

MARKET MONITOR

EUROPEAN PASSENGER CAR AND LIGHT COMMERCIAL VEHICLE REGISTRATIONS: JANUARY-DECEMBER 2022



New car registrations picked up pace in the fourth quarter of 2022, rounding out the year at just over 2,530,000. While many manufacturers still recorded decreased sales compared to 2021, the overall 5% drop for 2022 was less than after the third quarter, when a 10% drop was recorded. The Tesla-Honda pool remained an outlier, closing out the year with a 26% increase in new registrations compared to 2021, while registrations for Stellantis (-15%) and Volvo (-8%) were significantly lower than last year. The average share of battery electric vehicles (BEVs) jumped from 13% in the third quarter to 18% in the fourth quarter of 2022. The share of plug-in hybrid vehicles (PHEVs) increased to 12%, up from 9% in the third quarter. Overall, 13% of new cars registered in 2022 were BEVs, up three percentage points from 2021. The largest advances compared to 2021 were made by Volvo (+18 percentage points), with a 29% BEV share in 2022, and BMW (+6 percentage points), reaching a 15% BEV share. The Mazda-Subaru-Toyota pool continues to have the lowest share of BEVs, at only 1% of total registrations, down from 2% in 2021. All manufacturers were able to reach their specific CO₂ targets for 2022, with average over-compliance of around 12 g/km. The Mazda-Subaru-Toyota pool was the only manufacturing group that could still use super-credits but does not need them for compliance.

Table 1. New passenger car registrations, by manufacturer pool.

	New car registrations			
	Q4/2022	vs. Q4/2021	2022	vs. 2021
VW-SAIC	662,802	35%	2,423,161	-3%
Stellantis	438,758	-6%	1,835,993	-15%
Renault-Nissan-Mitsubishi	323,519	0%	1,193,120	-6%
Mazda-Subaru-Toyota	214,346	28%	799,150	3%
BMW	177,986	16%	638,158	-5%
Mercedes-Benz	162,586	15%	568,507	2%
Kia	105,948	5%	430,875	6%
Ford	105,563	17%	414,116	-4%
Hyundai	102,962	-9%	426,591	-2%
Volvo	80,152	27%	228,549	-8%
Tesla-Honda	77,361	56%	209,948	26%
Other	81,775	21%	281,086	-5%
ALL	2,533,758	14%	9,449,254	-5%

Table 2. Share of plug-in hybrid and battery electric passenger cars, by manufacturer pool.

	Share of plug-in hybrid and battery electric cars					
	Q4/2022		2022		2021	
	BEV	PHEV	BEV	PHEV	BEV	PHEV
Tesla-Honda	89%	0%	82%	0%	78%	0%
Volvo	43%	32%	29%	33%	11%	38%
Hyundai	20%	9%	16%	8%	14%	6%
VW-SAIC	20%	9%	13%	7%	11%	9%
BMW	19%	20%	15%	19%	9%	19%
Mercedes-Benz	18%	25%	14%	22%	12%	24%
AVERAGE	18%	12%	13%	10%	10%	9%
Renault-Nissan-Mitsubishi	16%	4%	13%	4%	11%	4%
Stellantis	14%	10%	11%	8%	7%	5%
Kia	12%	16%	13%	14%	12%	12%
Other	11%	19%	6%	16%	2%	8%
Ford	6%	19%	5%	12%	5%	10%
Mazda-Subaru-Toyota	2%	6%	1%	4%	2%	3%

Table 3. New passenger car fleet average CO₂ emission level, by manufacturer pool.

