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Monitoring CO_2 emissions from new passenger cars and vans in 2014

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Caveat

Since finalisation of the EEA report and underpinning datasets, Volkswagen Group has publicly confirmed that the CO_2 emission values it has published for some models are incorrectly stated. The company is presently reviewing which models are specifically affected. This report documents the latest official data submitted by Member States and vehicle manufacturers. However it is not possible to assess the extent to which incorrect data from vehicle manufacturers may alter the analysis and conclusions.

Executive summary

The European Environment Agency (EEA) supports the European Commission (EC) and European Union (EU) Member States in the monitoring of the carbon dioxide (CO_2) performance of passenger cars, in accordance with Regulation (EC) No 443/2009, and of light commercial vehicles, in accordance with Regulation (EC) No 510/2011. The regulation for passenger cars sets a CO_2 emission ([1]) target of 130 g CO_2/km to be met by 2015, while the regulation for light commercial vehicles sets a CO_2 'emission' target of 175 g CO_2/km to be met by 2017. A binding annual 'specific emissions target' is calculated for each manufacturer based on the average mass of its fleet both for passenger cars and vans ([2]). The 2015 (cars) target is being phased in gradually from 2012, while the 2017 (vans) target was phased in gradually from 2014. The reported CO_2 emissions data presented in this report are based on measurements performed in the laboratory using a standard European vehicle test cycle. Such measurements may not reflect real-world driving performance.

In the medium term, targets of 95 g CO_2/km, to apply to the entire fleet from 2021, and of 147 g CO_2/km, applicable from 2020, have been set for passenger cars and for light commercial vehicles, respectively. The modalities for compliance with these targets were agreed by the European Parliament and the Council in 2014, with Regulation (EU) No 333/2014 amending Regulation (EC) No 443/2009 (EU, 2009) and Regulation (EU) No 253/2014 amending Regulation (EU) No 510/2011 (EU, 2011).

In order to evaluate the progress that manufacturers are making towards their targets, the EEA has collected and quality checked data on CO_2 emissions from passenger cars and vans registered in all EU Member States ([3]) since 2010. Using Member State data, as verified by manufacturers ([4]), this report provides an overview of the performance of car and van manufacturers in meeting their 2014 CO_2 emission targets.

The monitoring of vans is more complex than of passenger cars, owing to the relatively high number of multi-stage vehicles ([5]), in which different parts are built by different manufacturers. To address this issue, in 2015, a new monitoring system was put in place that allows each new light commercial vehicle registered in Europe to be identified through a unique vehicle identification number.

The main findings are:

- In 2014, the new car fleet emitted, on average, 123.4 g CO_2/km, significantly below the 2015 target of 130 g CO_2/km and a reduction of 2.6% compared with 2013.
- The average emission of new light commercial vehicles in 2014 was 169.1 g CO_2/km, which is below the 2017 target of 175 g CO_2km and a reduction of 2.4% compared with 2013.
- The difference between preliminary average emissions (the emissions data reported earlier in 2015 by each of the Member States) and final average emissions data (the emissions data after any corrections made by the manufacturers) was insignificant (< 0.1 g CO_2/km).

([1]) In this context, 'emissions' means 'emissions per vehicle kilometre'.
([2]) For the purposes of calculating this average, manufacturers are permitted to form pools with other manufacturers. If a pool is formed, the average value is calculated based on all the cars sold in a given year by the manufacturers in that pool.
([3]) The geographical scope of the data changes over time. See Annex 1 for details.
([4]) Data on average specific emissions are provided to the EEA and the European Commission by EU Member States. These preliminary data are then submitted to manufacturers, which have three months to notify the Commission if they notice errors with the data. The Commission then considers any notifications from the manufacturer and either confirms or amends the preliminary data. These amended/confirmed data are referred to as final average specific emissions.
([5]) Multi-stage vehicles are vehicles built in two or more stages. An incomplete vehicle, such as a chassis-cab or a cut-away chassis, built by one manufacturer, is completed by another manufacturer, which adds work-performing or cargo-carrying components to the vehicle (e.g. box truck, camper vans, dump truck).

- More diesel vehicles continue to be sold than petrol ones in the EU. In 2014, diesel cars represented 53% of new vehicles.
- In 2014, an average diesel car emitted 123.2 g CO_2/km, just 2.5 g CO_2/km less than a petrol car, whereas in 2000 the emissions difference between diesel and petrol vehicles was much larger (17.1 g CO_2/km).
- More efficient models were bought in the pre-2004 EU Member States than in the newer EU Member States. On average, the most efficient cars were bought in the Netherlands (107 g CO_2/km), Greece (108 g CO_2/km) and Portugal (109 g CO_2/km). For vans, average emission levels were lowest among new vans sold in Portugal (145 g CO_2/km) and Malta (146 g CO_2/km).
- The average vehicle mass of the passenger car fleet decreased to the level observed in 2010 (1 375 kg). The average mass of the light commercial vehicle fleet is similar to that observed in 2013 (1 764 kg).
- Almost all car and light commercial vehicle manufacturers achieved their CO_2 emission targets set for 2014.

In addition to manufacturers' pivotal role in achieving their specific emissions targets, Member States can influence the uptake of efficient vehicles, including through taxation (registrations tax, circulation tax and fuel tax). In the last section of the report, a summary of the taxation systems in place in Europe is presented.

1 Introduction

To reduce carbon dioxide (CO_2) emissions in the road transport sector, the European Parliament and the Council has adopted two important regulations: Regulation (EC) No 443/2009, which introduced mandatory CO_2 emission performance standards for new passenger cars, and Regulation (EU) No 510/2011, which introduced mandatory CO_2 emission performance standards for new vans.

For passenger cars, the regulation sets a CO_2 emission target of 130 g CO_2/km by 2015, defined as the average value for the fleet of newly registered passenger cars in the European Union (EU). A medium-term target of 95 g CO_2/km has been set for 2021 (to be phased in from 2020).

For vans, Regulation (EU) No 510/2011 sets a CO_2 emission target of 175 g CO_2/km by 2017, defined as the average value for the fleet of newly registered vans in the EU. A medium-term target of 147 g CO_2/km has been set for 2020.

The modalities of compliance by manufacturers with the respective targets for passenger cars and vans have been established, and these are presented in the following chapter.

The progress of manufacturers in meeting their specific targets is evaluated on an annual basis by calculating the following three parameters:

- CO_2 average specific emissions;
- the specific CO_2 emission target for that year;
- the difference between the average specific emissions and the specific emissions target.

Country groupings

Throughout this report, the following abbreviations are used to refer to specific country groupings:

- **EU-13:** Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia;
- **EU-15:** Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom;
- **EU-27:** EU-28 excluding Croatia;
- **EU-28:** EU-15 and EU-13;
- **EEA-33:** European Environment Agency (EEA) member countries (EU-28 and Iceland, Liechtenstein, Norway, Switzerland, Turkey).

2 Methods

Since 2010, the European Environment Agency (EEA) has collected data from passenger cars registered in all EU Member States and data form vans since 2013. The two regulations have the same time schedule for the monitoring and reporting of CO_2 emissions:

- Member States record information for each new passenger car and van registered in its territory and transmit this information to the European Commission by 28 February of each year. Data are submitted to the Central Data Repository (CDR ([6])) managed by the EEA.
- For vans only, manufacturers transmit information for each vehicle sold in the EU-28 to the European Commission by 28 February of each year. These confidential data are submitted to the Business Data Repository (BDR ([7])) managed by the EEA.
- The EEA performs various quality checks in order to evaluate the accuracy and the quality of the data sets. On the basis of the checks and the feedback from Member States, the EEA finalises and publishes a preliminary database in spring of each year. At the same time, notification letters are sent to manufacturers informing them of their provisional CO_2 performance.
- Manufacturers can, within three months of being notified of the provisional calculation, notify the Commission of any errors in the data. In order to facilitate error notification for vans, those manufacturers that submitted vehicle identification numbers (VINs) are informed about those VINs matching with Member State data.
- The EEA and the European Commission subsequently assess the manufacturers' corrections and, where justified, take them into account for the calculation of the manufacturer final average specific CO_2 emissions and specific emissions targets. The final data and targets need to be published by 31 October each year.

The following sections describe the data compilation process in further detail.

2.1 Provisional data

The EEA performs various quality checks in order to evaluate the accuracy and the quality of the Member States' data. These checks address various issues:

- Completeness, comprising two main components. The first component concerns numerical data such as vehicle mass and emissions rates for each vehicle. The second component checks the extent to which more granular data — such as model type — are available for each registered vehicle.
- Data plausibility and outliers ([8]).
- Assignment of a specific manufacturer using a harmonised denomination. Identical vehicles are often sold under different brand or model names in different countries. For the purposes of this report, one naming system is used to ensure correct manufacturer attribution.
- Data variability (for the same vehicle, an estimate of the variability of the mass, emissions and engine capacity are checked).
- Fuel type classification.
- Handling of unknown, individual vehicle approvals (IVAs) and national small series (NSS) vehicles ([9]).

([6]) CDR is an online data repository within which countries upload to the EEA data reports on the environment as required by European legislation or under international agreements (http://cdr.eionet.europa.eu).
([7]) BDR is an online reporting system managed by the EEA specifically for the handling of confidential company-based information (http://bdr.eionet.europa.eu).
([8]) An outlier observation is one that is well outside the expected range of values in a study or experiment and can be discarded from the data set.
([9]) IVAs are applicable to vehicles imported from third countries or to own-build vehicles that have to be individually approved. NSS vehicles are vehicles that are approved nationally in very small numbers, typically because they are made by smaller manufacturers.

- For vans, a comparison of the VINs ([10]) provided by Member States and by manufacturers is performed. Whenever VINs are matching but data is missing in a Member State's submission, manufacturer data is used to complete the data set.

On the basis of these checks, national competent authorities are asked for further clarification and/or corrections of their data sets. Once the quality checks have been completed, the provisional database is published and the manufacturers are notified of the provisional data.

2.2 Calculation of manufacturers' performances

Average specific emissions of CO_2 are calculated as a weighted average of the manufacturer's fleet registered in a particular year. The average specific emissions for each manufacturer are subsequently adjusted to take into account the following modalities (Tables 2.1 and 2.2):

- phase-in;
- super-credits;
- E85 extra credits;
- eco-innovations.

2.2.1 Phase-in

A phasing in schedule is applied when calculating average specific emissions for both cars and vans:

- For passenger cars, during the period 2012–2014, only a certain percentage (65% in 2012, 75% in 2013 and 80% in 2014) of the best-performing registered cars were taken into account in determining the performance of manufacturers. For the period 2015–2019, 100% of the new cars of each manufacturer will be taken into account. The 2021 specific emissions will be phased in from 2020, taking into account 95% of the best-performing cars in that year. From 2021, 100% of the new cars of each manufacturer will be taken into account.

- For vans, during the period 2014–2016, only a certain percentage (70% in 2014, 75% in 2015 and 80% in 2016) of the best-performing registered vans are taken into account in determining the performance of manufacturers. From 2017 onwards, 100% of the new vans of each manufacturer will be taken into account.

2.2.2 Super-credits

The two regulations apply the concept of super-credits for new passenger cars and new vans with CO_2 emissions lower than 50 g CO_2/km. These vehicles are given a greater weight in calculating the average specific emissions, as they are considered equivalent to:

- 3.5 cars in 2012 and 2013, 2.5 cars in 2014, 1.5 cars in 2015 and 1 car in 2016 (for the 95 g CO_2/km target, the weight factor will become 2 cars in 2020, 1.67 cars in 2021, 1.33 cars in 2022 and 1 car in 2023 and subsequent years);

- 3.5 vans in 2014 and 2015, 2.5 vans in 2016, 1.5 vans in 2017 and 1 van in 2018 and subsequent years.

2.2.3 E85 extra credits

Additional reductions of average specific emissions are assigned to vehicles capable of running on a mixture of petrol with 85% ethanol ('E85'). Until 2015, the emissions of these vehicles were counted as being 5% lower than their actual emissions, in recognition of their ability to reduce emissions when running on biofuels. This reduction can be applied only when at least 30% of the filling stations in the Member State in which the vehicle is registered provide this type of alternative fuel. In 2014, this applied only to Sweden.

2.2.4 Eco-innovations

In order to support technical development, a manufacturer or supplier can apply to the Commission for the approval of innovative technologies that can make a verified contribution to CO_2 reduction that is not covered by the standard test cycle under the current type-approval test procedure. The approval conditions are set out in Commission Regulation (EU) No 725/2011. Certified CO_2 savings from eco-innovations are taken into account for the specific average emissions, but cannot reduce a manufacturer's specific emissions by more than 7 g CO_2/km. To date, 2015 was the third year that eco-innovations were submitted to the Commission and, so far, 12 eco-innovations (e.g. light-emitting diodes in certain lighting functions of a vehicle) ([11]) have been approved.

([10]) A VIN is a unique code, including a serial number, used by the automotive industry to identify individual motor vehicles, in accordance with ISO 833.

([11]) For more information on eco-innovations, see http://ec.europa.eu/clima/policies/transport/vehicles/cars/documentation_en.htm

2.3 Specific emissions targets

Each manufacturer has an individual annual target, calculated on the basis of the 'mass in running order' ([12]) of its newly registered cars/vans. The following formulae apply to passenger cars (1) and vans (2) until 2020:

(1) Specific emissions of $CO_2 = 130 + a \times (M - M_0)$

where:

M is the average mass of the manufacturer's fleet in kilograms (kg)

M_0 is the reference mass (1 372.0 kg)

a is 0.0457.

(2) Specific emissions of $CO_2 = 175 + a \times (M - M_0)$

where:

M is the average mass of the manufacturer's fleet in kilograms (kg)

M_0 is the reference mass (1 706.0 kg)

a is 0.093.

This means that, for example, if the average mass of a manufacturer's fleet in a given year is 1 472 kg, the target for that manufacturer is 134.57 g CO_2/km. Alternatively, if the average mass of the fleet is 1 272 kg, the target will be 125.43 g CO_2/km.

By 31 October 2014, and every three years thereafter, M_0 is amended to the average mass of new passenger cars in the previous three calendar years. The new M_0, agreed in 2014, will be used for the first time in 2016. As the average mass of the new fleet in the period 2011–2013 increased by almost 20 kg compared with the M_0 in formula (1), the limit values curve will shift and, as a consequence, the specific emissions target of a manufacturer that is responsible for a new fleet with an average mass of 1 392.35 kg will be 130 g CO_2/km, whereas the target for that manufacturer was 130.9 g CO_2/km in 2012.

The manufacturer complies with its specific emissions target if its average specific emissions (taking into account all the relevant adjustments) are lower than its target.

These formulae aim to ensure undistorted competition between manufacturers, while taking into account their differences.

Regulation (EU) No 333/2014 and Regulation (EU) No 253/2014 amended, respectively, Regulation (EC) No 443/2009 and Regulation (EU) No 510/2011 with a view to defining the modalities for reaching the 2020 target for new passenger cars and vans. The medium-term targets of 95 g CO_2/km for passenger cars and 147 g CO_2/km for vans, proposed in the previous regulations, were confirmed and the following formulae apply to passenger cars (3) and vans (4) from 2020:

(3) Specific emissions of $CO_2 = 95 + a \times (M - M_0)$

where:

M is the average mass of the manufacturer's fleet in kilograms (kg)

M_0 is the reference mass

a is 0.0333.

(4) Specific emissions of $CO_2 = 147 + a \times (M - M_0)$

where:

M is the average mass of the manufacturer's fleet in kilograms (kg)

M_0 is the reference mass

a is 0.096.

([12]) According to Regulation (EC) No 443/2009, 'mass in running order' means the mass of the car including bodywork, coolant, oils, fuel, spare wheel, tools and driver, as stated in the certificate of conformity and defined in Section 2.6 of Annex I to Directive 2007/46/EC.

2.3.1 Pools

Manufacturers may form a pool with other manufacturers in order to share a target. In such instances, the binding target will be the pool target (calculated on the basis of the whole fleet of the pool registered that year). There were 13 pools for passenger cars (Table 2.3) and 8 pools for vans (Table 2.4) declared with regard to the 2014 targets.

2.3.2 Small-volume derogations

Manufacturers selling fewer than 10 000 vehicles per year can apply for a derogation. In this case, a specific emissions target consistent with the manufacturer's economic and technological potential to reduce specific CO_2 emissions can be granted. In 2014, 5 manufacturers benefited from small-volume derogations for passenger cars (Table 2.5) and 5 manufacturers benefited from small-volume derogations for vans (Table 2.6)

2.3.3 Niche derogations

Niche derogations are foreseen for manufacturers responsible for between 10 000 and 300 000 new vehicle registrations. In this case, a special target is established, corresponding to a 25% reduction compared with the average specific emissions of that manufacturer in 2007 for the period 2012–2019, and a 45% reduction from the 2007 level as of 2020. In 2014, four niche derogations were granted for passenger cars (Table 2.7).

2.3.4 De minimis exemptions

A manufacturer that, together with all of its connected undertakings, is responsible for fewer than 1 000 new registered cars may be exempt from meeting a specific emission target pursuant to Regulation (EC) No 443/2009 and Regulation (EU) No 510/2011, as amended by Regulation (EU) No 333/2014 and Regulation (EU) No 253/2014. In 2014, in total there were 35 manufacturers responsible for a total of around 6 500 vehicles that benefited from this exemption (22 for passenger cars and 13 for vans).

Table 2.1 Summary of the parameters applying to the calculation of manufacturer performance from 2013 to 2019

		2013	2014	2015	2016	2017–19
Phase-in	Passenger cars	75%	80%	100%	100%	100%
	Vans	70%	70%	75%	80%	100%
Super-credit for vehicle emitting less than 50 g CO_2/km	Passenger cars	3.5	2.5	1.5	1	1
	Vans	3.5	3.5	3.5	2.5	1.5
Emission reduction for E85 vehicles (a)	Passenger cars/vans	5%	5%	5%	0%	0%

Note: (a) Applies only when at least 30 % of the filling stations in the Member State in which the vehicle is registered provide this type of alternative fuel.

Table 2.2 Summary of the parameters applying to the calculation of passenger cars manufacturer performance from 2020

	2020	2021	2022	2023
Phase-in	95%	100%	100%	100%
Super-credit for vehicle emitting less than 50 g CO_2/km	2	1.67	1.33	1

Table 2.3 Manufacturers' pools in 2014 — passenger cars

Pool	Manufacturer
BMW Group	Bayerische Motoren Werke AG
	BMW M GmbH
	Rolls-Royce Motor Cars Ltd
Daimler AG	Daimler AG
	Mercedes-AMG GmbH
Fiat Group Automobiles SPA	Chrysler Group LLC
	Fiat Group Automobiles SPA
	Maserati SPA
Ford-Werke GmbH	CNG-Technik GmbH
	Ford Motor Company
	Ford-Werke GmbH
General Motors	Adam Opel AG
	Chevrolet Italia SPA
	General Motors Company
	GM Korea Company
Honda Motor Europe Ltd	Honda Automobile China Co Ltd
	Honda Motor Co Ltd
	Honda of the UK Manufacturing Ltd
	Honda Turkiye AS
Hyundai	Hyundai Assan Otomotiv Sanayi VE
	Hyundai Motor Company
	Hyundai Motor India Ltd
	Hyundai Motor Manufacturing Czech SRO
Kia	Kia Motors Corporation
	Kia Motors Slovakia SRO
Mitsubishi Motors	Mitsubishi Motors Corporation MMC
	Mitsubishi Motors Europe BV MME
	Mitsubishi Motors Thailand Co Ltd MMTH
Pool Renault	Automobile Dacia SA
	Avtovaz JSC
	Oao Avtovaz
	Renault SAS
Suzuki	Magyar Suzuki Corporation Ltd
	Maruti Suzuki India Ltd
	Suzuki Motor Corporation
	Suzuki Motor Thailand Co Ltd
Tata Motors Ltd, Jaguar Cars Ltd , Land Rover	Jaguar Land Rover Limited
	Tata Motors Limited
VW Group PC	Audi AG
	Audi Hungaria Motor KFT
	Automobili Lamborghini SPA
	Bentley Motors Ltd
	Bugatti Automobiles SAS
	Dr Ing HCF Porsche AG
	Quattro GmbH
	Seat SA
	Skoda Auto AS
	Volkswagen AG

Table 2.4 Manufacturers' pools in 2014 — vans

Pool	Manufacturer
Daimler	Daimler AG
	Fuso
	Fuso Europe
	MFTBC
Fiat Group Automobiles SPA	Chrysler
	Fiat Group
Ford-Werke GmbH	CNG Technik
	Ford Motor Australia
	Ford Motor Company
	Ford Werke GmbH
General Motors	GM Korea
	Opel
Kia	Kia
	Kia Slovakia
Mitsubishi Motors	Mitsubishi Motors Corporation
	Mitsubishi Motors Europe
	Mitsubishi Motors Thailand
Pool Renault	Avtovaz
	Dacia
	Lada France
	Renault
Volkswagen Group LCV	Audi AG
	Porsche
	Quattro
	Seat
	Skoda
	Volkswagen

Table 2.5 Manufacturers with small volume derogations in 2014 (passenger cars)

Manufacturer	Specific emissions targets in (g CO_2/km)
Aston Martin Lagonda Ltd	313.00
Ferrari SPA	303.00
Mclaren Automotive Limited	280.00
MG Motor UK Limited	149.50
Ssangyong Motor Company	180.00

Table 2.6 Manufacturers with small volume derogations in 2014 (vans)

Manufacturer	Specific emissions targets in (g CO_2/km)
GONOW Auto Co Ltd	175.00
Jaguar Land Rover Limited	276.93
Mitsubishi	210.00
Piaggio & C SPA	155.00
Ssangyong Motor Company	210.00

Table 2.7 Niche derogations in 2014 (passenger cars)

Manufacturer/pool	Specific emissions targets in (g CO_2/km)
Fuji Heavy Industries Ltd	164.616
Mazda Motor Corporation	129.426
Suzuki Pool	123.114
Tata Motors Ltd, Jaguar Cars Land Rover	178.025

Box 2.1 Legislative driving cycles

CO_2 emission targets and vehicle monitoring data are based on the CO_2 emissions determined by the New European Driving Cycle (NEDC) as part of the type-approval process. Recently there has been a growing awareness that the NEDC type-approval driving cycle does not represent 'real-world' driving conditions very well, as it covers only a small portion of the vehicle engine operation in both load and speed (i.e. the driving cycle has an artificial driving speed pattern with low accelerations, constant speed cruises and many idling events).

