	7%
2040	74	78	10.5	14%	13%

***In theory, if all the passenger cars in operation in the Czech Republic were transformed into purely electric vehicles (BEV) today, they would consume a total of 21 TWh of electricity, which is 33% of total annual electricity consumption in the Czech Republic.***

# CONTACTS

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**Radek Novák, Tomáš Kozelský**

Economic and Strategic Research

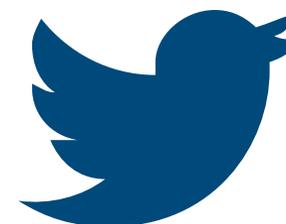
Česká spořitelna. a.s.

Budějovická 1518/13b

Praha 4. 140 00

tel.: +420 956 718 015

e-mail: [RadekNovak@csas.cz](mailto:RadekNovak@csas.cz), [TKozelsky@csas.cz](mailto:TKozelsky@csas.cz)



@Research\_sporka

**Thank you for your attention!**