	Target gap	New car fleet average CO ₂ (in g/km)						
		Q4/2022	2022	Compliance credits		Status 2022	Target 2022	Target gap
		WLTP	WLTP	eco-innovations	super-credits	WLTP	WLTP	WLTP
Tesla-Honda	-83%	13	22	0.2	0	22	129	-107
Volvo	-46%	49	73	0.3	0	73	133	-60
BMW	-16%	98	106	1.4	0	105	126	-21
Kia	-10%	97	100	0.5	0	99	110	-11
Mercedes-Benz	-10%	101	113	0.7	0	112	124	-12
Stellantis	-10%	101	108	1.5	0	106	118	-12
AVERAGE	-10%	98	108	1.1	0.1	107	119	-12
Hyundai	-8%	95	102	0.5	0	101	110	-9
Ford	-5%	107	118	1.7	0	116	123	-7
Mazda-Subaru-Toyota	-5%	110	114	0.5	1.7	112	119	-7
Renault-Nissan-Mitsubishi	-3%	102	107	1.2	0	106	110	-4
VW-SAIC	-3%	107	118	1.2	0	117	120	-3

Notes: all CO₂ values are estimates, see methodology section.

Registration shares of BEVs and PHEVs in 2022 were the highest in Norway (88%). Iceland (58%), Sweden (56%), Finland (38%), Denmark (38%), the Netherlands (35%), Germany (31%), Belgium (26%) and Luxembourg (24%) also had BEV and PHEV registration shares above the European average of 23%.

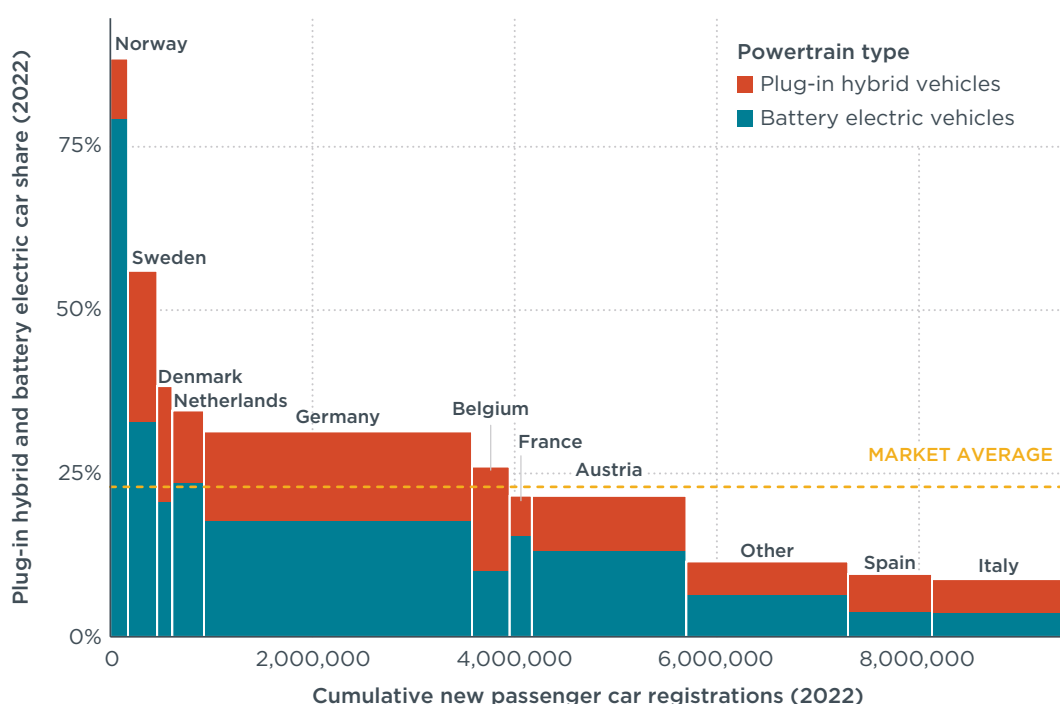


Figure 1. Share of plug-in hybrid and battery electric vehicles, by country, including information on market size (cumulative car registrations) in 2022..

Table 4. New passenger car registrations, by country.

New car registrations				
	Q4/2022	vs. Q4/2021	2022	vs. 2021
Germany	783,472	30%	2,651,357	1%
France	416,968	5%	1,529,035	-8%
Italy	342,030	17%	1,322,099	-10%
Spain	216,646	1%	828,770	-6%
Poland	103,368	4%	420,241	-6%
Netherlands	87,443	0%	312,137	-3%
Belgium	85,705	22%	372,469	-5%
Sweden	83,529	21%	289,339	-5%
Austria	52,400	3%	219,831	-10%
Czechia	48,244	7%	192,088	-7%
Other	313,953	8%	1,311,888	-4%
ALL	2,533,758	14%	9,449,254	-5%

Table 5. Share of plug-in hybrid and battery electric passenger cars, by country (EU only).