Numerous studies have documented the often significant and increasing divergence between type-approval and real-world CO_2 emissions and fuel consumption. In order to address this situation, work is underway to implement the World Harmonised Light Vehicle Test Procedure (WLTP) in EU type-approval legislation. It is expected that the WLTP will better reflect real-world driving emissions.

3 Passenger cars

3.1 Number of new registrations

Since 2007, when 15.5 million vehicles were registered in the EU-28 ([13]) (see Table A1.1 in Annex 1), the number of new registrations has decreased each year. However, for the first time since 2007, new passenger car registrations increased in 2014 compared with the previous year, with around 700 000 (6%) more vehicles than in 2013 being sold in the EU-28, with a total of 12.5 million new passenger cars (Figure 3.1). A higher number of registrations were noted in 25 out of the 28 Member States. The greatest increases in new vehicle registrations were observed in Portugal (+ 35%), Ireland (+ 29%) and Croatia (+ 24%), whereas the largest decreases were seen in the Netherlands (– 8%) and Austria (– 5%). Despite the 6% increase in registrations observed in 2014, compared with 2007 the number of new vehicle registrations is still lower by 19%. This decrease is largest in southern Member States, where car registrations in 2014 had decreased by 76% in Greece, 46% in Italy, 44% in Spain and 30% in Portugal compared with 2007.

Germany is the largest vehicle market in Europe, having a 24% share in 2014, followed by the United Kingdom (20%) and France (15%). Together, these Member States represent almost 60% of total EU sales. Over the past decade, the percentage share of new EU car sales in Italy and Spain has dropped from 15 and 11%, respectively, in 2005 to 11 and 7% in 2014.

3.2 Average CO_2 emissions from new passenger cars

The final data presented in this report confirm the preliminary data published earlier in 2014, i.e. the average CO_2 emissions from the new passenger car fleet in the EU in 2014 were 123.4 g CO_2/km (Figure 3.2). The average emissions of CO_2 in 2014 had decreased

Figure 3.1 Number of passenger cars registered in the EU-28 between 2005 and 2014

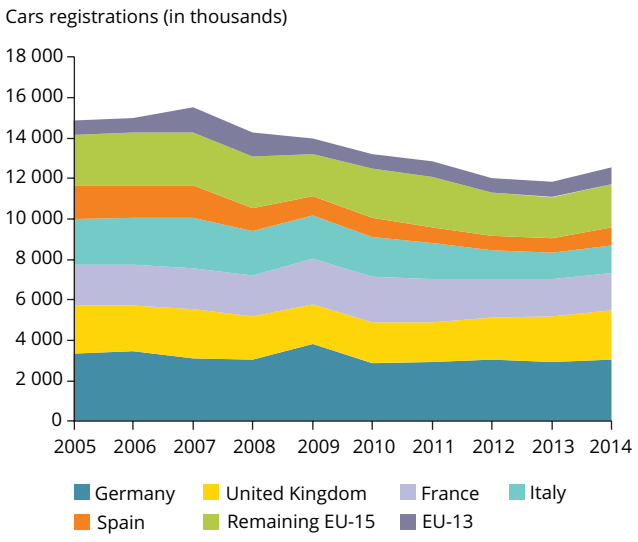
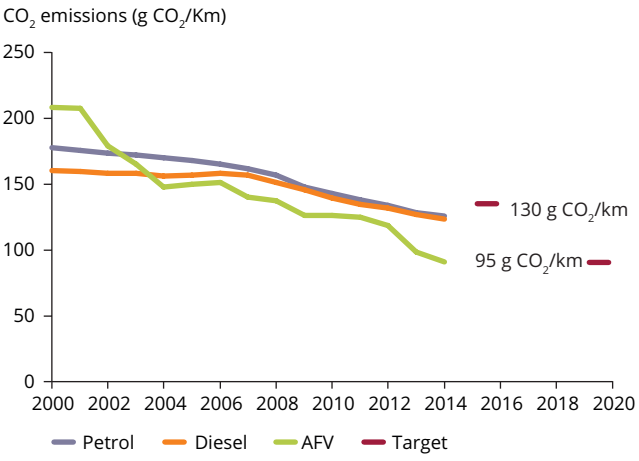


Figure 3.2 Evolution of CO_2 emissions from new passenger cars by fuel type in the EU-28 ([14])



Note: For the calculation of the average CO_2 emissions of AFVs, pure electric, liquefied petroleum gas (LPG), natural gas (NG), ethanol (E85), biodiesel and plug-in hybrid vehicles (diesel-electric or petrol-electric) are all included.

([13]) The geographical scope of the data changes over time from EU-15 to EU-25, EU-27 and EU-28. See Annex 1 for details.
([14]) The geographical scope of the data changes over time from the EU-15 to the EU-25, EU-27 and the EU-28, see Annex 1 for details.

by some 3.4 g CO_2/km, or 2.6%, compared with the previous year (126.7 g CO_2/km in 2013). It is noted that this is the lowest annual decrease since the car emissions legislation came into force. Since 2009, the year in which the cars and CO_2 regulations were introduced, average CO_2 emissions have decreased by 22.3 g CO_2/km.

Average CO_2 emissions have decreased for all engine technologies, and the decrease has been particularly sharp for petrol vehicles since 2005. Compared with 2010, emissions decreased by 3.7 g CO_2/km and 2.8 g CO_2/km, respectively, for diesel and petrol vehicles, meaning that the efficiency gap between the diesel and petrol fleets has remained stable over recent years (Figure 3.2 and Table 3.1). In 2014, an average diesel vehicle emitted 123.2 g CO_2/km, only 2.5 g CO_2/km less than a petrol vehicle (in 2000, the emissions difference between diesel and petrol vehicles was 17.1 g CO_2/km).

The percentage of newly registered vehicles with emissions lower than 100 g CO_2/km had increased significantly since 2013. Almost 18% of newly registered vehicles now emit less than 100 g CO_2/km (Figure 3.3). The number of new passenger cars emitting 101–120 g CO_2/km similarly increased compared with 2013, representing 38% of the total registrations (c.f. 34% in 2013). The distribution of emissions and mass for three selected years (2005, 2010 and 2014) are shown in Figure 3.3. While there is a big difference in terms of emissions performance of vehicles between 2005 and 2014, there were few changes in mass in the same period.

Table 3.1 Evolution of CO_2 emissions from new passenger cars by fuel type in EU-28 ([15])

g CO_2/km	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 ([a])	2011 ([a])	2012 ([a])	2013 ([a])	2014 ([a])
All fuels ([b])	172.2	169.7	167.2	165.5	163.4	162.4	161.3	158.7	153.6	145.7	140.3	135.7	132.2	126.7	123.4
Petrol	177.4	175.3	173.5	171.7	170.0	168.1	164.9	161.6	156.6	147.6	142.5	137.6	133.7	128.5	125.6
Diesel	160.3	159.7	158.1	157.7	156.2	156.5	157.9	156.3	151.2	145.3	139.3	134.5	131.5	126.9	123.2
AFVb ([c])	208.0	207.4	179.2	164.7	147.9	149.4	151.1	140.0	137.0	125.8	126.0	124.7	118.5	98.3	90.8

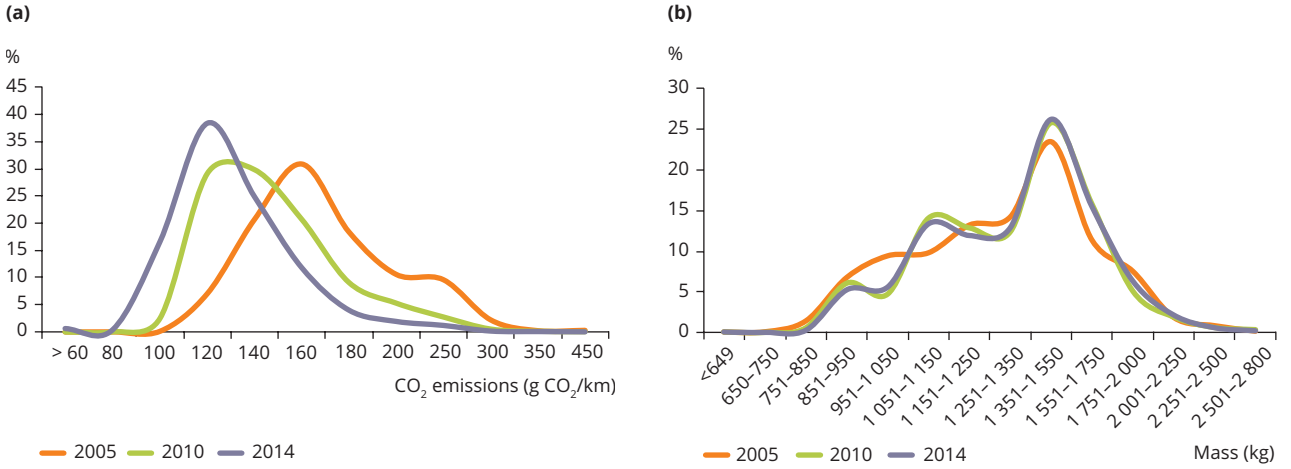
Note: ([a]) The calculation for 2010–2014 was done without considering out-of-scope vehicles.

([b]) Fuel type is available for 95% of the vehicle registrations in 2013.

([c]) AFV, alternative fuel vehicle. For the calculation of the average CO_2 emissions of AFVs, pure electric, liquefied petroleum gas (LPG), natural gas (NG), ethanol (E85), biodiesel and plug-in hybrid vehicles (diesel-electric or petrol-electric) are all included.

([15]) The geographical scope of the data changes over time from the EU-15 to the EU-25, EU-27 and the EU-28, see Annex 1 for details.

Figure 3.3 **Frequency distributions of (a) emissions and (b) mass of vehicles registered in Europe for the years 2005 (data based on decision 1753/2000), 2010 and 2014 (data based on Regulation (EC) No 443/2009)**



In 2014, the average new passenger car in the EU-15 emitted 8.2 g CO_2/km less than the average newly registered vehicle in the EU-13 (Table 3.2). Over the last five years (2010–2014), significant progress was also made in the EU-13. In the preceding 2007–2009 period, the average emissions from new car sales in the EU-13 dropped by 3.6 g CO_2/km, but between 2010 and 2014 the average emissions decreased by 23.2 g CO_2/km, with an average yearly decrease of around 5 g CO_2/km. For the EU-15, the average reduction of CO_2 emissions between 2009 and 2014 (30.5 g CO_2/km) was substantially higher than the reduction in the eight years preceding this period (18.9 g CO_2/km, for the period 2000–2008).

Table 3.2 **Average CO_2 emissions (g CO_2/km) from new passenger cars by region ([16])**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU-28								158.7	153.6	145.7	140.3	135.7	132.2	126.7	123.4
EU-15	172.2	169.7	167.2	165.5	163.7	162.6	161.5	158.8	153.3	145.2	139.9	135.1	131.6	126.1	122.8
EU-13								157.8	156.8	154.2	148.2	144.1	140.9	135.8	131.0

([16]) See box on country groupings page 7.

3.3 Other car characteristics: mass and engine capacity

After two years (2012 and 2013) of new vehicles having higher average masses than the preceding years, a lower average mass (1 375 kg) was reported for new cars sold in 2014 (Table 3.3). While the mass of petrol vehicles has been stable over the last 10 years, the mass of diesel vehicles has increased consistently, although with a slight decrease in the last years. This has meant the difference in mass between petrol and diesel vehicles has increased steadily from 2004 (226 kg) to 2014 (310 kg). The mass of alternative fuel vehicles (AFVs) varies over the years. During this period, CO_2 emissions decreased significantly. Figure 3.4 shows the relationship between changes in average emissions and average mass according to fuel type. It is noted that the average mass of petrol vehicles has decreased, together with emissions, whereas, in contrast, the average mass of diesel vehicles has increased since 2004, despite the decrease of emissions over the same period.

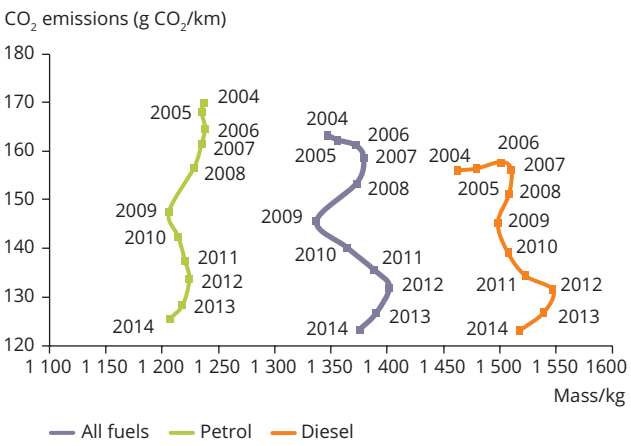
With respect to average engine capacity, there was a slight decrease in the last four years, with the average engine capacity of new passenger cars in 2014 being 37 cm^3 lower than in 2011. The difference between new diesel and petrol vehicles is around 447 cm^3, with diesel higher, while in 2011 the difference was 372 cm^3. In the same period, the average engine power, however, increased from 86 to 90 kW. This means that manufacturers are generally producing more powerful cars (i.e. achieving higher engine power in terms of kW), even if they are using smaller engine capacities.

Table 3.3 Average mass (kg) of new passenger cars by fuel ([17])

	2004	2005	2006	2007	2008	2009	2010	2011	2012 ([a])	2013 ([a])	2014 ([a])
All fuels	1 347	1 356	1 372	1 379	1 373	1 337	1 364	1 388	1 402	1 390	1 375
Petrol	1 237	1 235	1 238	1 235	1 228	1 206	1 214	1 220	1 224	1 218	1 207
Diesel	1 463	1 479	1 501	1 510	1 508	1 498	1 507	1 523	1 547	1 539	1 518
AFV	1 415	1 404	1 392	1 271	1 237	1 169	1 202	1 270	1 247	1 294	1 343

Note: ([a]) For the calculation of the average mass of AFVs, pure electric, liquefied petroleum gas (LPG), natural gas (NG), ethanol (E85), biodiesel and plug-in hybrid vehicles are all included.

Figure 3.4 CO_2 emissions versus vehicles' mass in the EU-28



([17]) Data before 2004 are not shown because of an incomplete data set.

3.4 Vehicle technologies

In 2014, more diesel vehicles continued to be sold than petrol ones. Diesel vehicles represented 53% of new vehicles, compared with 55.2% in 2011 — the year in which the sales percentage of diesel was at a maximum (Table 3.4). The percentage of AFVs increased between 2011 and 2014, until reaching 2.7%. Even if it is a positive sign, the vast majority of Europe's new cars remain powered by petrol or diesel engines.

The registration of AFVs has increased substantially since 2000 (Figure 3.5). This category included only a few vehicles in 2000, but registrations exceeded half a million new vehicles in 2009, before dropping to slightly less than half a million in 2010. The registration of AFVs also increased considerably by 58% (97% if plug-in hybrid vehicles are included in the statistics) between 2011 and 2014, after a significant drop between 2010 and 2011 (when registrations fell by 62%).

On the basis of the monitoring data, it is also possible to report CO_2 emissions for different fuel types used by AFVs (Table 3.5). It is noted that the mix of vehicles considered in the AFV categories has changed over the years (natural gas (NG) vehicles, liquefied petroleum gas (LPG) vehicles, biodiesel vehicles, ethanol (E85) vehicles, electric vehicles and plug-in hybrid vehicles are included in this category). This helps explain the high variability in the trend of emissions and other characteristics of the AFV fleet (Figure 3.2). In the early 2000s, AFVs were dominated by dual-fuel vehicles, i.e. vehicles mostly able to operate on petrol and ethanol blends. This trend gradually changed owing to the introduction of LPG vehicles and NG vehicles, which have since greatly outnumbered ethanol cars. The significant reduction in CO_2 emissions from AFVs over the past few years is not uniquely the result of improvements in technology, but has also been caused by shifts in fuel composition and engine type. In 2014, the increase in the number of pure electric vehicles and plug-in hybrid vehicles contributed to the declining emission levels. Pure electric vehicles are propelled by electric motors, using electrical energy stored in batteries or other energy storage devices. The tail-pipe emissions of this kind of vehicle are considered to be 0 g CO_2/km. It is important to mention that only tail-pipe emissions ([19]) are included in the data set. In 2014, there were 13 700 more registrations of electric vehicles than in 2013, representing 0.3% of the fleet. Plug-in hybrid vehicles are also identified in the database. These vehicles have both an internal combustion engine and an electric motor, but the power provided to the wheels is provided only by the electric motor. The combustion engine is used only to power a generator that drives the electric motor. The average emissions of plug-in vehicles are, in general, below 70 g CO_2/km. Registrations of plug-in hybrid vehicles have increased: in 2014, approximately 70 000 plug-in vehicles were registered in Europe. Together with electric vehicles, they represent 0.8% of the fleet. Hybrid vehicles are included in the data set under the category of petrol or diesel vehicle, so it is not possible to distinguish them on the basis of fuel types.

Of the other types of AFVs, NG and LPG vehicles had the lowest CO_2 emissions (120.3 g CO_2/km and 97.8 g CO_2/km, respectively), whereas ethanol-fuelled vehicles (E85) had the highest emissions (143.9 g CO_2/km). The improvements of these technologies is marginal compared with 2013, when NG and LPG vehicles emitted, respectively, 120.5 and 101.1 g CO_2/km.

Italy was the country with the highest percentage of AFVs (mainly LPG and NG vehicles; 16% of all Italian registrations were AFVs). For each of the other European countries, the proportion of LPG and NG vehicles was below 1.8%. The number of pure electric vehicles in the EU-28 increased from around 700 in 2010 to around 38 000 in 2014. France (more

Table 3.4 Share of fuel type in new passenger cars (EU-28) ([18])

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 ([a])	2011 ([a])	2012 ([a])	2013 ([a])	2014 ([a])
Petrol	68.9	64.0	59.2	55.5	51.9	50.7	49.4	47.3	47.4	51.1	45.3	43.4	43.0	45.1	44.3
Diesel	31.0	35.9	40.7	44.4	47.9	49.1	50.3	51.9	51.3	45.1	51.3	55.2	54.9	52.5	53.0
AFV	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.7	1.3	3.8	3.5	1.4	2.2	2.4	2.7

Note: ([a]) The calculation for the period 2010–2014 was done without considering out-of-scope vehicles.

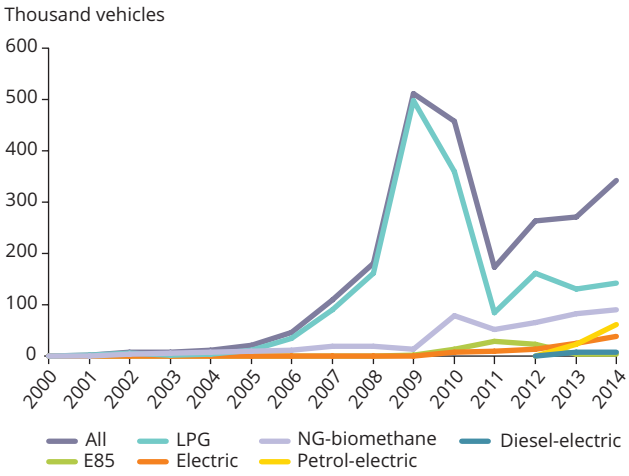
([18]) The geographical scope of the data changes over time from the EU-15 to the EU-25, EU-27 and EU-28, see Annex 1 for details.
([19]) Tail-pipe emissions are the exhaust emissions of the vehicles. There are no end-of-pipe emissions for pure electric vehicles. However, pure electric vehicles produce indirect emissions when they are plugged into the electricity grid. These indirect emissions are not taken into account in this report or in the regulation.

Table 3.5 AFV data ([20]): Number of registrations, CO_2 emissions (g CO_2/km), mass (kg) and engine capacity (cm^3)

	Registration	Average CO_2 emissions (g CO_2/km)	Average mass (kg)	Average engine capacity (cm^3)
E85	3 296	143.9	1 430	1 631
Electric ([a])	37 855	-	1 510	1 798
LPG	142 534	120.3	1 213	1 328
NG-biomethane	90 378	97.8	1 286	1 158
Petrol-electric	60 845	66.9	1 556	1 764
Diesel-electric	7 335	69.0	1 899	2 274

Note: ([a]) Electric vehicles are vehicles for which tail-pipe emissions are 0 g CO_2/km.

Figure 3.5 Evolution of total registrations of AFVs



than 10 700 vehicles), Germany (around 8 600 vehicles) and the United Kingdom (almost 7 000 vehicles) are the countries for which the increase was highest between 2010 and 2014. The number of plug-in hybrid vehicles has considerably increased in the Netherlands: in 2014 they represented almost 7% of the fleet. A significant number of plug-in vehicles were registered in Italy (around 21 000 vehicles) and the United Kingdom (around 8 000 vehicles) as well.

3.5 Comparison between Member States

In all EU Member States, the CO_2 emissions from newly registered passenger cars fell in 2014 compared with 2013. Figure 3.6 shows the absolute reductions in Member States between 2014 and 2013 and between 2014 and 2010, and the percentage variations over the same periods.

