

# CO<sub>2</sub> emissions performance of car manufacturers in 2012

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## Executive summary

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The European Environment Agency (EEA) supports the European Commission in the monitoring of the CO<sub>2</sub> performance of passenger cars, in accordance with Regulation (EC) 443/2009. This regulation sets a CO<sub>2</sub> 'specific emission' <sup>(1)</sup> target of 130 g CO<sub>2</sub>/km by 2015, defined as the average value for each manufacturer's fleet of newly registered passenger cars in the EU in that year <sup>(2)</sup>. The 2015 target is being phased in gradually from 2012. Starting from this year, a specific binding CO<sub>2</sub> target has been calculated for each manufacturer based on the average mass of its fleet (Annex 1).

A long-term target of 95 g CO<sub>2</sub>/km has been set for 2020. The modalities for compliance with that target will be determined by the legislators in the on-going review of the regulation.

In order to evaluate the progress of manufacturers towards their targets, the EEA has collected and quality-checked data on CO<sub>2</sub> emissions from passenger cars registered in all Member States of the European Union <sup>(3)</sup> since 2010. Using the Member

State data, as verified by manufacturers <sup>(4)</sup>, this note provides an overview of the performance of car manufacturers in meeting their CO<sub>2</sub> emission targets.

The main findings are:

- the average specific emissions of the new European fleet in 2012 is 132.2 g CO<sub>2</sub>/km, a reduction of 2.6 % compared to 2011;
- the difference between preliminary average specific emissions (the emissions data reported by each of the Member States) and final average specific emissions data (the emissions data after any corrections made by the manufacturers — see footnote 4) is negligible (< 0.01 g CO<sub>2</sub>/km);
- the average mass of the fleet is 1 402 kg, the heaviest observed in the last three years;
- data collected reveal that in 2012 the majority of the car manufacturers respect their CO<sub>2</sub> emission targets set for 2012.

<sup>(1)</sup> In this context 'specific emissions' means 'emissions per vehicle kilometre'.

<sup>(2)</sup> For the purposes of calculating this average, manufacturers are permitted under the regulation to form pools with other manufacturers. In the event that 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.

<sup>(3)</sup> Data for 2012 were delivered by Croatia, but because the country did not join the European Union until 2013, the Croatian data are not included in this year's report. The Croatian data will only be included starting from 2014 — the first full calendar year in which Croatia is a Member State of the EU.

<sup>(4)</sup> Data on average specific emissions is provided to the EEA and the Commission by EU Member States. These preliminary data are then submitted to manufacturers, who 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 known as final average specific emissions.

# 1 Calculating the CO<sub>2</sub> emissions performance of car manufacturers

To reduce CO<sub>2</sub> emissions in the road transport sector, the European Parliament and the Council adopted Regulation (EC) No 443/2009, which introduced mandatory CO<sub>2</sub> emission performance standards for new passenger cars.

The regulation sets a CO<sub>2</sub>-specific emission target of 130 g CO<sub>2</sub>/km by 2015, defined as the average value for the fleet of newly registered passenger cars in the EU. For the period until 2015, the modalities of compliance with the targets have been established and are presented in this chapter. A long-term target of 95 g CO<sub>2</sub>/km has been set for 2020. The modalities for compliance with that target will be determined by the legislators in the on-going review of the regulation. The review was initiated in July 2012 with a proposal to amend the regulation.

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

1. CO<sub>2</sub> average specific emissions;
2. the specific CO<sub>2</sub> emission target;
3. the difference between the average specific emissions and the specific emission target.

The data used for the calculations of these parameters are collected each year by Member States, based on registrations of new passenger cars. The data were submitted by all Member States by the deadline of 28 February 2013. Once transmitted to the European Commission and the EEA, the data were communicated to manufacturers at the end of April 2013 for verification. Forty manufacturers (representing 74.5 % of the total registrations) verified the data in depth, and notified the Commission of any errors. Eight manufacturers accepted the preliminary data without corrections.

The European Commission has assessed the manufacturers' corrections, and, where justified, taken them into account for the calculation of their average CO<sub>2</sub> emissions and specific emission targets. This note presents the final data for the year 2012, after manufacturers' notifications, and after the Commission decision concerning their validity.