Share of plug-in hybrid and battery electric cars						
	Q4/2022		2022		2021	
	BEV	PHEV	BEV	PHEV	BEV	PHEV
Sweden	44%	23%	33%	23%	19%	26%
Netherlands	31%	9%	23%	11%	20%	10%
Other	29%	9%	20%	8%	15%	11%
Germany	25%	19%	18%	14%	14%	12%
Austria	19%	7%	16%	6%	14%	6%
AVERAGE	18%	12%	13%	10%	10%	9%
France	15%	9%	13%	8%	10%	8%
Belgium	14%	19%	10%	16%	6%	12%
Spain	5%	6%	4%	6%	3%	5%
Italy	4%	5%	4%	5%	5%	5%
Poland	3%	3%	3%	2%	2%	2%
Czechia	2%	2%	2%	2%	1%	2%

All manufacturers in the EU saw a decrease in new registrations of light commercial vehicles (vans) in 2022, with an average drop of 18% compared to 2021. The average share of battery electric vans increased from 6% in the third quarter to 8% in the fourth quarter, with only the Stellantis group (10%) posting a higher share of battery electric vans than the market average. Overall, average shares of battery electric vans increased two percentage points in 2022 (5%) compared to 2021. Germany was the country with the highest battery electric van share (8%) in 2022. With the exception of the Renault-Nissan-Mitsubishi group, all manufacturers achieved their 2022 CO₂ targets, with Stellantis leading in overcompliance, surpassing its 2022 CO₂ targets by 25 g/km.

Table 6. New van registrations, by manufacturer pool.

New vans registrations				
	Q4/2022	vs. Q4/2021	2022	vs. 2021
Stellantis	94,439	-24%	403,284	-25%
Volkswagen-Ford-SAIC	83,013	7%	315,305	-14%
Renault-Nissan-Mitsubishi	66,784	-13%	242,231	-26%
Mercedes-Benz	42,596	7%	143,635	-6%
Other	44,303	0%	171,370	-2%
ALL	331,135	-9%	1,275,825	-18%

Table 7. Share of plug-in hybrid and battery electric vans, by manufacturer pool.

Share of plug-in hybrid and battery electric vans						
	Q4/2022		2022		2021	
	BEV	PHEV	BEV	PHEV	BEV	PHEV
Other	12%	0%	7%	0%	4%	0%
Stellantis	10%	0%	7%	0%	2%	0%
AVERAGE	8%	0%	5%	0%	3%	0%
Renault-Nissan-Mitsubishi	8%	0%	5%	0%	5%	0%
Mercedes-Benz	6%	0%	5%	0%	4%	0%
Volkswagen-Ford-SAIC	6%	0%	3%	0%	2%	0%

Table 8. New vans fleet average CO₂ emission level, by manufacturer pool.

	Target gap	New vans fleet average CO ₂ (in g/km)					
		Q3/2022	2022	Credits	Status 2022	Target 2022	Target gap
		WLTP	WLTP	eco-innovations	WLTP	WLTP	WLTP
Stellantis	-13%	157	162	0	162	187	-25
AVERAGE	-5%	178	184	0	184	194	-10
Mercedes-Benz	-3%	210	214	0	214	221	-7
Volkswagen-Ford-SAIC	-3%	187	192	0	192	198	-6
Renault-Nissan-Mitsubishi	5%	181	193	0	193	185	8

Table 9. New van registrations, by country (EU only).

	New vans registrations			
	Q4/2022	vs. Q4/2021	2022	2021
France	89,669	-11%	346,091	-20%
Germany	66,707	5%	228,883	-13%
Italy	38,295	-14%	151,338	-13%
Spain	29,510	5%	105,326	-19%
Other	106,954	-15%	444,187	-20%
ALL	331,135	-9%	1,275,825	-18%

Table 10. Share of plug-in hybrid and battery electric vans by country.