Eighteen Member States had average CO_2 emissions from newly registered cars already below the 130 g CO_2/km EU target set for 2015 (Figure 3.7). Of these, 10 had emission values below 120 g CO_2/km and three had values below 110 g CO_2/km ([21]).

For some of these Member States (Denmark, Greece, Malta and the Netherlands), the low average emissions were mainly related to the registration of relatively small cars: the average mass of the new fleet of these countries was below 1 300 kg. In addition, Denmark, Greece and Malta have the lowest engine capacities in Europe. Denmark and Greece also have the lowest average engine power values, followed by Italy, Croatia and France.

The share of diesel vehicles can also lower average CO_2 emissions in the newly registered vehicle fleet. The percentage of diesel vehicles of new cars varies among Member States: in Ireland, Luxembourg and Portugal, the percentage of diesel vehicles is higher than 70%.

([20]) Only exhaust emissions are considered. For pure electric vehicles the emission is null. For petrol-E85, the petrol CO_2 emissions are reported, for LPG and NG (natural gas) the respective LPG and CNG CO_2 emissions are reported.
([21]) According to Regulation (EC) No 443/2009, the new cars registered in the EU as a whole do not have to emit more than an average of 130 g CO_2/km by 2015.

In contrast, less than 35% of vehicle registrations in Denmark, the Netherlands and Poland in 2014 were diesel vehicles.

Croatia and Cyprus recorded the largest annual relative CO_2 emission reductions in newly registered cars, which were about 9 and 7% on average compared with the previous year.

Owing to their size, the Member States with higher numbers of vehicle registrations — France, Germany, Italy, Spain and the United Kingdom — are not surprisingly the major contributors to the total reductions in the EU-28 CO_2 emissions from newly registered passenger cars. Of these countries, France, Italy and Spain have the lowest average CO_2 emissions. For Italy, this is the result of a combination of reasons. Italy, like Denmark, Greece, Malta and the Netherlands, has one of the lowest average masses (the fifth lowest among the EU Member States) and one of the lowest engine power values (third lowest value among those Member States reporting engine power). In addition to this, Italy has a high share of diesel cars (54%) and by far the highest share of AFVs (16%). The latter are mainly LPG cars (9% of all new registrations) with an average CO_2 value of 119 g CO_2/km — comparable to the average diesel emissions in Italy — and NG cars (5% of all new registrations) with an average CO_2 value of 97 g CO_2/km. For France, it seems that dieselisation (the introduction of more diesel vehicles) is the main reason for the low CO_2 emissions, with the fourth-highest share of new diesel cars (64%) among the EU Member States. France also has a relatively high share of pure electric cars (0.6%) with zero emissions. On the other side of the scale, Germany has one of the highest CO_2 emissions: its fleet is significantly heavier (1 443 vs. 1 376 kg) and more powerful than the EU average (102 vs. 90 kW).

Figure 3.6 Absolute and relative reduction (%) of emissions by Member States for the periods 2013–2014 and 20103–2014

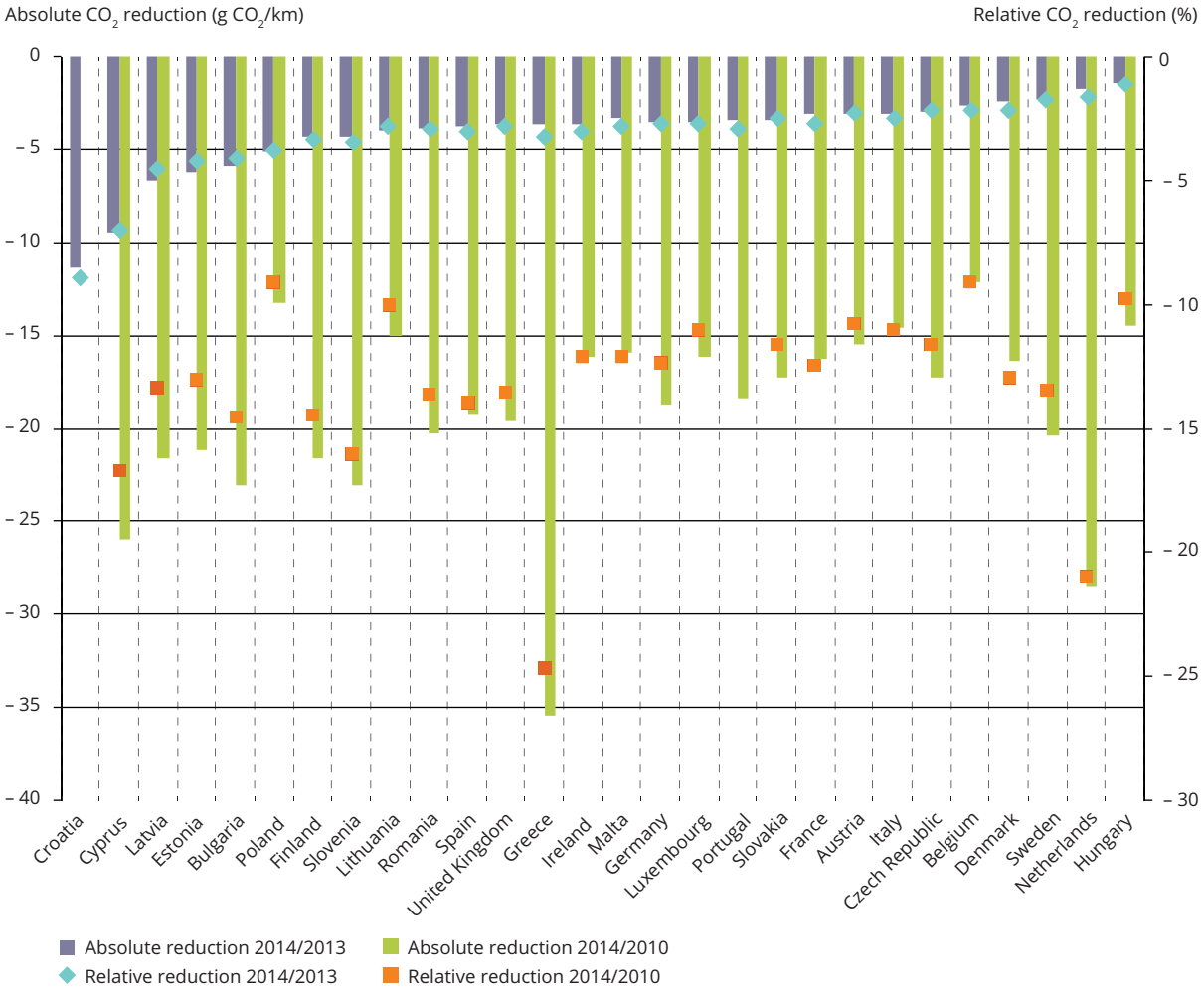
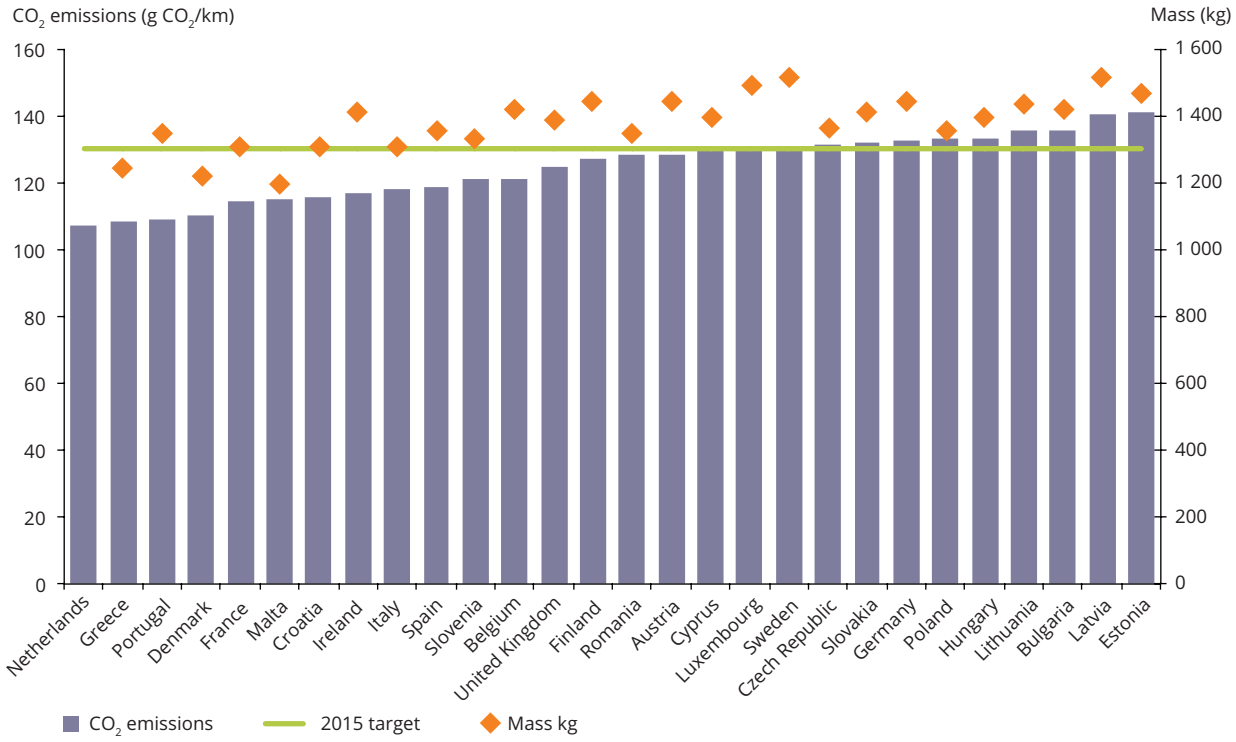


Figure 3.7 Average CO_2 emissions and average mass by EU Member State in 2014



Note: The 2015 target is the target for the average fleet of new cars in the EU as a whole.

3.6 CO_2 emissions from car manufacturers in 2014

Table 3.6 presents data (number of registrations, average mass and average emissions) for large manufacturers, i.e. those that registered more than 100 000 vehicles in 2014. In total, these manufacturers sold around 12.1 million vehicles in the EU-28 in 2014, equivalent to 96.3% of the total new registrations. The average emissions of these manufacturers in previous years (2009–2012) are also included in the table.

The European fleet is quite diverse in terms of brands. The most popular brand is Volkswagen AG, with 13% of the vehicles registered in Europe in 2014. Eight per cent of the fleet is composed of Ford vehicles. Renault, Adam Opel AG and Bayerische Motoren Werke (BMW) follow, with a 7% contribution each.

The average EU emission across all manufacturers in 2014 was 123.4 g CO_2/km. The average CO_2 emission of the large manufacturers was 122.4 g CO_2/km, i.e. 1.0 g CO_2/km lower than the average of the total new registrations.

In 2014, 16 large manufacturers had average emissions lower than 130 g CO_2/km, whereas in 2013 only 13 manufacturers were below this value. The average emissions of those large manufacturers varied from 108.4 g CO_2/km to 178.4 g CO_2/km. Eight of those manufacturers had average emissions below 120 g CO_2/km: Renault, Automobiles Peugeot, Automobiles Citroen, Toyota Motor Europe NV SA, Hyundai Assan Otomotiv Sanayi VE, Nissan International SA, Fiat Group Automobiles Spa and Seat SA.

Renault had the lowest average CO_2 emissions (below 110 g CO_2/km) of the large manufacturers. Since 2012, Renault's average emissions decreased by almost 12.5 g CO_2/km. In 2014, 93% of Renault vehicles emitted less than 130 g/km (Figure 3.10). Renault had the highest percentage of vehicles with emissions below 95 g CO_2/km (34%). Of those, 3.5% were electric vehicles with zero emissions. As well as Renault, Toyota Motor Europe NV SA continues to produce some of the lowest-emitting cars; one-third of their fleet had emissions below 95 g CO_2/km (31%). Of the Toyota Motor Europe NV SA fleet, 70% is petrol vehicles with very low average

emissions (110 g CO_2/km). In addition, 6% of the fleet are plug-in vehicles with average emission of 86.2 g CO_2/km.

Automobiles Peugeot and Automobiles Citroen have both improved their performance compared with 2013 by 5 g CO_2/km. Downsizing, i.e. a shift to smaller and lighter vehicles, has been one of the drivers for this reduction — the average mass of vehicles sold by those companies decreased by 78 and 88 kg, respectively.

Hyundai Assan Otomotiv Sanayi VE had the lowest mass in the group (1 070 kg). However, its average emission increased compared with 2013. Ninety per cent of its fleet is petrol vehicles, the highest percentage observed in the group of large manufacturers.

Nissan International SA made significant improvements in a single year. Its average emission decreased by almost 16 g CO_2/km compared with 2013. This good performance is related to the increased number of electric vehicles in the share of new cars sold (which overall corresponds to a CO_2 saving of 3 g CO_2/km), to the sale of smaller vehicles (40 kg lighter than in 2013) and to the improved performances of the conventional vehicles (the percentage of vehicles emitting less than 130 g CO_2/km was 86% in 2014, compared with 56% in 2013).

During the period 2000–2014, Fiat Group Automobiles Spa showed a 26% reduction in the CO_2 emissions of new cars registered in the EU. As in previous years, in 2014, Fiat Group Automobiles Spa had one of the lowest average car masses among the large manufacturers (1 143 kg). The share of AFVs in Fiat's new car sales, notably those that run on LPG and NG, has also contributed to the observed emissions reduction since 2000. The newly registered LPG and NG passenger cars in 2009 constituted slightly more than 19% of the total new registrations of Fiat Group Automobiles Spa. This share decreased to 14% in 2014. On average, NG vehicles registered in Italy emitted 97.5 g CO_2/km, while LPG vehicles emitted 115.0 g CO_2/km, around 4.5 g CO_2/km less than average petrol vehicles registered in Italy. Owing to the emissions of NG and LPG vehicles becoming more comparable to those of conventional vehicles (the average diesel emission is 112.9 g CO_2/km), Fiat Group Automobiles Spa's performance did not improve in the last year, with its new vehicles emitting on average 116 g CO_2/km, the same as in 2013 and only 1 g CO_2/km less than in 2012.

Seat SA has achieved a significant reduction (10 g CO_2/km) in its average emissions between 2012 and 2014, reaching 117 g CO_2/km. Like Fiat Group Automobiles Spa and Hyundai Assan Otomotiv Sanayi VE, Seat SA has one of the lowest average car masses among the large manufacturers (1 242 kg) and a high share of AFVs (10%), which are mostly NG vehicles (with an average emission of 83.2 g CO_2/km).

The majority of large manufacturers in this group saw a decrease in their average emission levels in 2014 compared with 2013. The largest reductions in average emissions were achieved by Nissan International SA (15.8 g CO_2/km), Honda of the UK Manufacturing LTD (10.7 g CO_2/km) and Mazda Motor Corporation (5.9 g CO_2/km). These decreases ensured that Mazda Motor Corporation and Nissan International SA reached the 130 g CO_2/km threshold (128 g CO_2/km). The average emission of Honda of the UK Manufacturing LTD was above this threshold. Since 2009, when the car emissions legislation came into force, the largest emission reductions have been reported by Volvo Car Corporation, Nissan International SA and Daimler AG (47, 39 and 35 g CO_2/km, respectively).

Over the years, certain manufacturers, notably the Fiat Group Automobiles Spa, have more or less followed the overall trend of the average performance of the European fleet. However, some manufacturers showed a better emission reduction trend than the average emissions reduction of all EU new registrations. For example, the average CO_2 emissions of BMW, Toyota Motor Europe NV SA, Renault and Daimler AG have decreased by more than 33% since 2000 (compared with an average decrease in emissions of 28% across the European fleet as a whole). The opposite situation is observed for Adam Opel AG and Volkswagen AG: for these manufacturers, the emission reduction is lower than the reduction made in the average fleet (15 and 24%, respectively). For some manufacturers, the average emissions did not follow a uniform path. For example, Toyota Motor Europe NV SA's emissions performance improved at a slower pace than the European average in the period 2000–2005, but it surpassed the European average during the period 2006–2014. The opposite was observed for Volkswagen AG, which performed better than the European average in the period 2000–2004, but saw smaller improvements than the average from 2007 to 2014.

Table 3.6 Main specific emission statistics for the largest car manufacturers (>100 000 vehicle registrations per year), ordered by average CO_2 emissions in 2014)

Manufacturer	Registrations 2014 (a)	Average mass (kg) 2014	Average CO_2 (g CO_2/km)				
			2014	2013	2012	2011	2010
Renault SAS	871 328	1 250	108	110	121	129	134
Automobiles Peugeot	766 531	1 270	110	115	121	128	131
Automobiles Citroen	594 263	1 268	111	116	123	126	131
Toyota Motor Europe NV SA	538 723	1 310	113	116	122	126	129
Hyundai Assan Otomotiv Sanayi VE (b)	120 988	1 070	113	112			
Nissan International SA	469 215	1 351	115	131	137	142	147
Fiat Group Automobiles SPA	666 763	1 143	116	116	117	118	125
Seat SA	316 546	1 242	117	119	127	125	131
Skoda Auto AS	546 145	1 276	121	125	132	135	139
Ford-Werke GmbH	939 565	1 316	121	122	129	132	137
Magyar Suzuki Corporation Ltd	108 700	1 147	123	126	128	128	137
Volkswagen AG	1 549 656	1 384	124	127	133	135	140
Kia Motors Corporation	216 352	1 293	125	128	129	137	143
Automobile Dacia SA	372 685	1 206	125	127	137	143	145
Volvo Car Corporation	234 160	1 676	126	131	142	151	157
Mazda Motor Corporation	159 721	1 407	128	134	142	147	149
Adam Opel AG	860 970	1 405	130	132	133	134	140
Bayerische Motoren Werke AG	791 579	1 579	131	134	138	144	146
Audi AG	683 782	1 558	131	133	138	145	152
Daimler AG	685 986	1 579	131	137	143	153	160
Honda of the UK Manufacturing Ltd	111 222	1 437	134	145	156	161	162
Hyundai Motor Manufacturing Czech SRO (b)	200 750	1 440	140	138			
Kia Motors Slovakia SRO (c)	130 606	1 449	141	140			
Jaguar Land Rover Limited (d)	140 264	2 044	178	182			

Note: (a) These are the total number of registrations in the EU-28, not the registrations used for the calculation of the target and of the average emissions (see Annex 1).

(b) In previous years, Hyundai appeared as a unique manufacturer.

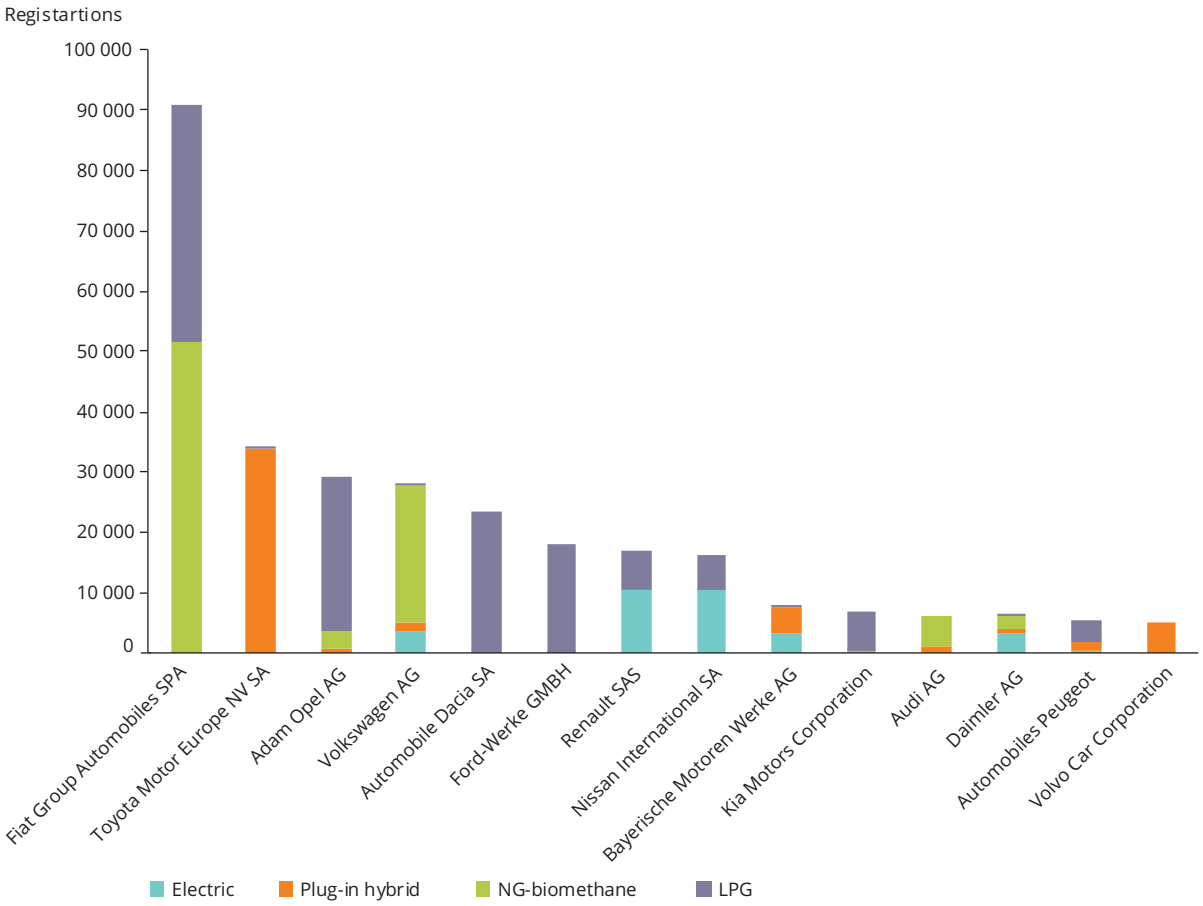
(c) In previous years, Kia appeared as a unique manufacturer.