## 1.1 CO<sub>2</sub> average specific emissions

Average specific emissions of CO<sub>2</sub> are calculated as a weighted average of the manufacturer's fleet registered in a particular year. The regulation stipulates that several adjustments to the average specific emissions for each manufacturer must also be considered (Table 1.1). This is in order to take into account the following modalities:

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

### *Phase-in*

A phase-in schedule applies for calculating average specific emissions. 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 will be taken into account in determining the performance of manufacturers. For 2015, 100 % of the new cars of each manufacturer will be taken into account.

### *Super-credits*

The regulation foresees the allocation of super-credits for new passenger cars with CO<sub>2</sub> emissions lower than 50 g CO<sub>2</sub>/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.

### *E85 extra credits*

Additional reductions of average specific emissions are assigned for vehicles capable of running on a mixture of petrol with 85 % ethanol ('E85'). Until 2015, the emissions of these vehicles will be counted as being 5 % less than their actual emissions in recognition of their ability to reduce emissions when running on biofuels. This reduction can be applied only where at least

30 % of the filling stations in the Member State in which the vehicle is registered provide this type of alternative fuel. In 2012 this applied only in the case of Sweden.

### *Eco-innovations*

Certain innovative technologies cannot demonstrate their CO<sub>2</sub>-reducing effects under the current type approval test procedure. In order to support technical development, a manufacturer or supplier can apply to the Commission for the approval of such innovative technologies. The approval conditions are set out in Commission Regulation (EU) 725/2011. If a manufacturer fits its car fleet with an approved eco-innovation, the average emissions of that vehicle may be counted as being a maximum of 7 g CO<sub>2</sub>/km less than it actually is. 2013 was the first year that eco-innovations were submitted to the Commission, and so far, four eco-innovations have been approved in 2013. One eco-innovation is currently being assessed. It is expected that the first vehicles with eco-innovations will be registered in 2013 and should therefore be considered in the calculation of the 2013 target to be published next year.

## **1.2 Specific emission targets**

Each manufacturer has its individual annual target, calculated on the basis of the 'mass in running order' <sup>(5)</sup> of the registered cars. The following formula applies:

$$\text{Specific emissions of CO}_2 = 130 + a \times (M - M_0) \quad (1)$$

Where:

M	is the average mass of the manufacturer's fleet in kilograms (kg)
M <sub>0</sub>	is the reference mass (1 372.0 kg)
a	is 0.0457

This means that if the average mass of a manufacturer's cars in a given year is 1 472 kg, the target for that manufacturer is 134.57 g CO<sub>2</sub>/km. If the average mass of the cars is 1 272 kg, the target will be 125.43 g CO<sub>2</sub>/km.

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

This formula aims to guarantee undistorted competition between manufacturers while taking into account their differences.

### *Pools*

Manufacturers may form a pool with other manufacturers in order to have a common target. In this case, the binding target will be the pool target (calculated on the basis of the whole fleet of the pool registered that year). There were 12 pools declared with regard to the 2012 targets (Table 1.2).

### *Derogations*

Manufacturers selling fewer than 10 000 vehicles per year can apply for a derogation. In this case, a specific emission target consistent with the manufacturer's economic and technological potential to reduce specific CO<sub>2</sub> emissions can be granted. For the year 2012 the Commission has granted 19 derogations.

### *Niche derogations*

Special 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 to the average specific emissions of that manufacturer in 2007. Two niche derogations have been granted for 2012.

<sup>(5)</sup> According to Regulation (EC) No 443/2009 mass in running order means the mass of the car with 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.

**Table 1.1 Summary of the parameters applying to the calculation of manufacturer performance from 2012 to 2016**

	2012	2013	2014	2015	2016
Phase-in	65 %	75 %	80 %	100 %	100 %
Super-credit for vehicle emitting less than 50 g CO <sub>2</sub> /km	3.5	3.5	2.5	1.5	1
Emission reduction for E85 vehicles *	5 %	5 %	5 %	5 %	0 %

**Note:** \* Applies only where at least 30 % of the filling stations in the Member State in which the vehicle is registered provide this type of alternative fuel.