	Share of plug-in hybrid and battery electric vans					
	Q4/2022		2022		2021	
	BEV	PHEV	BEV	PHEV	BEV	PHEV
Germany	12%	0%	8%	0%	5%	0%
Other	9%	0%	6%	0%	3%	0%
AVERAGE	8%	0%	5%	0%	3%	0%
France	8%	0%	5%	0%	3%	0%
Italy	4%	0%	3%	0%	2%	0%
Spain	4%	0%	3%	0%	2%	0%

By the end of 2022, there were around 516,000 publicly accessible electric vehicle charging points in Europe. This represents a 47% increase over the end of 2021. Europe-wide there were, on average, about 3.2 22 kW-equivalent publicly accessible charging points installed per thousand passenger cars on the road at the end of 2022, up from 1.9 at the end of 2021. This represents a 68% increase since last year. Norway (19.2) and the Netherlands (11.6) continue to lead, while more than half of the countries fell below the European average, including all Central and Eastern European countries. Poland (0.4), Cyprus (0.3), and Greece (0.3) still offer the fewest number of charging points per thousand passenger cars.

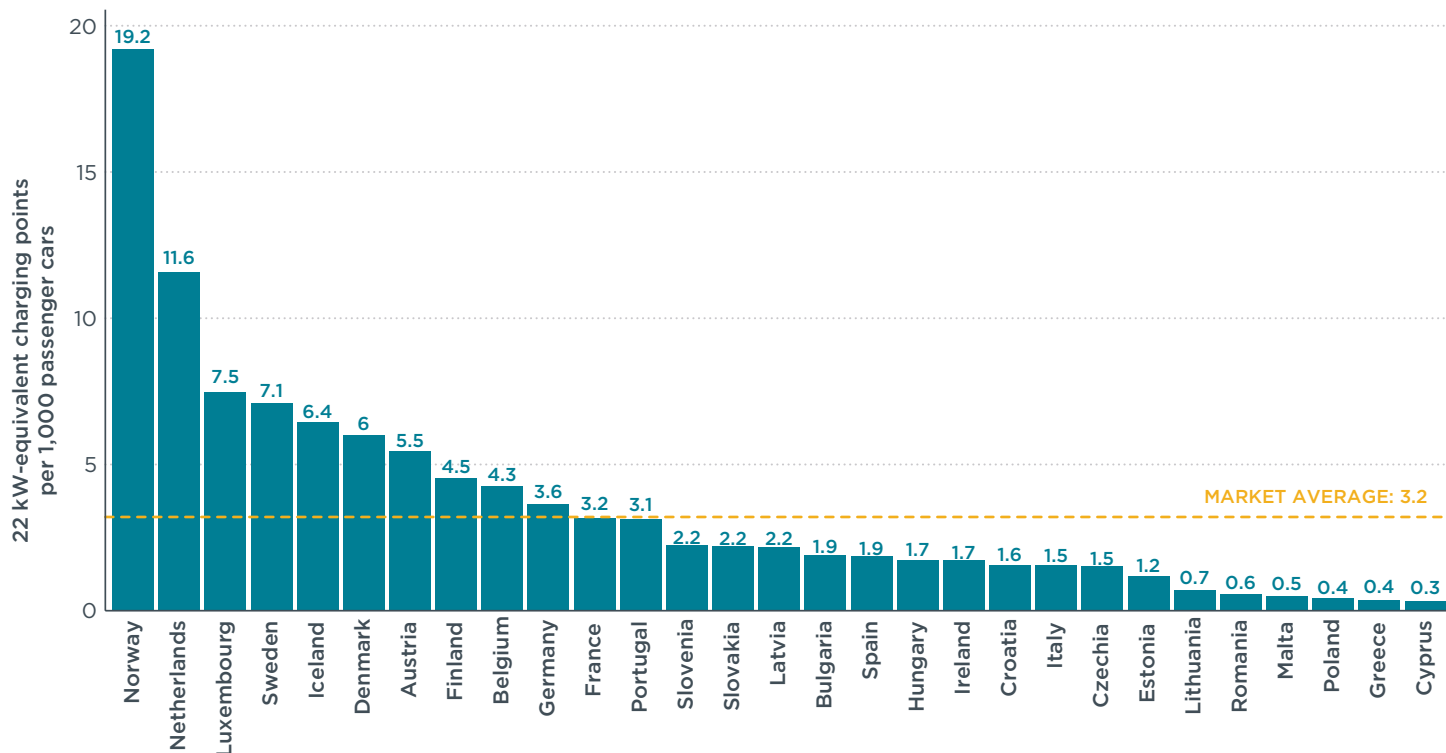


Figure 2. 22 kW-equivalent publicly accessible charging points installed per thousand passenger cars on the road in every EU and EFTA country by the end of the fourth quarter of 2022. 22 kW-equivalent is used to take into account different power outputs while allowing for comparison among countries. E.g., two 11kW alternating current (AC) chargers would be shown here as one 22 kW-equivalent charger, while one 50 kW direct current (DC) charger would equate to 2.3 22 kW-equivalent chargers.