(d) In previous years, Jaguar and Land Rover appeared as two independent manufacturers.

In the EU-28, registrations of diesel vehicles have increased consistently over the years, although, for certain manufacturers, their share of diesel cars has stabilised since 2009 (Figure 3.9). In a recent evaluation of Regulations No 443/2009 and No 510/2011 published by the European Commission, no conclusive evidence was found that the regulations themselves are primarily responsible for the increased uptake of diesel vehicles in Europe; national vehicle registration taxes and consumer preferences appear to be more important factors (EC, 2015a). Despite the increasing trend, the share of AFVs remains low in absolute terms, and hence has not contributed significantly to the observed emission reductions. However, in 2014, the contribution of AFVs was becoming increasingly important for some manufacturers, accounting for more than 6% of registrations for Dacia, Toyota and Fiat, for example (Figure 3.8).

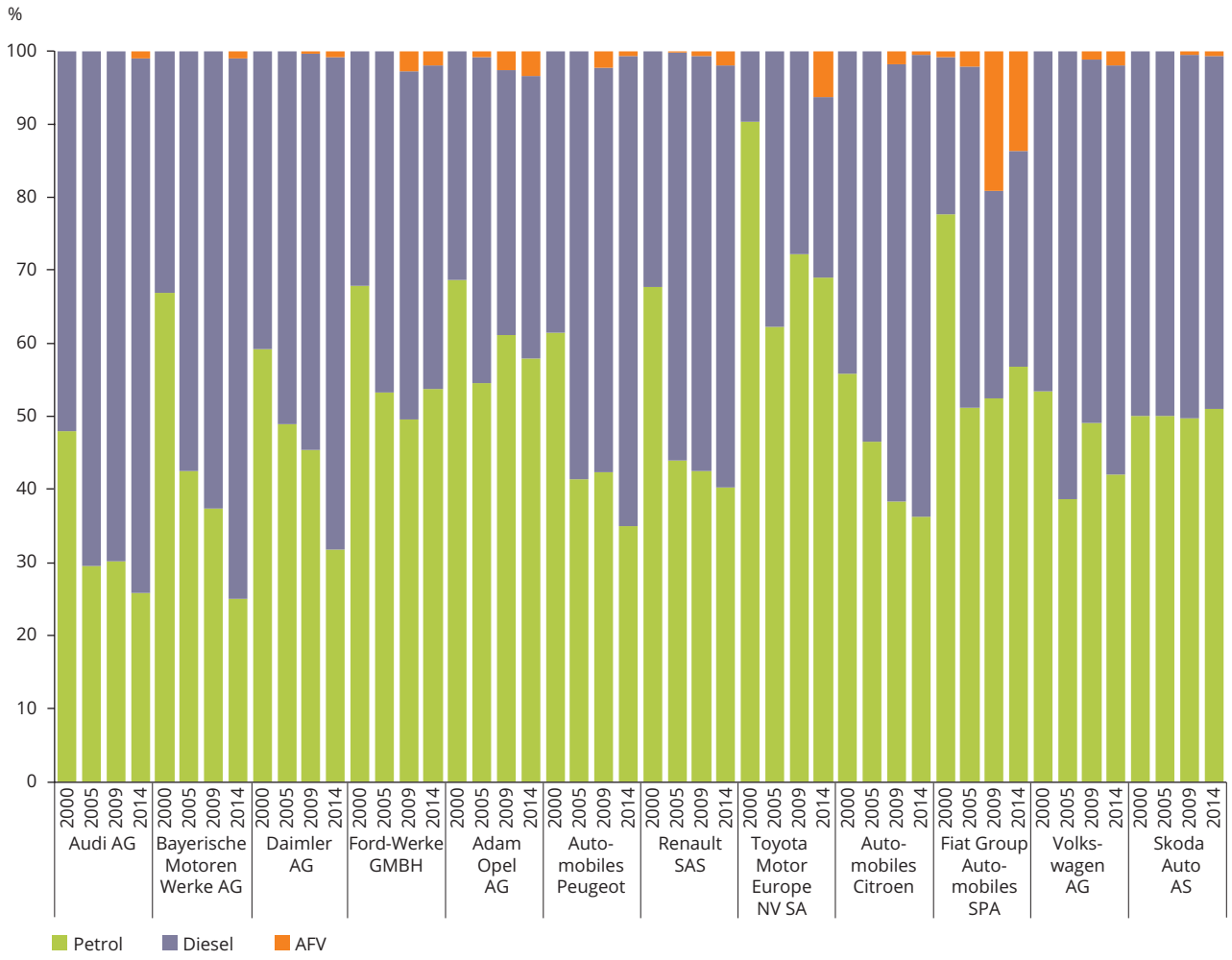
The distribution of registrations over different emissions classes (Figure 3.10) shows that, for some manufacturers (Nissan, Volvo and Renault), the market for very low-emitting vehicles (below 50 g CO_2/km) is increasing. However, even for those manufacturers, the percentage of electric vehicles remains lower than 2.5% of new car sales. For Toyota and Renault, the percentage of vehicles emitting less than 95 g/km is relatively high, being 31 and 34%, respectively. Vehicles with emissions below 130 g CO_2/km account for the largest share of registrations for all the large manufacturers (70% on average). For only a few manufacturers (Hyundai Motor Manufacturing Czech SRO, Kia Motors Slovakia SRO and Jaguar Land Rover Limited) did the majority of vehicles sold emit more 130 g CO_2/km.

Figure 3.8 Number of registrations of AFVs for the large manufacturers ([22])



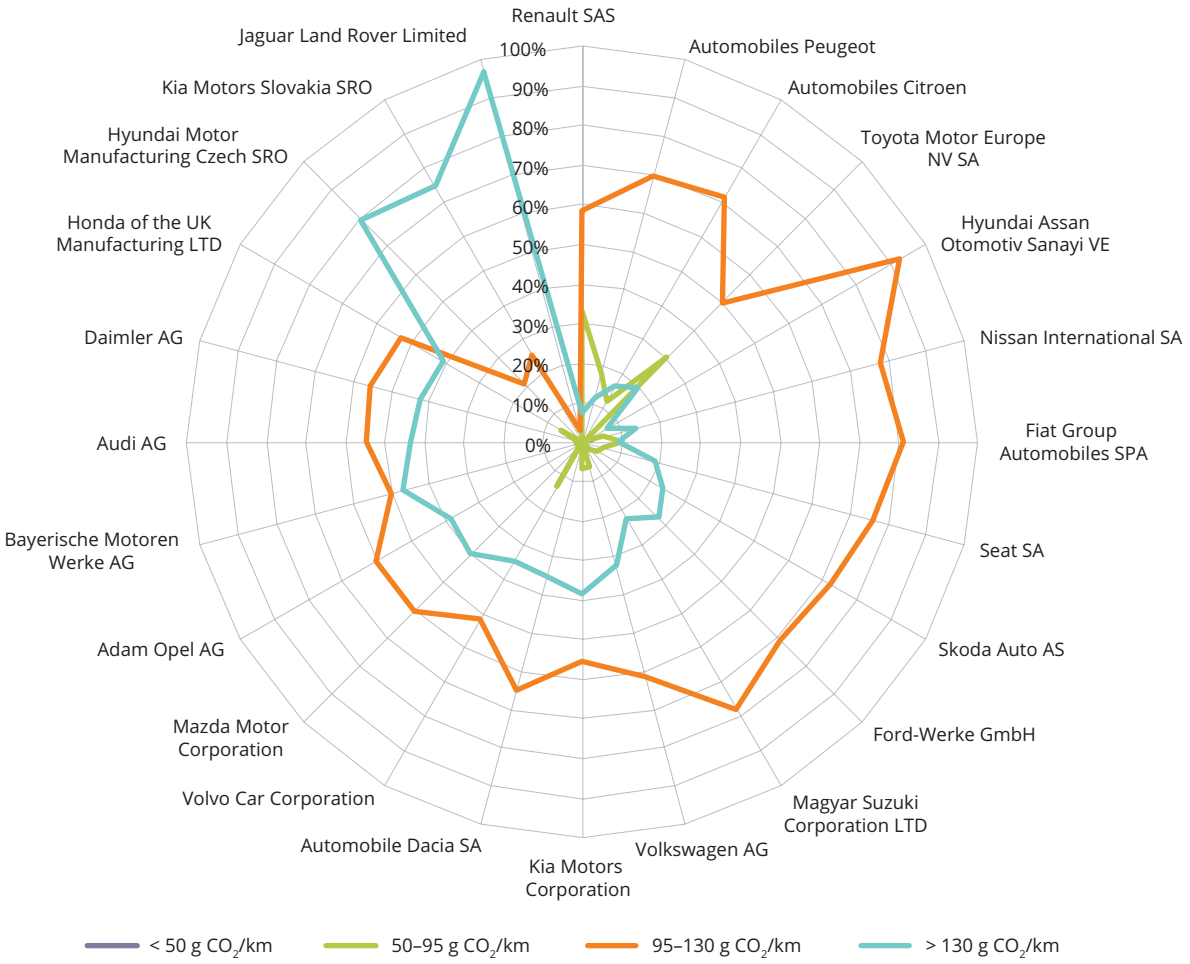
([22]) Data are presented only for the large manufacturers that sells more than 4 000 alternative fuelled vehicles per year.

Figure 3.9 **Share of new sales by fuel type for the largest manufacturers (> 500 000 vehicle registrations per year) ([23])**



([23]) Data for the time period 2001–2009 were gathered via the monitoring regulated by Decision 1753/2000/EC, which was repealed by Regulation (EC) No 443/2009. These data do not include all Member States in all years. Manufacturers' names and groups may have changed during the time period shown. Moreover, owing to changes in methodology and monitoring improvements, breaks in trends may occur.

Figure 3.10 Percentage of registrations in different emission classes for the large manufacturers



3.7 Distance to the 2014 target

The distance of manufacturers to their specific emissions targets is calculated by taking into account the permitted adjustments listed in Chapter 2 (i.e. phase-in, super-credits, E85 extra credits and eco-innovations).

Based on their average CO_2 emissions in 2014, 57 manufacturers out of 92, representing 96% of the total registrations in the EU, achieved their specific emissions targets for 2014 (including derogations). Taking into account the pools, 76 manufacturers out of 94 achieved their targets.

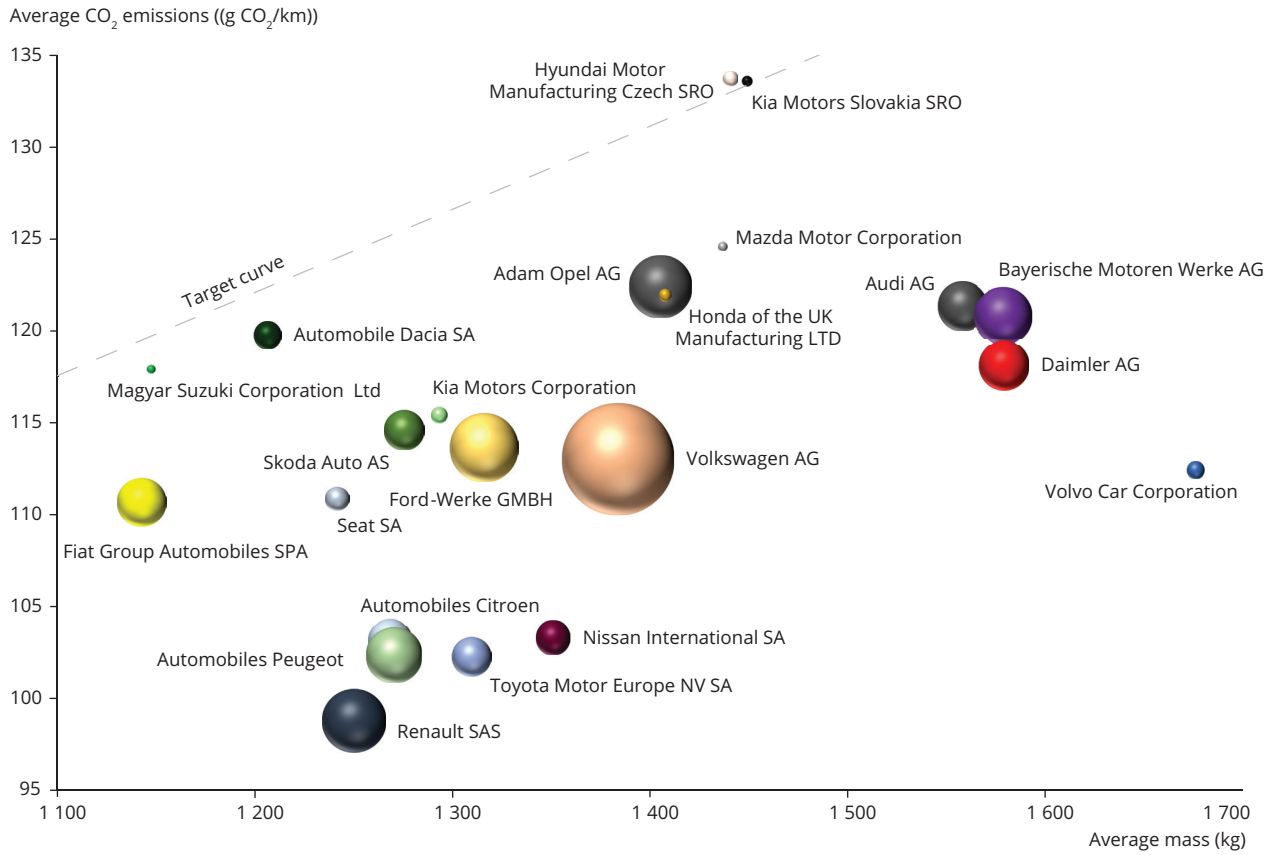
Some manufactures fall within the scope of the de minimis threshold, according to which manufacturers with fewer than 1 000 registrations may be exempt from achieving a specific emissions target. In total, there were 22 manufacturers with fewer than 4 100 vehicles registered in 2014 that benefited from the de minimis exemption. The data are available in Annex 2.

Figure 3.11 shows the distance to target for the manufacturers that registered more than 100 000 vehicles in 2014. Over the years, the majority of large manufacturers have been able to improve their performance, and have decreased their emission levels below their targets. In 2014, only two manufacturers did not reach their targets, but both their pools met their limits. The manufacturer most above its target was Hyundai Motor Manufacturing Czech (by 0.6 g CO_2/km), whereas the manufacturer most below its target was Volvo (31.5 g CO_2/km). All relevant data are included in Annex 1. For 2014, the pool for Tata, Jaguar Land Rover and Mazda was granted a niche derogation. Therefore, the target for this pool was not calculated on the basis of formula (1) in Chapter 2.

As explained in Chapter 2, the limit value curve implies that heavier cars are allowed higher emissions than lighter cars. As a result, the specific CO_2 emission targets of large manufacturers range from 116 to 178 g CO_2/km.

The distance to target for pools of manufacturers is presented in Table 3.7. In 2014, all of the pools respected their specific emissions targets.

Figure 3.11 Distance to 2014 target by individual manufacturers (only manufacturers with > 100 000 new vehicles registered)



Note: The size of the bubble is proportional to the number of new vehicles registered in the EU-28 in 2014.

For reasons of scale, data for Jaguar Land Rover Limited is not shown on the chart. Its average mass is 2044 kg and its average CO_2 emissions are 165.435 g CO_2/km.

Table 3.7 Distance to target for the pools in 2014

Pool	Manufacturer	Average Emissions (g CO_2/km)	Target (g CO_2/km)	Distance To Target (g CO_2/km)
	Bayerische Motoren Werke AG	121	139	– 19
	BMW M GmbH	201	147	54
	Rolls-Royce Motor Cars Ltd	326	181	146
BMW Group		121	140	– 18
	Daimler AG	118	139	– 21
	Mercedes-AMG GmbH	261	145	116
Daimler AG		118	139	– 21
	Chrysler Group LLC	171	159	12
	Fiat Group Automobiles SPA	111	120	– 8.8
	Maserati SPA	191	157	33
Fiat Group Automobiles SPA		112	123	– 11
	Ford-Werke GMBH	114	127	– 14
	Ford Motor Company	102	134	– 32
	CNG-Technik GmbH	0	144	– 144
Ford-Werke GmbH		114	127	– 14
	Chevrolet Italia SPA	113	118	– 5.2
	General Motors Company	167	137	30
	GM Korea Company	125	131	– 6.6
	Adam Opel AG	122	132	– 9.1
General Motors		123	132	– 9.0
	Honda Automobile China Co Ltd	124	120	4.4
	Honda Motor Co Ltd	122	132	– 9.4
	Honda of the UK Manufacturing Ltd	125	133	– 8.3
	Honda Turkiye AS	155	126	28
Honda Motor Europe Ltd		124	132	– 8.0
	Hyundai Motor Company	126	137	– 11
	Hyundai Assan Otomotiv Sanayi VE	110	116	– 5.7
	Hyundai Motor Manufacturing Czech SRO	134	133	0.6
	Hyundai Motor India Ltd	111	116	– 5.3
Hyundai		122	128	– 5.8
	Kia Motors Corporation	115	126	– 11
	Kia Motors Slovakia SRO	134	134	0.1
Kia		122	129	– 6.8
	Mitsubishi Motors Corporation MMC	86	144	– 58
	Mitsubishi Motors Europe bv MME	133	133	– 0.6
	Mitsubishi Motors Thailand CO Ltd	96	110	– 14
Mitsubishi Motors		85	136	– 51
	Lada France	179	129	50
	Automobile Dacia SA	120	122	– 2.6
	Renault SAS	99	124	– 26
Pool Renault		104	124	– 19
	Suzuki Motor Corporation	164	123.11	41
	Maruti Suzuki India Ltd	98	123.11	– 25
	Magyar Suzuki Corporation Ltd	118	123.11	– 5.2
	Suzuki Motor Thailand Co Ltd	99	123.11	– 24
Suzuki Pool		115	123	– 8.2
	Jaguar Land Rover Limited	165	178	– 13
	Tata Motors Limited	133	178	– 45
Tata Motors Ltd, Jaguar Land Rover		165	178	– 13
	Audi AG	121	138	– 17
	Audi Hungaria Motor KFT	145	132	13
	Bentley Motors Ltd	285	182	104
	Bugatti Automobiles SAS	553	160	392
	Automobili LamborghinI SPA	317	144	173
	Dr Ing HCF Porsche AG	182	152	30
	Quattro GMBH	226	153	73
	Seat SA	111	124	– 13
	Skoda Auto AS	115	126	– 11
	Volkswagen AG	113	131	– 18
VW Group PC		115	131	– 16

3.8 Effect of super-credits on large manufacturers' average emissions

Regulation (EC) No 443/2009 provides incentives to car manufacturers to produce vehicles with very low emissions (i.e. below 50 g CO_2/km). As explained in Chapter 2, each low-emitting car was counted as 2.5 vehicles in 2014 for the purposes of the calculation of the fleet average.

Table 3.8 summarises the average emissions calculated, including and excluding the super-credits for the 24 large manufacturers. It is noted that, even when excluding the super-credits from the calculation of the CO_2 average emissions, all of the large manufacturers, which were respecting the target including super-credits, achieved their 2014 target. The effect of the super-credits on the average emissions of new cars is below 4.5 g CO_2/km.

Even if the number of low-emitting vehicles increases in the future, the effect of super-credits on CO_2 specific emissions will decrease because the credits decrease annually, i.e. low-emitting cars will be counted as 1.5 vehicles in 2015 and as 1 car from 2016 to 2019.

Table 3.8 Performance of the manufacturers that registered more than 100 000 vehicles in 2014 including and excluding super-credits adjustments

Manufacturer	CO_2 specific emissions	Target	Distance to target	CO_2 specific emissions — no super credit	Distance to target — no super credit	Difference with or without super credit
Audi AG	121.362	138	– 17.137	121.568	– 16.931	0.206
Automobiles Citroen	103.142	125	– 22.120	103.218	– 22.044	0.076
Automobiles Peugeot	102.376	125	– 22.972	102.439	– 22.909	0.063
Bayerische Motoren Werke AG	120.841	139	– 18.605	122.761	– 16.685	1.920
Automobile Dacia SA	119.789	122	– 2.641	119.789	– 2.641	0
Daimler AG	118.152	139	– 21.308	119.167	– 20.293	1.015
Fiat Group Automobiles SPA	110.682	120	– 8.838	110.682	– 8.838	0
Ford-Werke GmbH	113.657	127	– 13.776	113.666	– 13.767	0.009
Honda of the UK Manufacturing Ltd	124.614	133	– 8.340	124.614	– 8.340	0
Hyundai Assan Otomotiv Sanayi VE	110.465	116	– 5.711	110.465	– 5.711	0
Hyundai Motor Manufacturing Czech SRO	133.734	133	0.606	133.734	0.606	0
Jaguar Land Rover Limited	165.435	178	– 12.590	165.435	– 12.590	0
Kia Motors Corporation	115.439	126	– 10.964	115.595	– 10.808	0.156
Kia Motors Slovakia SRO	133.612	134	0.094	133.612	0.094	0
Magyar Suzuki Corporation Ltd	117.932	123	– 5.182	117.932	– 5.182	0
Mazda Motor Corporation	121.968	129	– 7.458	121.968	– 7.458	0
Nissan International SA	103.312	129	– 25.719	107.657	– 21.374	4.345
Adam Opel AG	122.425	132	– 9.093	122.573	– 8.945	0.148
Renault SAS	98.779	124	– 25.648	101.005	– 23.422	2.226
Seat SA	110.877	124	– 13.162	110.877	– 13.162	0
Skoda Auto AS	114.628	126	– 10.963	114.628	– 10.963	0
Toyota Motor Europe NV SA	102.286	127	– 24.860	102.484	– 24.662	0.198
Volkswagen AG	113.030	131	– 17.502	113.627	– 16.905	0.597
Volvo Car Corporation	112.433	144	– 31.453	113.912	– 29.974	1.479

Note: If the difference is 0.000, the manufacturer does not produce low emitting vehicles (<50 g CO_2/km).