**Table 1.2 Manufacturers' pools in 2012**

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 S.p.A	Chrysler Group LLC Fiat Group Automobiles S.p.A Iveco S.p.A Maserati S.p.A
Ford-Werke GmbH	Ford Motor Company Ford-Werke GmbH Ford Motor Brazil Ford Motor Australia limited Ford India CNG-Technik GmbH
General Motors	Chevrolet Italia S.p.A General Motors Company GM Italia SRL GM Korea Company Adam Opel AG
Honda Motor Europe Ltd	Honda Automobile China Co., Ltd Honda Motor Co., Ltd Honda Turkiye AS Honda of the UK Manufacturing Ltd Honda Automobile Thailand
Mitsubishi Motors	Mitsubishi Motors Corporation MMC Mitsubishi Motors Europe BV MME Mitsubishi Motors Thailand Co Ltd MMTh
Pool Renault	Avtovaz JSC Automobile Dacia SA Renault S.A.S

**Table 1.2 Manufacturers' pools in 2012 (cont.)**

Suzuki	Magyar Suzuki Corporation Ltd Maruti Suzuki India Ltd Suzuki Motor Corporation
Tata Motors Ltd, Jaguar Cars Ltd, Land Rover	Jaguar Land Rover Tata Motors Limited
Toyota-Daihatsu Group	Daihatsu Motor Co., Ltd Toyota Motor Europe NV SA
VW Group PC	Audi AG Audi Hungaria Motor KFT Bentley Motors Ltd Bugatti Automobiles S.A.S Automobili Lamborghini S.p.A Dr. Ing. h.c. F. Porsche AG Quattro GmbH Seat SA Skoda Auto AS Volkswagen AG

**Table 1.3 Manufacturers with derogations granted for 2012**

Manufacturer	Specific emission targets in g CO <sub>2</sub> /km
Aston Martin Lagonda Ltd	320
Caterham Cars Limited	210
Ferrari	303
Great Wall Motor Company Limited	195
Koenigsegg Automotive AB	275
KTM-Sportmotorcycle AG	200
Litex Motors AD	168
Lotus Cars Limited	280
Mahindra & Mahindra Ltd	205
Marussia Motors LLC	270
McLaren Automotive Ltd	285
MG Motor UK Limited	184
Morgan Motor Co. Ltd	180
Noble Automotive Ltd	400
Perusahaan Otomobil Nasional Sdn. Bhd.	185
Potenza	205
Spyker Automobielen B.V	340
Ssangyong Motor Company	180
Wiesmann GmbH	274