To aid in its efforts to achieve carbon neutrality by 2045, Sweden introduced a bonus-malus system for new passenger cars, light trucks, and light buses in 2018. This system includes subsidies for newly purchased electric vehicles (discontinued in November 2022), while imposing additional taxes on non-electric vehicles in the first three years of ownership. The country saw a substantial uptick in new battery electric and plug-in hybrid vehicle shares towards the end of 2022, reaching an all-time high of 75% of new registrations in December. This represents a 23% increase over December of 2021. Although shares have steadily increased in Sweden in recent years, this recent peak can likely be attributed to the phase-out of subsidies for electric vehicles, both battery electric and plug-in hybrid, in November 2022. Given that the deadline applied to new car orders rather than new registrations, this trend will likely continue into 2023. Tax rebates for electric company cars and incentives for both businesses and private persons to invest in charging infrastructure have also played a role in increasing electric vehicle shares in Sweden.

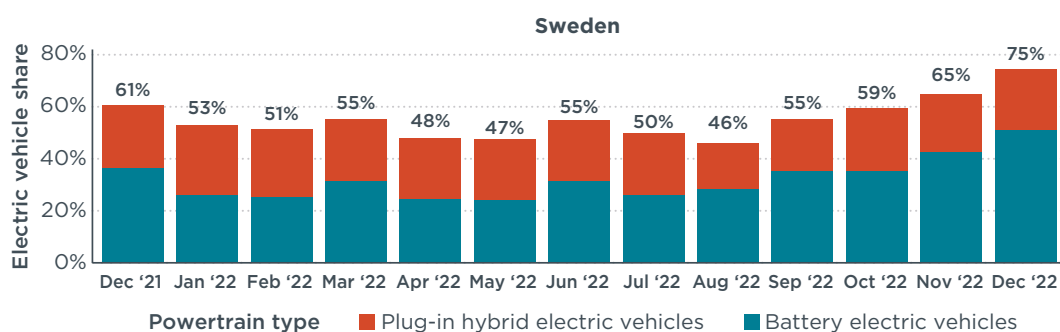


Figure 3. Share of new battery electric and plug-in hybrid passenger cars in Sweden (spotlight of the month).

Sweden's charging infrastructure development continues to support its rapid transition to electric vehicles. At the end of 2022, Sweden had 7.1 22 kW-equivalent publicly accessible charging points installed per thousand passenger cars on the road, landing well above the European average of 3.2. This is a 65% increase over the 4.3 charging points on record at the end of 2021. Of these publicly accessible charging stations, 88% offered alternating current (AC) charging, most of which are 22 kW chargers.