3.9 Distance to the 2015 and 2021 targets

The distance of the largest manufacturers (i.e. manufacturers registering more than 100 000 vehicles per year) to their targets is calculated based on the 2014 CO_2 emission data.

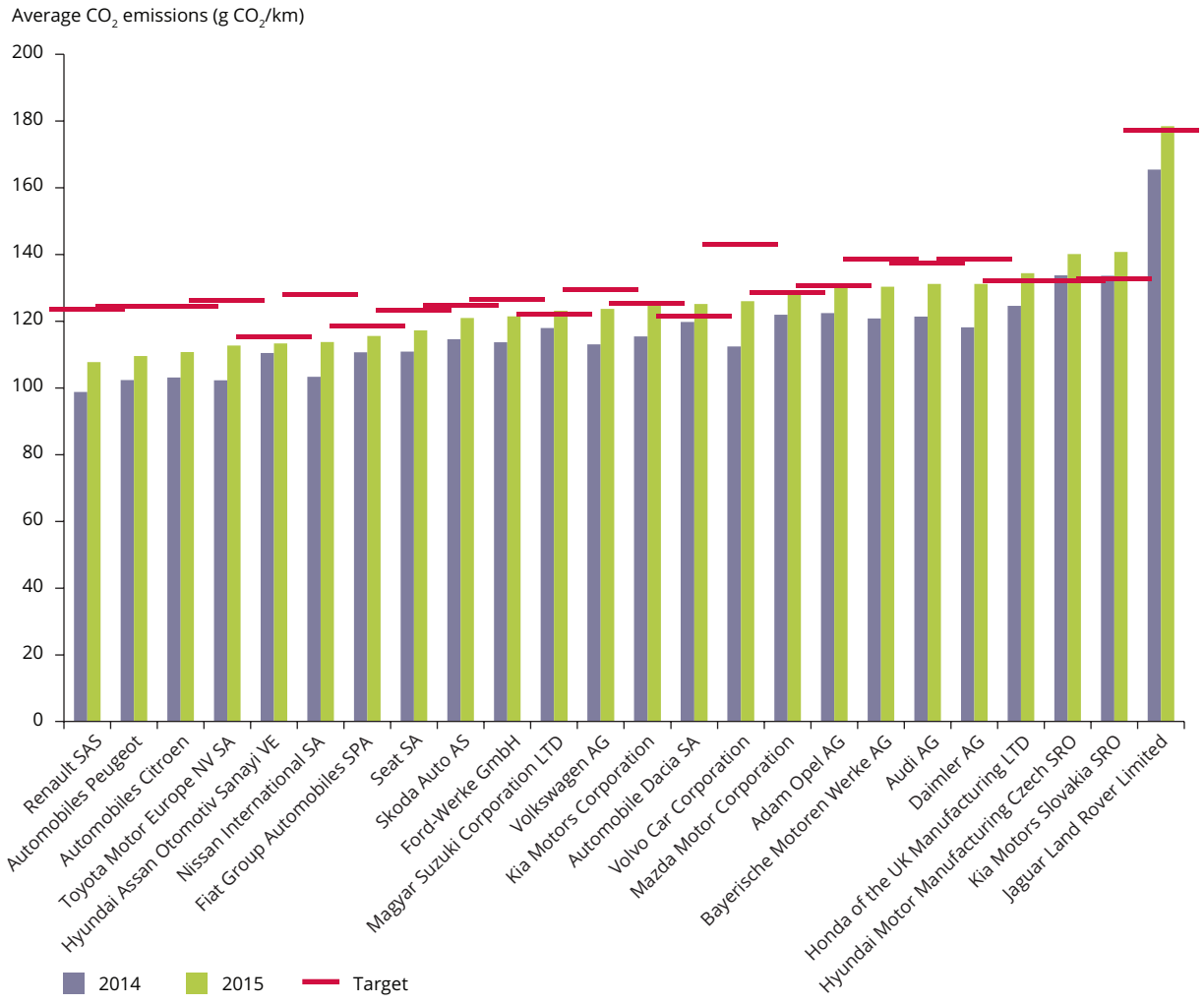
Manufacturers' performances are calculated on the basis of the adjustments summarised in Chapter 2. For 2015, the calculation will include 100% of the vehicle fleet, compared with 80% in 2014, and manufacturers receive super-credits of 1.5 cars for vehicles emitting less than 50 g CO_2/km (compared with 2.5 in 2014). From 2016, no super-credits will be taken into account until 2020. Manufacturers have one more year to further reduce CO_2 emissions and ensure compliance with their targets in 2015. In general, if the large manufacturers continue to reduce emissions as in past years, they will meet the 2015 targets.

In 2014, among the 24 large manufacturers, 18 manufacturers already complied with their 2015 targets. In comparison, the 2014 specific CO_2 emissions are also shown.

All manufacturers appear to be on track to reach their 2015 target. In order to be compliant with the 2015 targets, in 2014 three manufacturers still had to reduce the average emissions of their fleets by less than 1.5 g CO_2/km over the following year. Only two manufacturers had to reduce the average emissions by more than 6 g CO_2/km over the same period.

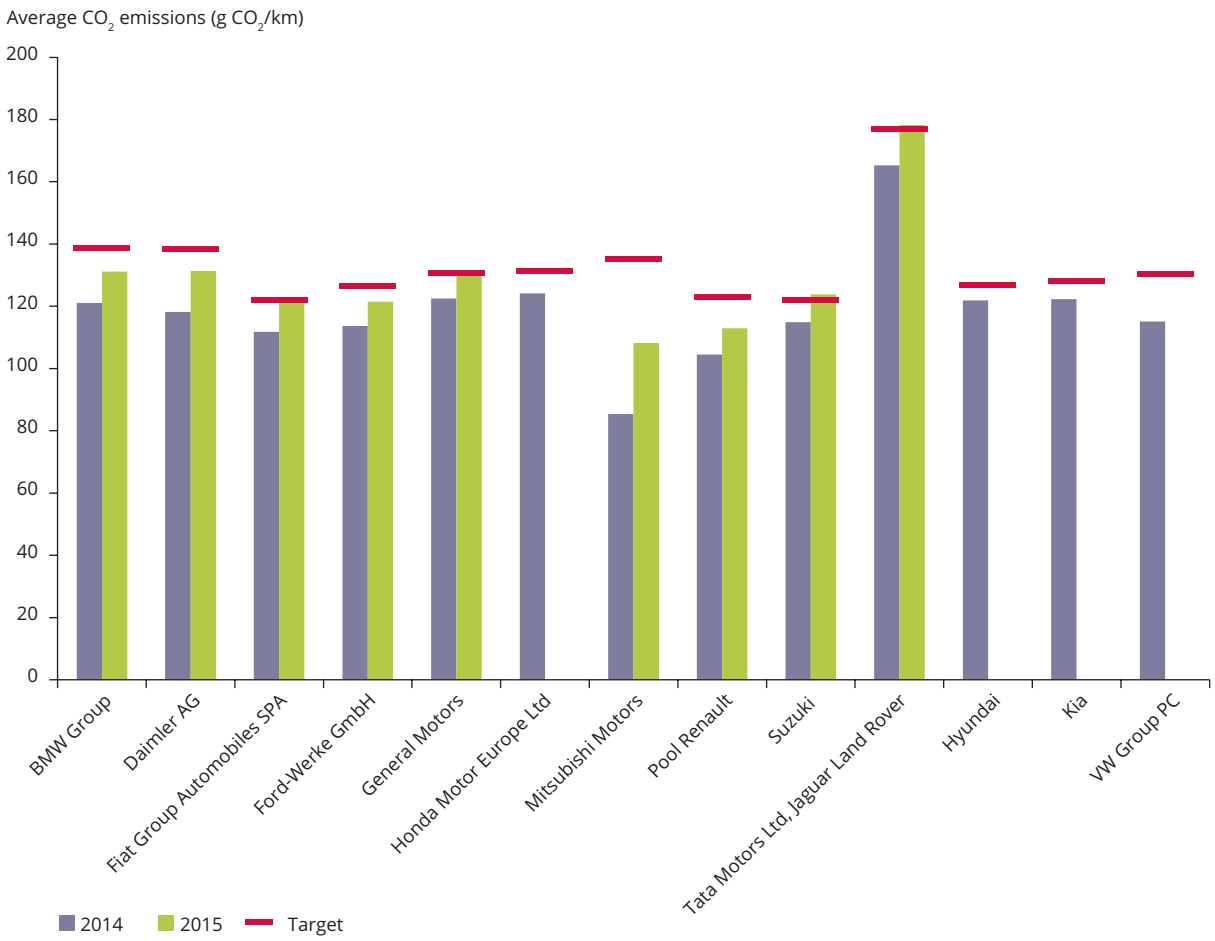
Looking at existing pools, only two pools needed to further improve their performance in order to be compliant with the 2015 targets. It should be noted that further pooling agreements between manufacturers may change and, in turn, influence these estimates.

Figure 3.12 Large manufacturers' performances, 2014–2015



Note: The target is calculated on the basis of 2014 vehicle mass data.

Figure 3.13 Pool performances, 2014–2015



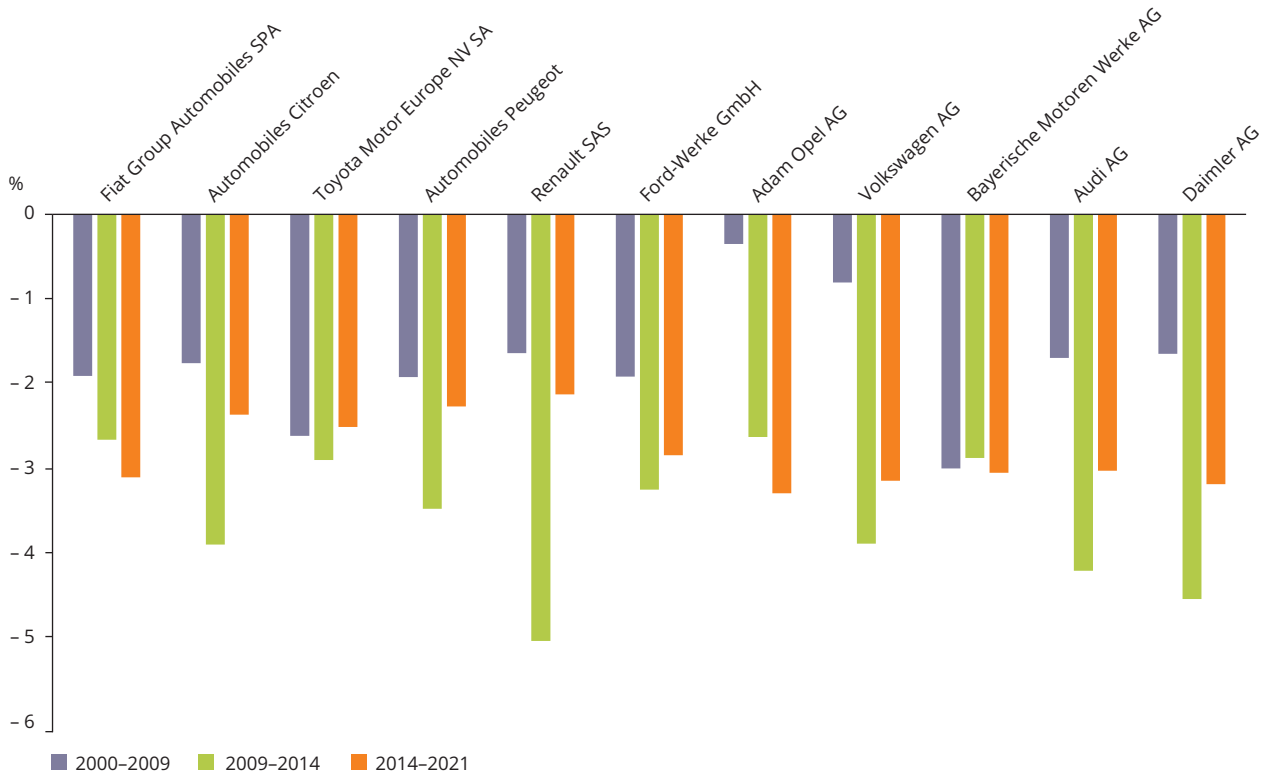
Note: Targets are calculated on the basis of 2014 data. Honda Motor Europe LTD, Hyundai, Kia and VW group pools PC are valid for 2014 only.

Regulation No 333/2014 defines the modalities for reaching the 2020 target. Taking these into account, it is also possible to make an estimate of the emission reduction that manufacturers would have to achieve in order to reach their targets in 2020, i.e. assessing the 'distance to target'.

Figure 3.14 presents the progress of the largest manufacturers (registering more than 500 000 vehicles a year) in terms of annual percentage changes for two periods: 2000–2009 and 2009–2014. These rates are compared with the expected reductions for respecting the 2021 target set by the regulation.

For these manufacturers, the rate of progress required from now until 2021 is in general lower than or comparable to the rate that has been achieved in the four years since the regulation (EU) No 443/2009 came into force. There are only three manufacturers for which the progress rates in the period 2013–2021 need to be greater than in the previous years. Figure 3.14 also shows that the greatest improvements were achieved over the period 2009–2014.

Figure 3.14 Comparison of past and future progress (only manufacturers registering > 500 000 vehicles in Europe) needed to meet the 2021 target



3.10 Excess emissions premiums

If a manufacturer's or a pool's average specific CO_2 emissions exceed the specific average target, Regulation (EC) No 443/2009 requires the payment of an excess emissions premium. The excess emissions premium for failing to meet the specific CO_2 emission target is calculated by multiplying the following three elements:

- the distance to the emission target in a given year (in g CO_2/km), i.e. the excess emissions;
- the number of vehicles registered by the manufacturer during that year;
- the premium level included in Table 3.9.

The premium amounts to EUR 5 for the first gram of CO_2/km exceeding the target, EUR 15 for the second gram of CO_2/km, EUR 25 for the third gram of CO_2/km and EUR 95 for each subsequent gram of CO_2/km. A greater distance to the target therefore implies a higher excess premium per gram of CO_2/km emitted.

For example, if a manufacturer registers 100 000 vehicles in the EU, the formula to be used for calculating the excess emissions premium varies depending on the distance to the target, as follows:

- if the distance to the target is 0.5 g CO_2/km, the first formula in Table 3.9 applies and the excess emissions premium = 0.5 * 5 * 100 000 = EUR 250 000;
- if the distance to the target is 1.5 g CO_2/km, the second formula in Table 3.9 applies and the excess emissions premium = (1 * 5 + (1.5 – 1) * 15) * 100 000 = EUR 1 250 000;
- if the distance to the target is 2.5 g CO_2/km, the third formula in Table 3.9 applies and the excess emissions premium = (1 * 5 + 1 * 15 + (2.5 – 2) * 25) * 100 000 = EUR 3 250 000;
- if the distance to the target is 3.5 g CO_2/km, the fourth formula in Table 3.9 applies and the excess emissions premium = (1 * 5 + 1 * 15 + 1 * 25 + (3.5 – 3) * 95) *100 000 = EUR 9 250 000.

For 2014, only one manufacturer (Aston Martin Lagonda Ltd) may be required to pay the excess emissions premium (see Annex 2).

Table 3.9 Coefficients to be used in the formula for calculating excess emissions premium

Excess emissions (g CO_2/km)	Fine (EUR)				Number of vehicles	Formula for calculating excess emission premium (EUR)
	5	15	25	95		
0–1	(EE)	-	-	-	NV	((EE) * 5)*NV
1–2	1	(EE – 1)	-	-	NV	(1*5 + (EE-1)*15)*NV
2–3	1	1	(EE – 2)	-	NV	(1*5 + 1*15 + (EE-2)*25)*NV
>3	1	1	1	(EE – 3)	NV	(1*5 + 1*15 + 1*25 + (EE-3)*95)*NV

Note: 'EE' is the distance to the target or excess emissions; 'NV' is the number of vehicles registered.

4 Light commercial vehicles (vans)

4.1 Number of new registrations

In 2014, there were 1.46 million new light commercial vehicle registrations in the EU-28 (around 10% of the total light-duty vehicles). This includes 7 342 IVAs ([24]), 15 576 vehicles approved under NSS rules ([25]), around 3 900 unknown ([26]) vehicles and 39 unidentified ([27]) vehicles.

It should be noted that there are uncertainties in both the 2012 and 2013 data sets, mainly owing to the difficulty experienced by Member States in the monitoring of multi-stage vans. The new monitoring system, based on VINs, in place from 2015 with effect for the 2014 data collection decreases these uncertainties.

For almost all Member States, the number of registrations increased in 2014 compared with 2013. The only Member States for which a decrease was observed were Malta and the Netherlands. The biggest increases in new vehicle registrations were observed in Poland (78%), Ireland (55%), Greece and Denmark (51%), whereas the decreases observed were quite small: the Netherlands (5%) and Malta (2%).

The largest markets in Europe with regard to the new registrations of vans in 2014 were France (with a share of 24%), the United Kingdom (22%) and Germany (15%) (Figure 4.1). The EU-15 still accounted for the vast majority of registrations of new light commercial vehicles in the EU, with a share of 91% of the total registrations. Compared with 2013, the number of vehicles registered in the EU-13 increased by 41%, while the number of newly registered vehicles in the EU-15 increased by 15%.

The average CO_2 emission from the new light commercial vehicle fleet in the EU-28 in 2014 was 169.1 g CO_2/km. The average emissions of CO_2 in 2014 have decreased by 4.2 g CO_2/km compared with the previous year (173.3 g CO_2/km in 2013).

In 2014, the average new light commercial vehicle in the EU-15 emitted 4.1 g CO_2/km less than the average newly registered vehicle in 2013 (Table 4.1), whereas, in the EU-13 ([28]), it emitted 6.2 g CO_2/km less.

The percentage of newly registered vehicles with emissions lower than 140 g CO_2/km increased in 2014 compared with 2013 and almost 36% of newly registered vehicles emitted less than 140 g CO_2/km, compared with 32% in 2013. The number of vehicles emitting less than 180 g CO_2/km represented 50% of the registrations in 2014 (48% in 2013).

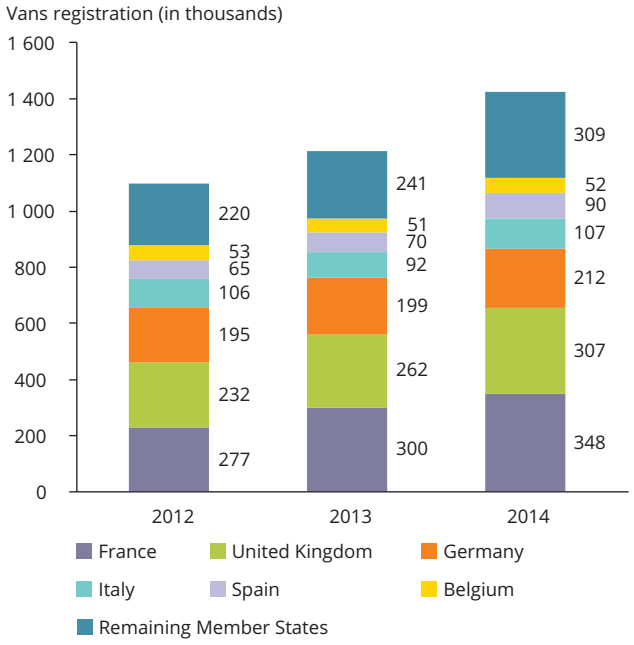
Table 4.1 Average CO_2 emissions (g CO_2/km) from light commercial vehicles by region

	2012	2013	2014
EU-28	180.2	173.3	169.0
EU-15	180.0	172.9	168.8
EU-13	182.5	178.5	172.2

Note: Croatia provided data for 2014, whereas, for 2012 and 2013, data for Croatia are not included in the calculations.

([24]) IVAs are applicable to vehicles imported from third countries or to own-build vehicles that have to be individually approved.
([25]) NSS vehicles are vehicles that are approved nationally in very small numbers.
([26]) Unknown vehicles are vehicles for which the manufacturer's name is missing in the database for unknown reasons. Those vehicles cannot be attributed to a manufacturer and are therefore not included in the provisional calculation of targets.
([27]) Unidentified vehicles are vehicles for which the mass in running order or the CO_2 emissions are missing in the database for unknown reasons. Unidentified vehicles were not considered for the calculation of the average specific emissions or the specific emissions targets for manufacturers.
([28]) The geographical coverage change in 2014 since Croatia was added to the EU-12 group.

Figure 4.1 **Number of light commercial vehicles registered in the EU-28 between 2012 and 2014**



Note: The remaining Member States are the EU-13, Austria, Denmark, Finland, Ireland, Greece, Luxembourg, the Netherlands, Portugal and Sweden.

In 2012, France did not provide information on their entire fleet of vans, owing to an update of the registrations system.

4.2 EU statistics

Diesel vehicles accounted for more than 96.8% of the total new registrations in 2014. The average CO_2 emissions of diesel and petrol vehicles decreased by 4.7 g CO_2/km and 3.9 g CO_2/km, respectively, compared with 2013 (Table 4.2 and Figure 4.2). In 2014, the average diesel vehicle emitted 170.5 g CO_2/km, about 21.5 g CO_2/km more than the average petrol vehicle (in 2013, the difference between diesel and petrol vehicles was 22.2 g CO_2/km). It should be noted that this difference in the average CO_2 emissions between diesel and petrol vehicles is due to the difference in their average masses. Diesel vehicles are generally bigger, and hence heavier (1 777 kg on average), than petrol vehicles (1 269 kg on average).

There were about 6 700 newly registered electric vehicles compared with 6 000 registered in 2013 (Table 4.3). Of the other types of AFVs, LPG and NG were the most sold vehicles (around 2 300 and 8 200 vehicles registered, respectively).