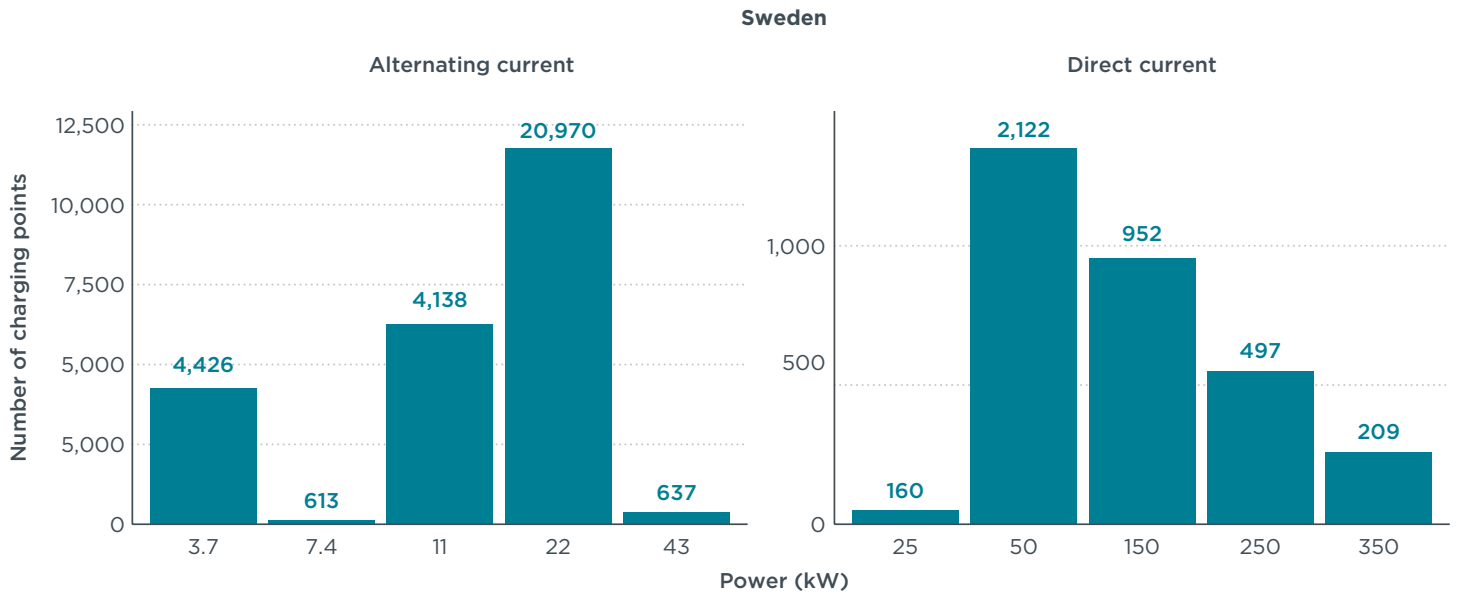


Figure 4. Number of publicly accessible alternating current normal (left) and direct current fast (right) charging points in Sweden by the end of 2022. Chargers are bundled by power bins, e.g., all DC chargers with a reported rated power output between 200 kW and 300 kW are considered as 250 kW.

DEFINITIONS, DATA SOURCES, METHODOLOGY, AND ASSUMPTIONS

Manufacturer pools: Automakers are allowed to form pools to jointly comply with CO₂ targets. For this factsheet, the definition of pools according to the European Commission, “M1 pooling list”, version of 14 July 2022 applies (main brands listed here): BMW Group (BMW, Mini), Ford (Ford), Hyundai (Hyundai), Kia (Kia), Mazda-Subaru-Toyota (Lexus, Mazda, Subaru, Toyota), Mercedes-Benz (Mercedes-Benz, Smart), Renault-Nissan-Mitsubishi (Dacia, Mitsubishi, Nissan, Renault), Stellantis (Alfa Romeo, Citroën, Fiat, Jeep, Lancia, Opel, Peugeot), Tesla-Honda (Honda, Tesla), Volvo (Volvo) and VW-SAIC (Audi, Cupra, Porsche, SEAT, Škoda, VW). For light commercial vehicles, the “N1 pooling list”, version 20 December 2021, applies: Mercedes-Benz (Mercedes-Benz, Mitsubishi Fuso), Renault-Nissan-Mitsubishi (Mitsubishi, Nissan, Renault), Stellantis (Citroën, Fiat, Opel, Peugeot), Volkswagen-Ford-SAIC (Ford, MAN, Volkswagen).