Table 4.2 **Average CO_2 emissions (g CO_2/km) from light commercial vehicles by fuel (EU-28)**

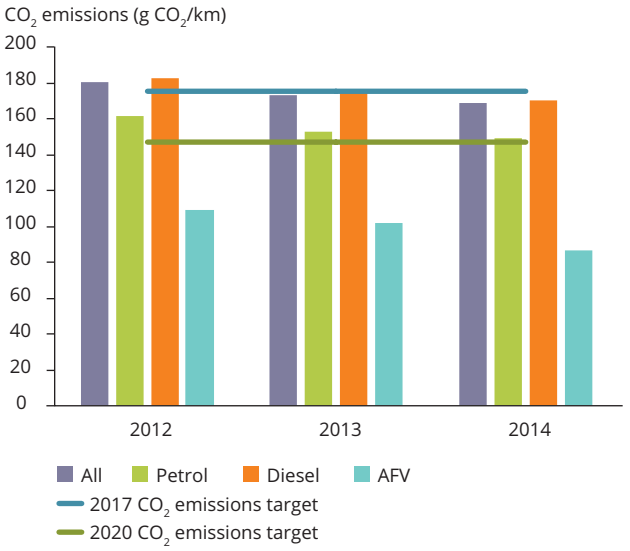
	2012	2013	2014
All fuels	180.2	173.3	169.1
Petrol	161.3	153.0	149.0
Diesel	182.7	175.2	170.5
AFV ([a])	109.4	101.8	86.8

Note: ([a]) For the calculation of the average CO_2 emissions of AFVs, pure electric, LPG, NG, E85, biodiesel and plug-in vehicles (diesel-electric or petrol-electric) are included.

Table 4.3 **Share (%) of fuel type in light commercial vehicles (EU-28 ([29]))**

	2012	2013	2014
Diesel	96.5	96.5	96.8
Petrol	1.8	2.0	2.0
AFV	1.7	1.5	1.2

Figure 4.2 **Evolution of CO_2 emissions from light commercial vehicles by fuel type in the EU-28**

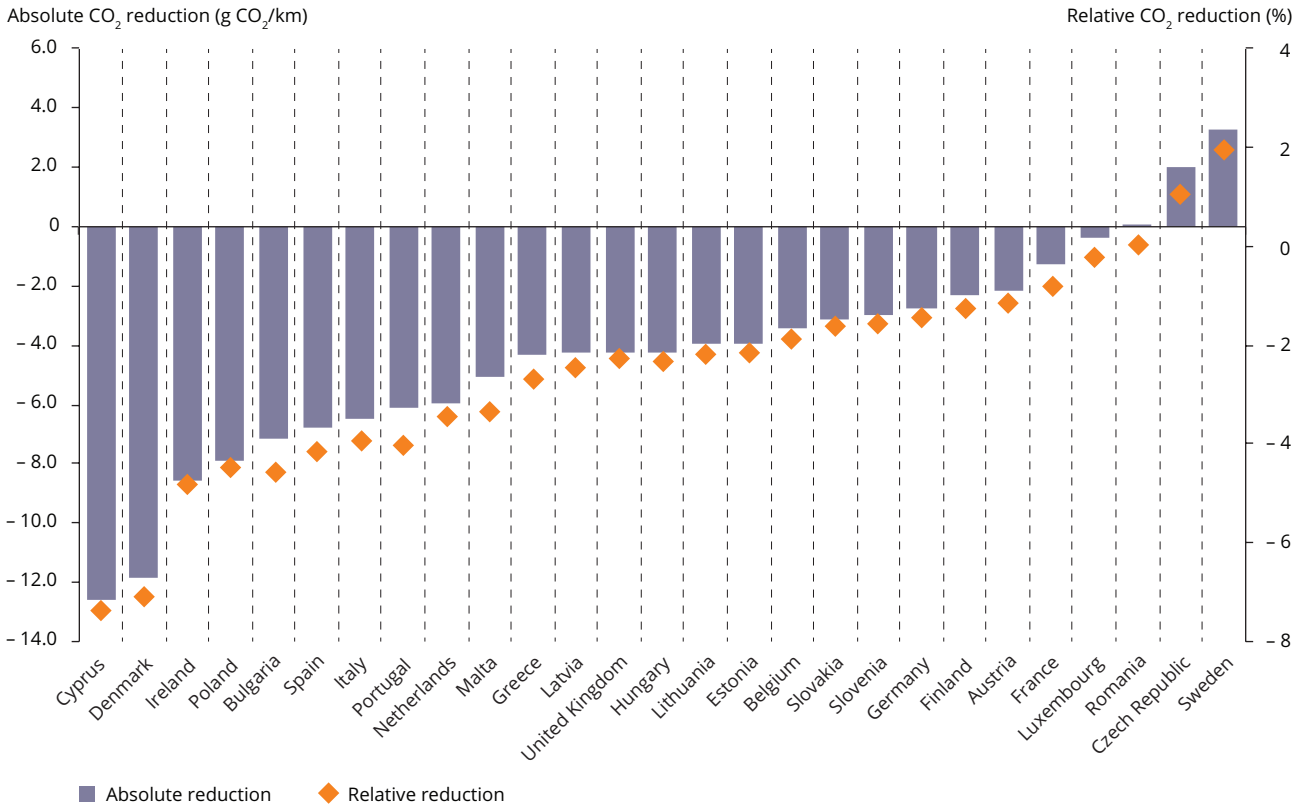


([29]) The geographical scope of the data changes over time from EU-27 to EU-28 (see Annex 1 for details).

4.3 Comparison between Member States

With the exception of the Czech Republic and Sweden, for which the average CO_2 emissions in 2014 increased compared with 2013, in all countries, CO_2 emissions from light commercial vehicles fell in 2014 (Figure 4.3). For Romania the emissions remained almost constant in 2014 compared with 2013. Sixteen Member States had average CO_2 emissions from newly registered vehicles already below the 175 g CO_2/km EU target set for 2015 ([30]) (Figure 4.4). Ten of these had emission values below 160 g CO_2/km. For some of these Member States (Bulgaria, Malta and Portugal), the low average emissions are mainly related to the registration of relatively small vehicles: the average mass of the new fleet of these countries was below 1 600 kg. Malta, Portugal and Croatia have vans with the lowest average engine capacities in Europe. Spain has the lowest average engine power value, followed by Lithuania, Ireland, Portugal and France (but note that only 26 EU Member States reported engine power information).

Figure 4.3 Absolute and relative reduction (%) in emissions by Member State between 2014 and 2013

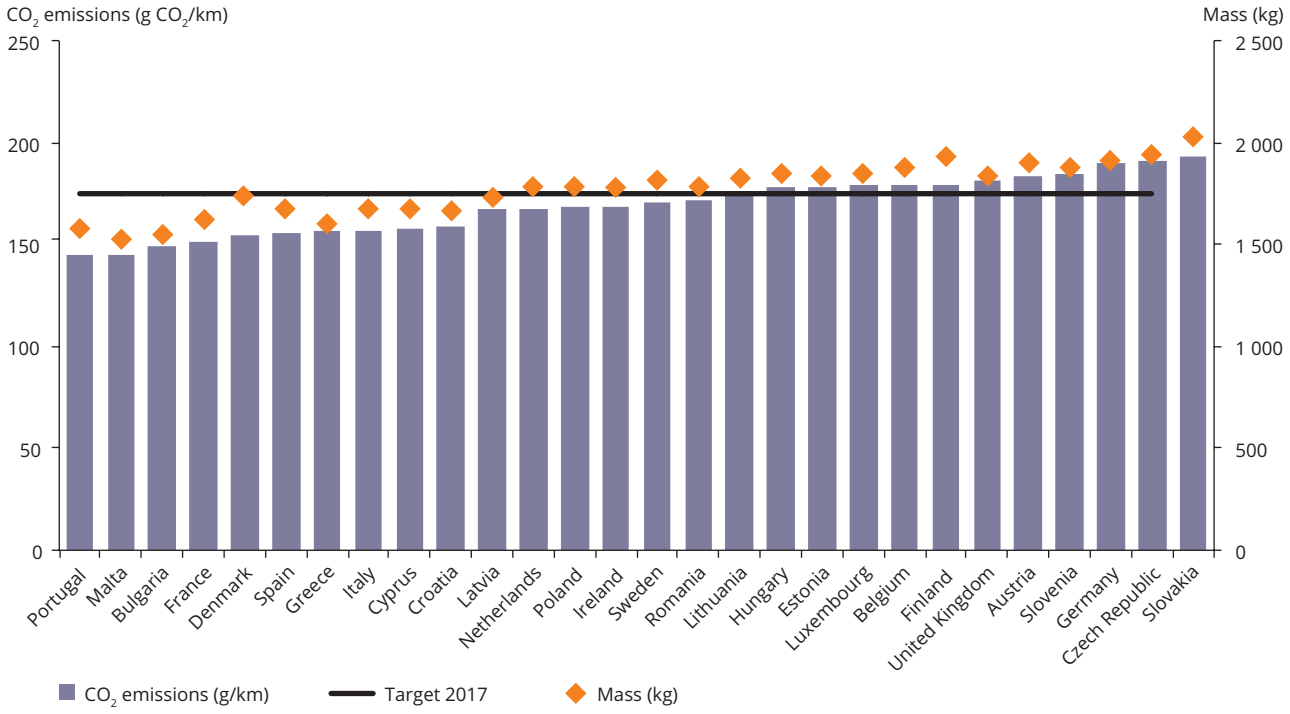


([30]) According to Regulation (EU) No 510/2011, the new vans registered in the EU as a whole do not have to emit more than an average of 175 g CO_2/km by 2017.

For light commercial vehicles, the share of diesel vehicles is very high. For the majority of Member States (exceptions are Bulgaria, Cyprus and Poland), the share of diesel vehicles is above 90%.

Owing to their market size, the Member States with higher numbers of vehicle registrations — Germany, Spain, France, Italy and the United Kingdom — are the major contributors to the total reductions in the EU-28 CO_2 emissions from light commercial vehicles. Of these five countries, France, Italy and Spain have the lowest average CO_2 emissions. For Italy, this is the result of a combination of reasons. Italy, like Malta and Portugal, has one of the lowest average engine capacity values (1 767 cm^3: the fifth lowest among the EU Member States). In addition to this, Italy has registered the most AFVs among EU-28 (7% of the total new registrations of Italy). Italy's AFVs are mainly NG vehicles (77% of all AFV registrations) with an average CO_2 value of 135 g CO_2/km and LPG vehicles (20% of all AFV registrations) with an average CO_2 value of 135 g CO_2/km. France has a relatively high share of pure electric vans (1% of all vehicles registered in France) with zero emissions.

Figure 4.4 Average CO_2 emissions and average mass by EU Member State in 2014



Note: The 2017 target is the target for the average fleet of new vans in the EU as a whole.

4.4 CO_2 emissions from van manufacturers in 2014

Table 4.4 presents data (number of registrations, average mass and average emissions) for large van manufacturers that registered more than 10 000 vehicles in 2014 ([31]). In total, they account for 96.2% of the vans fleet. Average emissions of 2012 and 2013 of those manufacturers are also presented in the same table.

In 2014, the most popular brand was Renault, with 15% of the vans registered in the EU-28. Ford-Werke GmbH and Volkswagen AG followed, with the 14% of the fleet.

Six manufacturers, representing almost 52% of the European new vans fleet, had average emissions lower than 175 g CO_2/km: Automobile Dacia SA, Automobiles Peugeot, Automobiles Citroen, Renault, Fiat Group Automobiles Spa and Adam Opel AG. These are the manufacturers with the lower average masses in the group. The average emissions for the large manufacturers are in the range of 132–267 g CO_2/km. Average mass values are in the range of 1 283–2 454 kg.

Automobile Dacia SA, like in 2013, achieved the lowest average CO_2 emissions (132 g CO_2/km) and the lowest average mass (1 283 kg).

Automobiles Peugeot is one of the large manufacturers that lowered its emissions considerably compared with 2013 (about 5%). The average mass decreased by almost 4%.

All manufacturers in this group, with the exception of Toyota Motor Europe NV SA, Ford Motor Company of Australia Limited and Iveco Spa, decreased their average emission levels in 2014 compared with 2013. Fiat Group Automobiles Spa, Automobile Dacia SA and Volkswagen AG kept their average emission levels constant. The largest reductions in average emissions were achieved by Ford-Werke GmbH (13.3 g CO_2/km), Jaguar Land Rover Limited (9.2 g CO_2/km) and Nissan International SA (7.5 g CO_2/km).

Table 4.4 Main specific emission statistics for the vans manufacturers registering more than > 10 000 vehicles a year (ordered by average emissions in 2014)

Manufacturer	Registrations 2014	Average mass (kg) 2014	Average CO_2 (g CO_2/km)		
			2014	2013	2012
Automobile Dacia SA	21 978	1 283	132	132	145
Automobiles Peugeot	154 909	1 549	147	154	159
Automobiles Citroen	155 250	1 552	148	153	158
Renault SAS	204 851	1 615	149	152	171
Fiat Group Automobiles SPA	124 827	1 677	158	157	157
Adam Opel AG	77 361	1 729	173	178	178
Ford-Werke GmbH	179 004	1 859	175	189	188
Volkswagen AG	185 944	1 819	180	180	185
Nissan International SA	39 544	1 888	184	192	199
Toyota Motor Europe NV SA	28 097	1 926	193	191	202
Daimler AG	126 054	2 163	200	205	219
Isuzu Motors Limited	10 864	2 051	200	203	212
Iveco SPA	31 895	2 454	228	224	230
Ford Motor Company of Australia Limited	12 338	2 184	228	227	228
Jaguar Land Rover Limited	14 534	2 031	267	276	

Note: In 2012, Jaguar and Land Rover appeared as two independent manufacturers.

([31]) It should be noted that Regulation (EU) No 510/2011 provides manufacturers registering fewer than 22 000 new vehicles in a calendar year with the possibility of applying for a derogation target.

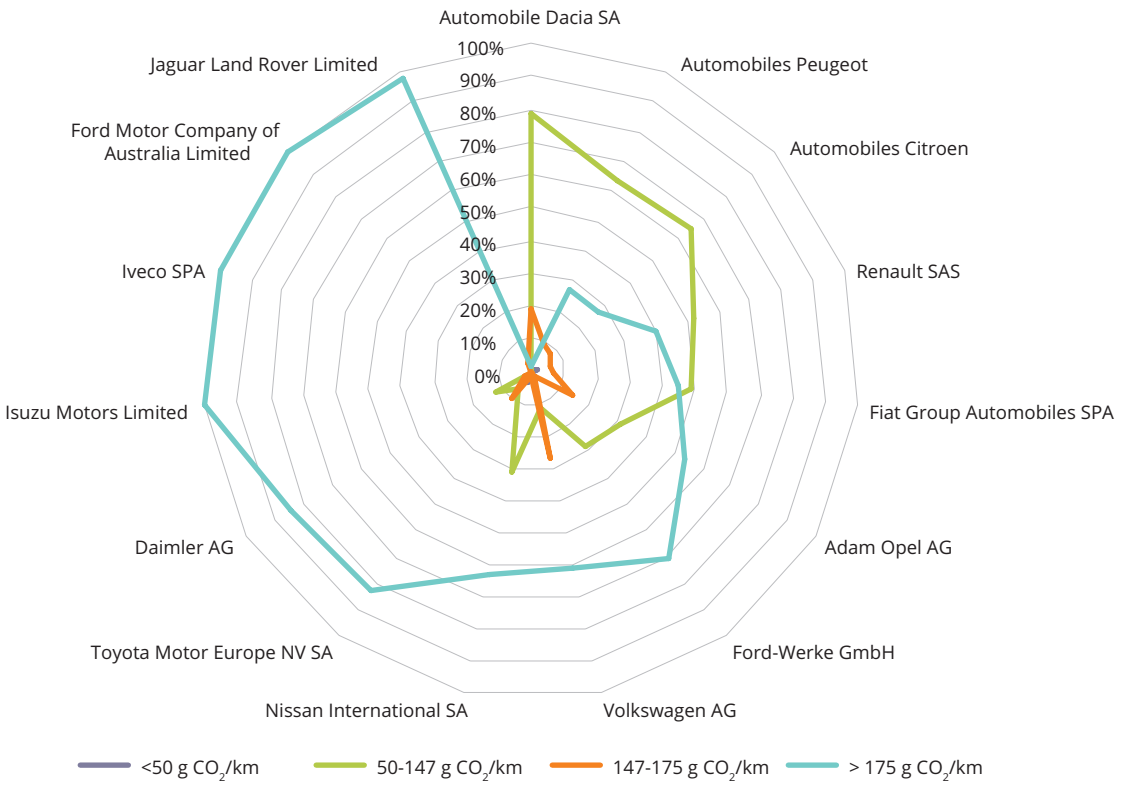
The distribution of registrations over different emissions classes (Figure 4.5) shows that the fleet composition is very different among manufacturers. The low-emitting vehicles (below 50 g CO_2/km) represent a very small percentage for the large majority of the manufacturers: for only Renault and Nissan is the contribution of these vehicles around 2–4%. For four manufacturers (Automobile Dacia SA, Automobiles Peugeot, Automobiles Citroen and Renault SAS), the percentage of vehicles emitting less than 147 g CO_2/km is higher than 50%. For all of the other manufacturers, the contribution of the vehicles emitting more than 175 g CO_2/km represents the higher contribution to the fleet.

4.5 Distance to the 2014 target

The distance of the manufacturers to their specific emissions targets is calculated by taking into account the adjustments listed in Chapter 2 (i.e. phase-in, super-credits, E85 extra credits and eco-innovations).

Based on their average CO_2 emissions in 2014, all of the 15 larger manufacturers, representing about 96.2% of the total registrations in the EU, achieved their specific emissions targets for 2014.

Figure 4.5 Percentage of registrations over different emissions classes



The remaining manufacturers had applied for a pool in 2014, or fell within the scope of the de minimis threshold, according to which manufacturers with fewer than 1 000 registrations are exempt from achieving a specific emissions target. In total, there were 13 manufacturers with fewer than 2 300 vehicles registered in 2014 that benefitted from the de minimis exemption. The data are available in Annex 2.

Figure 4.6 graphically illustrates the distance to target for the fifteen manufacturers with more than 10 000 new registered vehicles in 2014. For the year 2014 Jaguar Land Rover was granted a derogation target which was met.

The distance to target for the eight pools of manufacturers is presented in Table 4.5. In 2014, all the pool of manufactures achieved their specific emissions target. A derogation has been granted for Mitsubishi Motors.

4.6 Excess emissions premiums

Like Regulation (EC) No 433/2009, if a manufacturer's or a pool's average specific CO_2 emissions exceed the specific average target, Regulation (EU) No 510/2011 requires the payment of an excess emissions premium. The formulae for calculating excess emissions premiums for failing to meet the specific CO_2 emission target are equivalent to the ones used for passenger cars (see Section 3.10).

The first year in which the target is binding for vans is 2015. No manufacturers exceeded their targets in 2014.

Figure 4.6 Distance to 2014 target by individual manufacturers (only manufacturers registering > 10 000 vehicles in Europe)

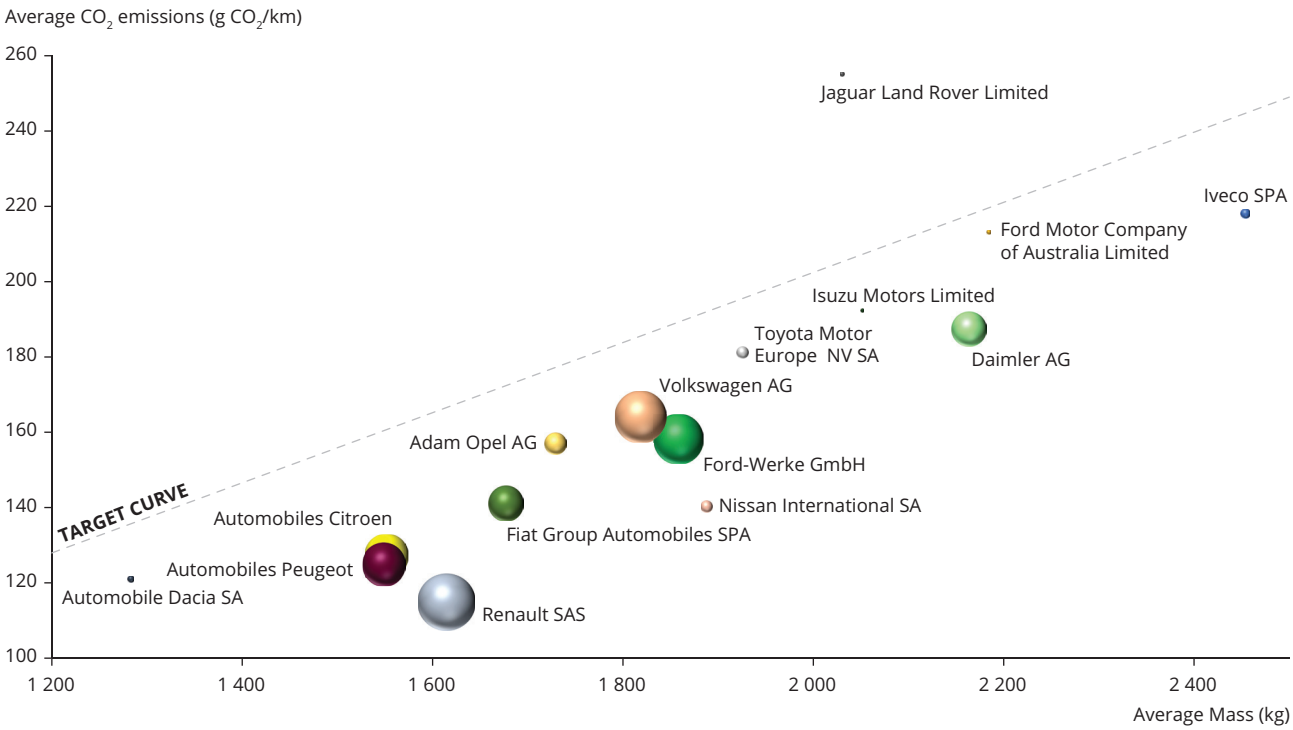


Table 4.5 Distance to target for the pools in 2014

Pool	Manufacturer	Average emissions (g CO_2/km)	Target (g CO_2/km)	Distance to target (g CO_2/km)
	Daimler AG	187	218	– 30
	Mitsubishi Fuso Truck & Bus Corporation	236	245	– 10
	Mitsubishi Fuso Truck Europe SA	236	242	– 6.0
	M.F.T.B.C.	238	221	17
Daimler		188	218	– 30
	Chrysler Group LLC	201	211	– 10
	Fiat Group Automobiles SPA	141	172	– 31
Fiat Group Automobiles Spa		142	173	– 31
	CNG-Technik GmbH	117	152	– 35
	Ford Motor Company of Australia Limited	213	219	– 6.0
	Ford Motor Company	217	221	– 3.0
	Ford-Werke GmbH	158	189	– 31
Ford-Werke GmbH		161	191	– 30
	Adam Opel AG	157	177	– 20
	GM Korea Company	142	172	– 29
General Motors		157	177	– 20
	Kia Motors Corporation	121	145	– 24
	Kia Motors Slovakia SRO	116	152	– 36
Kia		120	147	– 27
	Mitsubishi Motors Corporation MMC	192	210	– 18
	Mitsubishi Motors Europe BV MME	204	210	– 6.0
	Mitsubishi Motors Thailand Co Ltd MMTH	203	210	– 7.0
Mitsubishi Motors		201	210	– 9.0
	Automobile Dacia SA	121	136	– 15
	Avtovaz JSC	210	137	73
	Lada France	179	141	38
	Renault SAS	115	166	– 52
Pool Renault		114	163	– 50
	Audi AG	137	175	– 38
	Dr Ing HCF Porsche AG	191	219	– 28
	Quattro GmbH	232	198	34
	Seat SA	99	128	– 29
	Skoda Auto AS	115	137	– 22
	Volkswagen AG	164	185	– 21
Volkswagen Group LCV		159	183	– 23

5 Vehicle taxation systems in Europe

As described in Chapter 3, in all EU Member States, the CO_2 emissions from newly registered passenger cars have significantly fallen since the entry into force of Regulation (EC) No 443/2009. Substantial differences in performances and improvements over the years are observed amongst Member States.

One way that Member States can influence the uptake of efficient vehicles is through their national taxation systems, including vehicle registration tax, circulation tax and fuel tax. Over the last years, because of their generally lower contribution to CO_2 emissions, many European governments have chosen to provide financial incentives, which have directly or indirectly encouraged the uptake of diesel engines. More recently, incentives that promote the uptake of electric vehicles have also become more common across a number of Member States. According to the analysis performed for the European Commission, there is no conclusive evidence that the CO_2 regulations themselves are primarily responsible for the increased uptake of diesel vehicles in Europe. Other factors, such as national vehicle registration taxes and consumer preferences appear to be more important factors (DG CLIMA, EC, 2015a).

The uptake of diesel vehicles, which has been encouraged by financial incentives in many Member States, has not, however, necessarily been positive in terms of the subsequent impacts on air pollution. Diesel vehicles emit higher levels per kilometre of fine particulate matter and nitrogen oxides — both important pollutants in terms of the harm they cause to health — than their petrol equivalents. Furthermore, there has recently been significant public attention focused on the widely publicised findings that nitrogen oxide emissions from diesel vehicles can be, on average, as much as four or five times higher under real driving conditions than the emissions measured during the formal vehicle 'test-cycle' measurements.

Apart from the United Kingdom, which applies the same tax rate per litre for diesel and petrol, all other Member States presently tax diesel less then petrol (EC, 2015b). The largest differences are found in Greece (where diesel is taxed approximately 50% less than petrol) and in Belgium, Denmark, the Netherlands and Portugal (where diesel taxes are about 30 to 35% lower). Therefore, many European countries encourage the use of diesel vehicles over their petrol equivalents and the percentage of diesel vehicles registered has thus increased in the majority of the Member States since 2010. Taxing road transport fuels according to their energy content and CO_2 emissions may, for example, better reflect the environmental (greenhouse gas) impact of different fuels. This would result in higher taxes for diesel on a per litre basis, reflecting the fact that a litre of diesel contains more energy and more carbon than a litre of petrol.

A comparison between Member States, based on the ranking of their average car CO_2 emissions, in 2010 and 2014 is shown in Figure 5.1. If a Member State lies on the 1:1 line, it means that their rank has not changed; if a Member State is above the line, it means that its performance has improved since 2010, while, if it is below the line, its relative performance has decreased since 2010.

Figure 5.1 shows that the 10 best performing countries in 2014 were also the 10 best performing ones in 2010. In contrast, the three most poorly performing countries in 2014 (Bulgaria, Estonia and Latvia) were also the three most poorly performing countries in 2010. It is noted that the majority of the countries having relatively poorer rankings (Bulgaria, Czech Republic, Estonia, Lithuania, Hungary, Poland and Slovakia) did not apply any incentives for improving fuel efficiencies in their taxation systems in either 2010 or 2014 (Table 5.1).

Several Member States, such as Denmark, Greece, the Netherlands and Portugal, have introduced or are still using differentiated taxes to discourage the purchase of cars with high CO_2 emissions, i.e. the more CO_2 the vehicle emits the higher the taxes to be paid (registration and/or annual taxes). Each of these systems generally features a minimum threshold, under which no taxes need be paid. There are, however, a number of differences between the countries employing such systems; for example, minimum thresholds can be different (e.g. 120 g CO_2/km in Spain compared with 85 g CO_2/km in the Netherlands) or the ways in which the tax is applied can vary (e.g. same or different differentiations for diesel and petrol vehicles).

In some countries, a bonus–malus system is applied for the registration tax. This means that cars are taxed (malus) or credited (bonus) if their carbon emissions are above or below certain thresholds. In France, for example, the environmental tax is applied as a malus to all vehicles emitting 131 g CO_2/km or more, while a bonus is granted for new cars emitting 60 g CO_2/km or less (the maximum bonus is EUR 6 300 for vehicle emitting 20 g CO_2/km or less) (Ministère de l'Écologie, du Développement Durable et de l'Énergie 2015).

In some other countries, certain vehicle technologies have been banned entirely in the past. In Greece, for example, the proportion of diesel vehicles in the total fleet is presently very low, with the diesel car share just 4.1% in 2013, the lowest in the EU. Diesel engines were banned from central Athens and Thessaloniki, where 70% of the Greek population lived in 1991, and the ban was only lifted in 2012. The uptake of diesel vehicles is therefore expected to increase in Greece in the coming years: in 2014, 64% of the vehicles sold in Greece were diesel, while in 2012 only 10% of the new fleet was diesel.

Figure 5.1 Comparison of Member States' 2010 and 2014 rankings of average car CO_2 emissions

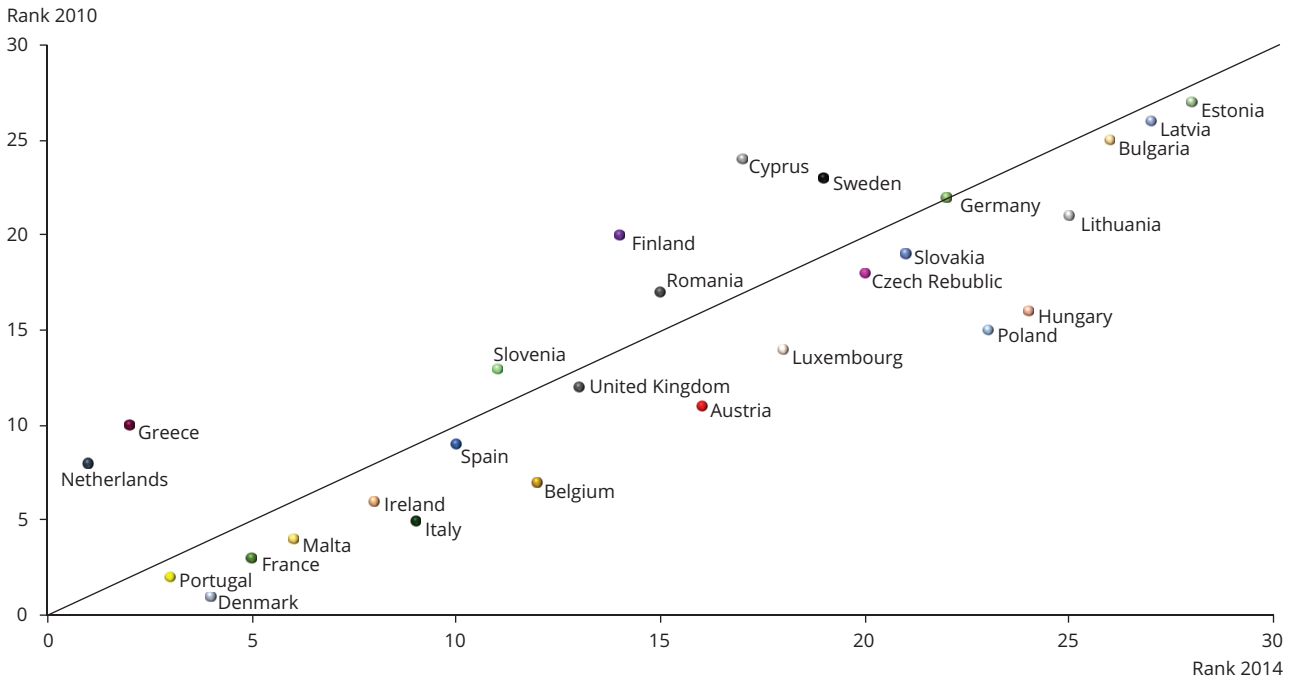


Table 5.1 Summary of car registration and annual tax in EU-28

	Registration tax	Annual tax	Incentives for EV (Electric Vehicles)
Austria	Based on CO_2 emissions +/– bonus-malus system.	Based on engine power.	EV have deductions form the registration tax and are exempted from circulation taxes (based on engine power).
Belgium	Partly based on CO_2 and air pollutants emissions in Flanders. Malus system for car emitting more than 145 g CO_2/km in the Wallon region.	Based on engine capacity.	
Bulgaria	None.	Based on engine power.	
Croatia	Based on CO_2 emissions — similar CO_2 graduation for diesel (86 g CO_2/km threshold) and petrol vehicles (91 g CO_2/km threshold).	Based on engine power.	
Cyprus	Based on CO_2 emissions. Same CO_2 graduation for diesel and petrol vehicles (120 g CO_2/km threshold).	Based on CO_2 emissions.	
Czech Republic	None.	None.	
Denmark	Based on the price of the vehicles and on fuel consumption. Different graduation for diesel (17 km/l threshold) and petrol vehicles (16 km/l threshold).	Strongly based on fuel consumption. Different graduation for diesel (32.1 km/l threshold) and petrol vehicles (20 km/l threshold).	EVs and BEVs weighing less than 2000 kg are exempted from registration and annual circulation taxes.
Estonia	None.	None.	
Finland	Partly based on CO_2 emissions. Same graduation for diesel and petrol vehicles.	Partly based on CO_2 emissions. Differences for diesel and petrol vehicles.	
France	Based on CO_2 emissions with a bonus-malus system favouring the low emitting cars. Same graduation for diesel and petrol vehicles (130 g CO_2/km threshold).	Only for vehicle emitting more than 190 g CO_2/km.	Because of the bonus-malus system EVs and some PHEVs are credited.
Germany	None.	Partly based on CO_2 emissions (linear regression). Same graduation for diesel and petrol vehicles (95 g CO_2/km threshold).	Circulation tax based on engine displacement and CO_2 emission. EVs are exempted for 10 years.
Greece	Based on the car price and vehicle category.	Based on CO_2 emissions. Not strongly graduated. Same thresholds for diesel and petrol (100 g CO_2/km).	
Hungary	Based on engine capacity and exhaust emissions.	Based on engine power.	
Ireland	Based on CO_2 emissions. Same thresholds for diesel and petrol vehicles (80 g CO_2/km).	Based on engine capacity and CO_2 emissions. Same thresholds for diesel and petrol.	
Italy	Based on horsepower and weight.	Based on horsepower. Partly based on CO_2 emissions (discount for vehicles emitting less than 120 g CO_2/km).	
Latvia	Based on CO_2 emissions. Same thresholds for diesel and petrol vehicles (120 g CO_2/km).	Based on weight.	
Lithuania	None.	None.	
Luxembourg	None.	Based on CO_2 emissions. Different graduation for petrol and diesel vehicles.	Incentives of 5 000 euros for electric and plug-in vehicles.
Malta	Based on CO_2 emissions price and vehicle lengh.	Based on vehicle age and CO_2 emissions.	
Netherlands	Based on price and CO_2 emissions. Different graduation for diesel (85 g CO_2/km threshold) and petrol vehicles (88 g CO_2/km threshold).	Based primarily on vehicle weight.	EVs and most plug-in vehicles are exempted from registration and annual taxes.
Poland	Based on cylinder capacity.	None.	
Portugal	Based on cylinder capacity and CO_2 emissions. Different graduation for diesel and petrol vehicles.	Partly based on CO_2 emissions. Same thresholds for diesel and petrol vehicles.	

Sources: ACEA, 2014; EC, 2014; ICCT, 2015.

Table 5.1 Summary of car registration and annual tax in EU-28 (cont.)

	Registration tax	Annual tax	Incentives for EV (Electric Vehicles)
Romania	Based on engine capacity, exhaust emissions and CO_2.	Based on cylinder capacity.	
Slovakia	Based on engine power.	None.	
Slovenia	Partly based on CO_2 emissions. Similar threshold for petrol and diesel vehicles.	Based on cylinder capacity.	
Spain	Based on CO_2 emissions. High threshold. Same thresholds for diesel and petrol vehicles (120 g CO_2/km threshold).	Based on horsepower.	
Sweden	None.	Partly based on CO_2 emissions. Different graduation for diesel and petrol vehicles. Same thresholds for diesel and petrol vehicles (117 g CO_2/km threshold).	EVs are exempted.
United Kingdom	None.	Based on engine capacity and CO_2 emissions. Same thresholds for diesel and petrol vehicles (100 g CO_2/km threshold).	EVs and some plug-in vehicles are exempted. Customer purchasing incentives are applicable for new electric vehicles.

Recently, a number of Member States have also started to provide incentives for electric vehicles, such as hybrid electric, battery electric and plug-in hybrid vehicles, to encourage their uptake. In addition, electricity charges are typically considerably lower than petrol and diesel, giving further incentives to consumers for electric driving.

The EEA's 2014 TERM report (EEA, 2014) highlights the growing market share of electric vehicles in the EU. However, pure electric vehicles currently constitute only a very small fraction of the total fleet (0.04%) and the latest data show that their share in the EU-28 new car registrations is 0.30%. The number of new electric vehicles sold in the EU-28 has increased from around 700 in 2010 to around 38 000 in 2014. France (more than 10 700 vehicles) and Germany (around 8 500 vehicles) are the countries for which the increase has been the greatest since 2010. Around 6 700 electric vehicles were registered in the United Kingdom. The number of plug-in hybrid vehicles is also increasing. Collectively, battery electric and plug-in hybrid vehicles accounted for 0.8% of the total new registrations in the EU-28. A large number of EU Member States (e.g. Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Romania, Spain, Sweden and the United Kingdom) already offer financial incentives such as tax reductions and exemptions for electrically chargeable vehicles. Such incentives include exemptions from one-off purchase tax (making the cost comparable with conventional vehicles), value-added tax (VAT) exemption and permitting the use of bus lanes.

A non-EU-28 case: Norway

Plug-in hybrids and battery electric cars accounted for 5.8% of all new car sales in Norway in 2013. In 2014, the market share further increased to 14.6% during the first half of the year. In total, there are estimated to be 21 000 electric cars in a country of five million people. In comparison, there are approximately 70 000 electric cars in the USA, which has a population of 313 million. This makes Norway the leading market for electric vehicles in terms of market share (ICCT, 2015). The government has achieved this through offering large incentives including exemption from high rates of purchase tax and VAT, exemption from road tolls, free ferry rides, the ability to drive in bus lanes, free parking and free charging from thousands of electricity points across the country. Local governments also subsidise the installation of charging points in homes (EV Norway, 2015). In 2012, there was cross-party support to keep the financial incentives for zero-emission vehicles until 2018 or until there are 50 000 zero-emission vehicles on the roads. At the beginning of 2015, electric car sales in Norway reached a cumulative total of 50 000 (2% of the Norwegian fleet) (ELBIL, 2015).

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Annex 1

Table A1.1 Registration of new passenger cars by Member State (in thousands)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	295	280	300	311	308	309	298	294	319	328	356	335	319	303
Belgium	497	468	459	485	480	526	525	536	475	551	577	490	490	485
Bulgaria							86	91	21	14	14	14	15	16
Croatia													28	35
Cyprus				20	18	20	25	24	16	15	15	11	7	8
Czech Republic				115	105	107	126	134	159	165	169	170	162	179
Denmark	97	113	102	124	147	154	160	148	111	151	170	171	184	188
Estonia				17	20	25	31	24	10	10	17	19	20	21
Finland	106	113	145	141	146	143	123	137	89	109	122	107	100	103
France	2 228	2 120	1 988	1 996	2 059	1 986	2 050	2 037	2 259	2 250	2 174	1 932	1 827	1 838
Germany	3 342	3 122	3 237	3 267	3 319	3 445	3 126	3 067	3 786	2 873	2 933	3 062	2 930	3 012
Greece	245	242	203	264	274	279	294	279	221	140	97	57	58	71
Hungary				230	199	193	167	163	66	43	47	52	55	68
Ireland	117	152	146	154	171	177	186	151	56	89	90	73	74	96
Italy	2 430	2 278	2 244	2 264	2 237	2 325	2 494	2 163	2 160	1 954	1 745	1 402	1 304	1 351
Latvia				11	16	25	31	19	5	6	10	10	10	12
Lithuania				9	11	15	21	22	7	7	12	12	12	14
Luxembourg	22	44	44	48	49	51	51	52	47	50	50	49	46	49
Malta				4	7	6	6	5	6	4	6	6	6	6
Netherlands	526	507	487	479	452	478	494	493	396	480	554	500	416	384
Poland				297	230	223	264	305	221	219	275	274	288	304
Portugal		232	194	202	208	199	204	215	159	223	154	96	105	142
Romania							313	286	115	94	82	66	57	70
Slovakia					45	65	65	57	70	65	69	70	66	74
Slovenia				37	64	62	69	72	60	60	55	50	51	54
Spain	400	969	1 319	1 606	1 640	1 622	1 606	1 165	964	976	810	704	732	895
Sweden	223	249	257	260	269	278	300	248	209	277	289	263	252	297
United Kingdom	2 232	2 611	2 558	2 512	2 386	2 295	2 390	2 112	1 968	2 026	1 937	2 036	2 254	2 467

Table A1.2 Average mass of new passenger cars by Member State (kg)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	1 314	1 335	1 426	1 432	1 435	1 449	1 445	1 431	1 385	1 409	1 442	1 453	1 448	1 446
Belgium	1 288	1 319	1 361	1 375	1 396	1 407	1 423	1 425	1 406	1 406	1 416	1 439	1 421	1 415
Bulgaria										1 454	1 462	1 485	1 475	1 424
Croatia													1 309	1 307
Cyprus				1 205	1 277	1 316	1 354	1 372	1 367	1 388	1 377	1 370	1 367	1 391
Czech Republic				1 704	1 242	1 247	1 261	1 275	1 335	1 380	1 368	1 368	1 370	1 364
Denmark		1 306	1 325	1 327	1 324	1 328	1 370	1 320	1 313	1 335	1 312	1 248	1 227	1 216
Estonia				1 349	1 408	1 433	1 465	1 456	1 471	1 473	1 502	1 514	1 508	1 474
Finland	1 752	1 759	1 336	1 355	1 381	1 401	1 437	1 442	1 447	1 426	1 452	1 455	1 445	1 440
France	1 254	1 280	1 305	1 327	1 341	1 349	1 375	1 387	1 326	1 326	1 343	1 385	1 350	1 310
Germany	1 332	1 352	1 381	1 408	1 412	1 424	1 433	1 425	1 347	1 433	1 460	1 466	1 448	1 443
Greece	1 172	1 223	1 262	1 277	1 287	1 304	1 314	1 311	1 423	1 252	1 231	1 242	1 243	1 240
Hungary				1 182	1 203	1 237	1 264	1 288	1 330	1 370	1 396	1 390	1 401	1 398
Ireland	1 248	1 276	1 265	1 314	1 341	1 372	1 441	1 440	1 440	1 380	1 378	1 420	1 397	1 410
Italy	1 604	1 632	1 649	1 259	1 277	1 294	1 287	1 285	1 255	1 269	1 306	1 311	1 314	1 307
Latvia				1 452	1 445	1 468	1 502	1 498	1 535	1 522	1 543	1 563	1 552	1 519
Lithuania				1 433	1 448	1 483	1 481	1 467	1 486	1 481	1 498	1 497	1 486	1 435
Luxembourg	1 834	1 851	1 442	1 471	1 487	1 504	1 498	1 490	1 462	1 473	1 519	1 528	1 505	1 488
Malta								1 317	1 182	1 200	1 216	1 465	1 212	1 199
Netherlands	1 260	1 264	1 301	1 314	1 337	1 332	1 350	1 324	1 295	1 254	1 249	1 266	1 288	1 285
Poland				1 181	1 242	1 271	1 304	1 260	1 261	1 317	1 378	1 383	1 376	1 356
Portugal		1 229	1 254	1 295	1 329	1 352	1 365	1 352	1 344	1 333	1 354	1 361	1 350	1 345
Romania							1 268	1 286	1 291	1 281	1 325	1 381	1 365	1 347
Slovakia					1 174					1 386	1 418	1 421	1 410	1 410
Slovenia				1 246	1 305	1 316	1 340	1 350	1 346	1 332	1 355	1 358	1 344	1 333
Spain	1 266	1 725	1 317	1 335	1 374	1 395	1 416	1 400	1 394	1 399	1 413	1 410	1 396	1 355
Sweden	1 448	1 454	1 472	1 467	1 470	1 488	1 503	1 488	1 490	1 497	1 510	1 522	1 520	1 513
United Kingdom	1 347	1 356	1 392	1 387	1 374	1 390	1 394	1 380	1 358	1 384	1 410	1 398	1 394	1 381