Abbreviations: CO₂ = carbon dioxide emissions; g/km = grams per kilometer; YTD = year to date.

Technical scope: This factsheet focuses on new **passenger car** and **light commercial vehicle** registrations. **Electric vehicles** here include battery electric (BEV), plug-in hybrid electric (PHEV), and fuel cell vehicles.

Geographic scope: The European CO₂ regulation for vehicle manufacturers applies to all countries of the European Economic Area (EEA). This includes the 27 Member States of the European Union, plus Iceland, Liechtenstein, and Norway. Data for new car registrations and shares of electric vehicles in this factsheet cover all of these countries, with the exception of Bulgaria, Liechtenstein, and Malta. Data for CO₂ emission levels additionally omit Hungary, Lithuania, Poland (until April 2020), Portugal, and Romania (together less than 10% of the total market). Charging infrastructure data are presented for the 27 EU members plus the 4 EFTA countries (Iceland, Liechtenstein, Norway, Switzerland).

Data sources: AAA DATA (France), Dataforce (all other markets), Eco-Movement (charging points).

Results may change over time: Registrations and/or CO₂ data may be retrospectively updated by some of the national type approval authorities. Historical values are regularly updated to reflect all latest data available.

Test procedures: CO₂ values are provided according to the Worldwide harmonized Light vehicles Test Procedure (WLTP).

Flexible compliance mechanisms: To facilitate meeting their CO₂ targets, manufacturers can make use of a number of compliance mechanisms: (1) Manufacturers can reduce their CO₂ level by up to 7 g/km by deploying **eco-innovation** technologies. To incentivize eco-innovations, CO₂ savings from eco-innovations per passenger car and light commercial vehicle are amplified by multipliers in the years 2021, 2022 and 2023. For 2022, the multiplier is set to 1.7. As a conservative estimate, we apply the 2021 (cars) / 2020 (vans) level of eco-innovation CO₂ emission reductions per manufacturer¹, (2) New passenger cars with less than 50 g/km CO₂/km (NEDC) are counted 1.33 times in 2022 (**super-credit**). The impact of super-credits for complying with the CO₂ targets is capped at 7.5 g/km per manufacturer for the years 2020-2022 together.

Mass-based targets: For each manufacturer pool, a specific **2022 CO₂ target value** applies, depending on the average mass of the new cars registered. For this factsheet, we assume the average mass per manufacturer pool to remain constant with respect to the market situation in 2021 (cars) / 2020 (vans).²

Charging point: As defined in the Alternative Fuel Infrastructure regulation proposal, a charging point “means a fixed or mobile interface that allows for the transfer of electricity to an electric vehicle, which, whilst it may have one or several connectors to accommodate different connector types, is capable of recharging only one electric vehicle at a time, and excludes devices with a power output less than or equal to 3.7 kW the primary purpose of which is not recharging electric vehicles.”

- 1 Applying the methodology outlined in: Uwe Tietge, Peter Mock, and Jan Dornoff, *Overview and evaluation of eco-innovations in European passenger car CO₂ standards*, (ICCT: Washington, DC, 2018), <https://theicct.org/publications/eco-innovations-european-passenger-car-co2-standards>.
- 2 Uwe Tietge, Jan Dornoff, Peter Mock, and Sonsoles Díaz, *CO₂ emissions from new passenger cars in Europe: Car manufacturers' performance in 2021*, (ICCT: Washington, DC, 2022), <https://theicct.org/publication/co2-new-passenger-cars-europe-aug22/>

Contact: Peter Mock, +49 30 233 268 410, peter@theicct.org

2023 © INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

BEIJING | BERLIN | SAN FRANCISCO | SÃO PAULO | WASHINGTON

www.theicct.org

communications@theicct.org

[twitter @theicct](https://twitter.com/theicct)


THE INTERNATIONAL COUNCIL
ON CLEAN TRANSPORTATION