Table A1.3 Average CO_2 emissions from new passenger cars by Member State (g CO_2/km)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	165.6	164.4	163.8	161.9	162.1	163.7	162.9	158.1	150.2	144.0	138.7	135.7	131.6	128.5
Belgium	163.7	161.1	158.1	156.5	155.2	153.9	152.8	147.8	142.1	133.4	127.2	128.0	124.0	121.3
Bulgaria							171.6	171.5	172.1	158.9	151.4	149.2	141.7	135.9
Croatia													127.1	115.8
Cyprus				173.4	173.0	170.1	170.3	165.6	160.7	155.8	149.9	144.3	139.2	129.8
Czech Republic				154.0	155.3	154.2	154.2	154.4	155.5	148.9	144.5	140.8	134.6	131.6
Denmark	172.9	170.0	169.0	165.9	163.7	162.5	159.8	146.4	139.1	126.6	125.0	117.0	112.7	110.2
Estonia				179.0	183.7	182.7	181.6	177.4	170.3	162.0	156.9	150.3	147.0	140.9
Finland	178.1	177.2	178.3	179.8	179.5	179.2	177.3	162.9	157.0	149.0	144.0	139.1	131.8	127.4
France	159.8	156.8	155.0	153.1	152.3	149.9	149.4	140.1	133.5	130.5	127.7	124.4	117.4	114.2
Germany	179.5	177.4	175.9	174.9	173.4	172.5	169.5	164.8	154.0	151.1	145.6	141.6	136.1	132.5
Greece	166.5	167.8	168.9	168.8	167.4	166.5	165.3	160.8	157.4	143.7	132.7	121.1	111.9	108.2
Hungary				158.5	156.3	154.6	155.0	153.4	153.4	147.4	141.6	140.8	134.4	133.0
Ireland	166.6	164.3	166.7	167.6	166.8	166.3	161.6	156.8	144.4	133.2	128.3	125.1	120.7	117.1
Italy	158.3	156.6	152.9	150.0	149.5	149.2	146.5	144.7	136.3	132.7	129.6	126.2	121.1	118.1
Latvia				192.4	187.2	183.1	183.5	180.6	176.9	162.0	154.4	152.0	147.1	140.4
Lithuania				187.5	186.3	163.4	176.5	170.1	166.0	150.9	144.4	144.2	139.8	135.8
Luxembourg	177.0	173.8	173.5	169.7	168.6	168.2	165.8	159.5	152.5	146.0	142.2	137.0	133.4	129.9
Malta				148.8	150.5	145.9	147.8	146.9	135.7	131.2	124.7	121.5	118.7	115.3
Netherlands	174.0	172.4	173.5	171.0	169.9	166.7	164.8	156.7	146.9	135.8	126.1	118.6	109.1	107.3
Poland				154.1	155.2	155.9	153.7	153.1	151.6	146.2	144.5	141.3	138.1	132.9
Portugal		154.0	149.9	147.1	144.9	145.0	144.2	138.2	133.8	127.2	122.8	117.6	112.2	108.8
Romania							154.8	156.0	157.0	148.5	140.7	139.0	132.1	128.2
Slovakia					157.4	152.0	152.7	150.4	146.6	149.0	144.9	141.0	135.1	131.7
Slovenia				152.7	157.2	155.3	156.3	155.9	152.0	144.4	139.7	133.4	125.6	121.3
Spain	156.8	156.4	157.0	155.3	155.3	155.6	153.2	148.2	142.2	137.9	133.8	128.7	122.4	118.6
Sweden	200.2	198.2	198.5	197.2	193.8	188.6	181.4	173.9	164.5	151.3	141.8	135.9	133.2	131.0
United Kingdom	177.9	174.8	172.7	171.4	169.7	167.7	164.7	158.2	149.7	144.2	138.0	132.9	128.3	124.6

Table A1.4 New vans by Member State: registrations (in thousands), mass (kg) and average emissions (g CO_2/km)

	Registrations			Mass			Emissions		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
Austria	26	27	30	1 856	1 860	1 900	186.6	185.8	183.6
Belgium	53	51	52	1 842	1 861	1 883	185.8	182.8	179.4
Bulgaria	8	7	8	1 578	1 592	1 545	160.8	156.3	149.2
Croatia			4			1 668			158.8
Cyprus	1	1	1	1 605	1 734	1 674	151.5	170.6	158.1
Czech Republic	10	10	12	1 827	1 835	1 942	196.0	189.1	191.2
Denmark	11	17	25	1 854	1 793	1 736	178.1	166.8	155.0
Estonia	2	3	3	1 821	1 831	1 831	184.4	182.0	178.1
Finland	10	10	10	1 922	1 910	1 936	193.5	182.0	179.7
France	227	300	348	1 804	1 601	1 625	170.2	152.8	151.6
Germany	195	199	212	2 034	1 911	1 913	195.5	192.9	190.1
Greece	2	3	5	1 634	1 624	1 598	170.3	161.3	157.0
Hungary	8	10	15	1 828	1 845	1 843	184.0	181.9	177.7
Ireland	6	10	16	1 762	1 785	1 778	175.6	177.2	168.7
Italy	106	92	107	1 713	1 707	1 674	168.2	163.5	157.0
Latvia	2	2	2	1 770	1 750	1 728	176.9	171.6	167.4
Lithuania	1	2	2	1 891	1 856	1 830	190.8	180.3	176.3
Luxembourg	3	3	3	1 902	1 857	1 845	188.3	179.2	178.8
Malta	0.4	0.5	0.5	1 507	1 518	1 520	147.5	150.5	145.4
Netherlands	47	49	46	1 777	1 774	1 778	177.5	173.4	167.4
Poland	30	34	61	1 778	1 796	1 779	179.6	176.4	168.5
Portugal	13	17	24	1 579	1 583	1 581	154.2	150.9	144.8
Romania	8	6	8	1 806	1 766	1 781	183.1	171.8	171.9
Slovakia	5	5	5	1 986	1 995	2 026	200.8	196.3	193.2
Slovenia	5	6	5	1 860	1 849	1 877	191.2	188.0	185.1
Spain	65	70	90	1 764	1 734	1 672	167.4	162.9	156.1
Sweden	21	20	26	1 724	1 760	1 811	165.8	167.1	170.4
United Kingdom	232	262	307	1 815	1 827	1 838	186.3	185.2	181.0

Annex 2

Table A2.1 Data used in calculating the CO_2 emission performance of car manufacturers in 2014. The number of registrations represents the number of vehicles having both a mass and an emission value. The parameters used in calculating manufacturer performance for 2014 are set out in Table 2.1

Manufacturer	Pools and Derogations	Number of registrations	Average CO_2 (80%) corrected	Specific emission target	Distance to target
Alpina Burkard Bovensiepen GmbH E Co KG	DMD	753	160.382		
Aston Martin Lagonda Ltd	D	1358	313.382	313	0.382
Audi AG	P12	683 752	121.362	138.499	– 17.137
Audi Hungaria Motor KFT	P12	5018	145.034	131.858	13.176
Automobiles Citroen		594 247	103.142	125.262	– 22.12
Automobiles Peugeot		766 517	102.376	125.348	– 22.972
Avtovaz JSC	P8	831	213.646	125.611	88.035
Bentley Motors Ltd	P12	2 249	285.434	181.668	103.766
Bluecar SAS		1 070	0	123.686	– 123.686
Bluecar Italy SRL		100	0	124.882	– 124.882
Bayerische Motoren Werke AG	P1	791 411	120.841	139.446	– 18.605
BMW M GmbH	P1	6 559	201.232	147.426	53.806
Bugatti Automobiles SAS	P12	17	552.846	160.388	392.458
Byd Auto Industry Company Limited		47	0	179.493	– 179.493
Caterham Cars Limited	DMD	81	152.781		
Chevrolet Italia SPA	P5	66	113	118.182	– 5.182
Chrysler Group LLC	P3	57 945	170.991	158.684	12.307
CNG–Technik GmbH	P4	9	0	143.761	– 143.761
Automobile Dacia SA	P8	372 685	119.789	122.43	– 2.641
Daimler AG	P2	685 857	118.152	139.46	– 21.308
Dongfeng Motor Corporation	DMD	3	165		
Donkervoort Automobielen BV	DMD	10	178		
Dr Motor Company SRL	DMD	305	144.27		
Ferrari SPA	D	2 068	300.285	303	– 2.715
Fiat Group Automobiles SPA	P3	666 763	110.682	119.52	– 8.838
Fisker Automotive Inc		27	53	181.778	– 128.778
Ford Motor Company	P4	21	101.756	134.118	– 32.362
Ford– Werke GmbH	P4	939 427	113.657	127.433	– 13.776
Fuji Heavy Industries Ltd	ND	25 500	152.649	164.616	– 11.967
General Motors Company	P5	3 244	166.887	137.35	29.537
GM Korea Company	P5	32 754	124.841	131.465	– 6.624
Great Wall Motor Company Limited	DMD	460	163.747		

Table A2.1 Data used in calculating the CO_2 emission performance of car manufacturers in 2014. The number of registrations represents the number of vehicles having both a mass and an emission value. The parameters used in calculating manufacturer performance for 2014 are set out in Table 2.1 (cont.)

Manufacturer	Pools and Derogations	Number of registrations	Average CO_2 (80%) corrected	Specific emission target	Distance to target
Gtf Innovations SAS		3 758	116.045	131.844	– 15.799
Honda Automobile China Co Ltd	P6	6 932	124.076	119.643	4.433
Honda Motor Co Ltd	P6	7 402	122.46	131.824	– 9.364
Honda Turkiye AS	P6	550	154.798	126.457	28.341
Honda of the UK Manufacturing Ltd	P6	111 220	124.614	132.954	– 8.34
Hyundai Motor Company	P11	63 440	126.043	136.711	– 10.668
Hyundai Assan Otomotiv Sanayi VE	P11	120 983	110.465	116.176	– 5.711
Hyundai Motor Manufacturing Czech SRO	P11	200 747	133.734	133.128	0.606
Hyundai Motor India Ltd	P11	24 306	111.163	116.467	– 5.304
Isuzu Motors Limited	DMD	64	199.922		
Iveco SPA		2	228	237.075	– 9.075
Jaguar Land Rover Limited	P10/ND	140 214	165.435	178.025	– 12.59
Jiangling Motor Holding Co Ltd	DMD	2	154		
Kia Motors Corporation	P13	216 344	115.439	126.403	– 10.964
Kia Motors Slovakia SRO	P13	130 605	133.612	133.518	0.094
KTM– Sportmotorcycle AG	DMD	21	194		
Lada Automobile GmbH	DMD	833	219.378		
Oao Avtovaz	P8	2	179	129.452	49.548
Automobili Lamborghini SPA	P12	510	317.49	144.398	173.092
Lotus Cars Limited	DMD	569	193.092		
Magyar Suzuki Corporation Ltd	P9/ND	108 700	117.932	123.114	– 5.182
Mahindra & Mahindra Ltd	DMD	221	174.943		
Maruti Suzuki India Ltd	P9/ND	26 905	97.981	123.114	– 25.133
Maserati SPA	P3	5032	190.742	157.313	33.429
Mazda Motor Corporation	ND	159 719	121.968	129.426	– 7.458
Mclaren Automotive Limited	D	342	268.564	280	– 11.436
Mercedes– AMG GmbH	P2	651	261.346	145.494	115.852
MG Motor UK Limited	D	2 280	135.148	149.5	– 14.352
Mia Electric SAS		22	0	108.563	– 108.563
Micro– Vett SPA		6	0	129.772	– 129.772
Mitsubishi Motors Corporation MMC	P7	72 149	85.529	143.547	– 58.018
Mitsubishi Motors Europe BV MME	P7	41	132.688	133.308	– 0.62
Mitsubishi Motors Thailand Co Ltd MMTH	P7	20 075	95.695	109.822	– 14.127
Morgan Motor Co Ltd	DMD	407	173.663		
National Electric Vehicle Sweden	DMD	208	177.229		
Nissan International SA		469 186	103.312	129.031	– 25.719
Adam Opel AG	P5	860 957	122.425	131.518	– 9.093
Pagani Automobili SPA	DMD	2	343		
Perodua Manufacturing SDN BHD	DMD	20	137		
PGO Automobiles	DMD	11	174		
Dr Ing HCF Porsche AG	P12	51 090	182.036	151.881	30.155

Table A2.1 Data used in calculating the CO_2 emission performance of car manufacturers in 2014. The number of registrations represents the number of vehicles having both a mass and an emission value. The parameters used in calculating manufacturer performance for 2014 are set out in Table 2.1 (cont.)

Manufacturer	Pools and Derogations	Number of registrations	Average CO_2 (80%) corrected	Specific emission target	Distance to target
Perusahaan Otomobil Nasional SDN BHD	DMD	11	198.625		
Qoros Automotive Co Ltd	DMD	39	146		
Quattro GmbH	P12	4 874	225.943	153.011	72.932
Renault SAS	P8	871 327	98.779	124.427	– 25.648
Renault Trucks	DMD	24	187.474		
Rolls– Royce Motor Cars Ltd	P1	581	326.254	180.6	145.654
Seat SA	P12	316 545	110.877	124.039	– 13.162
Secma SAS	DMD	41	131		
Skoda Auto AS	P12	546 133	114.628	125.591	– 10.963
Ssangyong Motor Company	D	7 873	170.944	180	– 9.056
Suzuki Motor Corporation	P9/ND	16 467	163.974	123.114	40.86
Suzuki Motor Thailand Co Ltd	P9/ND	740	98.797	123.114	– 24.317
Tata Motors Limited	P10/ND	405	132.66	178.025	– 45.365
Tazzari Gl SPA		21	0	99.137	– 99.137
Tesla Motors Ltd		4 574	0	166.629	– 166.629
Toyota Motor Europe NV SA		538 673	102.286	127.146	– 24.86
Volkswagen AG	P12	1 549 589	113.03	130.532	– 17.502
Volvo Car Corporation		231 912	112.433	143.886	– 31.453
Wiesmann GmbH	DMD	4	289.667		

Notes: The Commission's Implementing Decision confirming the 2014 CO_2 emissions assigns some manufacturers an uncertainty adjustment for 2014 data, which modifies the distance to their targets. Here, the uncertainty is not reported. A detailed description of the uncertainty calculation is presented with the Commission Implementing Decision.

'D' indicates that a derogation for small-volume manufacturers has been granted in accordance with the Commission Implementing Decision.

'DMD' means that a de minimis derogation applies, i.e. a manufacturer that, together with all its connected undertakings, was responsible for fewer than 1 000 new registered vehicles in 2014 does not have to meet a specific emissions target.

'ND' indicates that a derogation for niche manufacturers has been granted in accordance with the Commission Implementing Decision.

'P' indicates that the manufacturer is a member of a pool in accordance with Article 7 of Regulation (EC) No 443/2009.

Table A2.2 Data used in calculating the CO_2 emission performance of light commercial vehicle manufacturers in 2014. The number of registrations represents the number of vehicles having both a mass and an emission value. The parameters used in calculating manufacturer performance for 2014 are set out in Table 1.1

Manufacturer	Pools and Derogations	Number of registrations	Average CO_2 (70%) corrected	Specific emission target	Distance to target
Alke SRL		16	0	222.482	– 222.482
Audi AG	P8	2 653	137.151	175.118	– 37.967
Automobiles Citroen		154 961	127.146	160.663	– 33.517
Automobiles Peugeot		154 473	124.856	160.399	– 35.543
Avtovaz JSC	P7	77	210.189	137.116	73.073
Bluecar SAS		121	0	133.522	– 133.522
Bayerische Motoren Werke AG		2 422	129.18	177.329	– 48.149
BMW M GmbH		243	142.347	190.631	– 48.284
Chrysler Group LLC	P2	1 318	200.728	210.825	– 10.097
CNG-Technik GmbH	P3	621	116.949	152.149	– 35.2
Automobile Dacia SA	P7	21 978	120.885	135.623	– 14.738
Daimler AG	P1	125 357	187.428	217.544	– 30.116
Dongfeng Motor Corporation	DMD	324	153.27		
Dr Motor Company SRL	DMD	2	254		
Esagono Energia SRL	DMD	2	0		
Fiat Group Automobiles SPA	P2	124 796	141.101	172.327	– 31.226
Ford Motor Company of Australia Limited	P3	12 338	213.167	219.493	– 6.326
Ford Motor Company	P3	731	217.325	220.629	– 3.304
Ford-Werke GmbH	P3	178 997	158.184	189.189	– 31.005
Fuji Heavy Industries Ltd	DMD	52	150.5		
Mitsubishi Fuso Truck & Bus Corporation	P1	723	235.611	245.321	– 9.71
Mitsubishi Fuso Truck Europe SA	P1	4	236	241.96	– 5.96
LLC Automobile Plant Gaz	DMD	4	274		
GM Korea Company	P4	29	142.4	171.736	– 29.336
GONOW Auto Co Ltd	D	74	161	175	– 14
Great Wall Motor Company Limited	DMD	279	182.482		
Hebei Zhongxing Automobile Co Ltd	DMD	15	205.2		
Honda Motor Co Ltd		11	147.571	192.34	– 44.769
Honda of The UK Manufacturing Ltd		237	143.721	165.215	– 21.494
Hyundai Motor Company		1 375	145.133	179.341	– 34.208
Hyundai Assan Otomotiv Sanayi VE		782	107.751	112.806	– 5.055
Hyundai Motor Manufacturing Czech SRO		1 285	134.567	150.479	– 15.912
Hyundai Motor India Ltd		3	110	121.029	– 11.029
Isuzu Motors Limited		10 810	192.379	207.105	– 14.726
Iveco SPA		31 381	218.029	244.542	– 26.513
Jaguar Land Rover Limited	D	14 517	255.021	276.93	– 21.909
Kia Motors Corporation	P5	1 378	121.285	145.127	– 23.842
Kia Motors Slovakia SRO	P5	403	116.418	152.246	– 35.828
Lada Automobile GmbH	DMD	55	218.842		
Lada France	P7	13	179	141.392	37.608
Magyar Suzuki Corporation Ltd	DMD	204	114.063		

Table A2.2 Data used in calculating the CO_2 emission performance of light commercial vehicle manufacturers in 2014. The number of registrations represents the number of vehicles having both a mass and an emission value. The parameters used in calculating manufacturer performance for 2014 are set out in Table 2.1 (cont.)

Manufacturer	Pools and Derogations	Number of registrations	Average CO_2 (70%) corrected	Specific emission target	Distance to target
Mahindra & Mahindra Ltd	DMD	178	205.573		
Mazda Motor Corporation	DMD	335	132.235		
M.F.T.B.C.	P1	6	237.75	220.725	17.025
Mia Electric SAS		9	0	100.094	– 100.094
Mitsubishi Motors Corporation MMC	P6/D	2 368	192.202	210	– 17.798
Mitsubishi Motors Europe BV MME	P6/D	430	203.641	210	– 6.359
Mitsubishi Motors Thailand Co Ltd MMTH	P6/D	9 711	202.875	210	– 7.125
Nissan International SA		39 343	140.282	191.926	– 51.644
Adam Opel AG	P4	77 322	156.975	177.176	– 20.201
Piaggio & C SPA	D	2 285	115.871	155	– 39.129
Dr Ing HCF Porsche AG	P8	216	191.166	218.989	– 27.823
Quattro GmbH	P8	12	231.5	197.847	33.653
Renault SAS	P7	204 847	114.825	166.494	– 51.669
Renault Trucks		7 682	214.93	245.61	– 30.68
Seat SA	P8	1 530	98.73	127.899	– 29.169
Skoda Auto AS	P8	9 409	115.061	137.318	– 22.257
Ssangyong Motor Company	D	741	197.079	210	– 12.921
Suzuki Motor Corporation	DMD	190	158.421		
Tata Motors Limited		77	191.358	209.026	–17.668
Toyota Motor Europe NV SA		28 016	181.199	195.431	–14.232
Toyota Caetano Portugal SA	DMD	662	256.985		
Volkswagen AG	P8	185 710	164.086	185.477	–21.391
Volvo Car Corporation		2 406	142.776	183.178	–40.402

Notes: The Commission's Implementing Decision confirming the 2014 CO_2 emissions assigns some manufacturers an uncertainty adjustment for 2014 data, which modifies the distance to their targets. Here, the uncertainty is not reported. A detailed description of the uncertainty calculation is presented with the Commission Implementing Decision.

'D' indicates that a derogation for small-volume manufacturers has been granted in accordance with the Commission Implementing Decision.

'DMD' means that a de minimis derogation applies, i.e. a manufacturer that, together with all its connected undertakings, was responsible for fewer than 1 000 new registered vehicles in 2014 does not have to meet a specific emissions target.

'ND' indicates that a derogation for niche manufacturers has been granted in accordance with Commission Implementing Decision.

'P' indicates that the manufacturer is a member of a pool in accordance with Article 7 of Regulation (EC) No 510/2011.

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