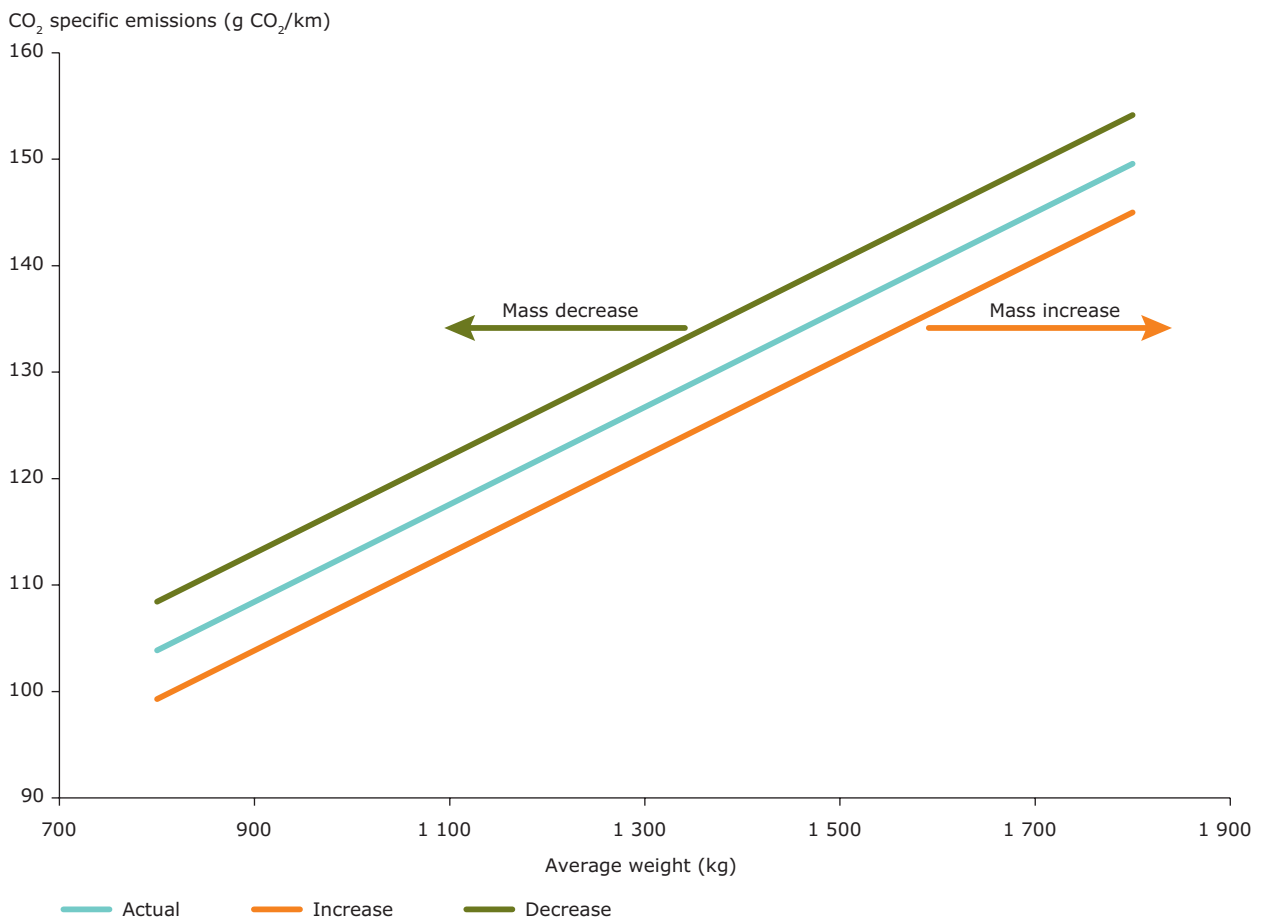
### 1.3 Effect of the average fleet mass on the targets

Emission targets are set according to the average mass in running order of the vehicle fleet, using a limit value curve (see formula 1). This curve is set in such a way that if the average mass of a manufacturer fleet is 1 372 Kg (equal to  $M_0$  in the formula 1), the target for that manufacturer will be 130 g CO<sub>2</sub>/km. According to the regulation, the parameter  $M_0$  in the formula should be adjusted by 2014, in order to reflect changes in vehicles' mass over the previous three calendar years. The adjustment shall take effect from 2016.

As an example, if the average mass of the new fleet in the period 2011–2013 increases by 100 kg to 1 472 kg, the limit values curve will shift towards the right part of the graph in Figure 1.1 (orange line). As a consequence, the target of a manufacturer that produces a fleet with average mass of 1 472 kg will become 130 g CO<sub>2</sub>/km, while the target for that manufacturer was 134.6 g CO<sub>2</sub>/km in 2012 (blue line).

On the basis of data collected in 2011 and 2012, the average mass has increased compared to the  $M_0$  value of 1372 Kg.

**Figure 1.1 Effect of fleet weight on the limit value curve: the blue line is the actual limit value curve; the green line is the limit value curve if  $M_0$  is 1 272 kg; the orange line is the limit value curve if  $M_0$  is 1 472 kg**





## 2 Car manufacturer CO<sub>2</sub> emissions in 2012

### 2.1 Large manufacturers (> 100 000 registrations)

Table 2.1 presents data (number of registrations, average mass and average emissions) for large manufacturers, i.e. those that registered more than 100 000 vehicles in 2012. In total, these manufacturers sold around 11.4 million vehicles in the EU-27 in 2012, equivalent to 94.5 % of the total new registrations. Average emissions of those manufacturers in the previous three years are also presented in Table 2.1.

The average EU emissions of all manufacturers in 2012 were 132.2 g CO<sub>2</sub>/km. The average CO<sub>2</sub> emissions of the large manufacturers were 130.4 g CO<sub>2</sub>/km, i.e. 1.8 g CO<sub>2</sub>/km lower than the average of the entire fleet.

In 2012, eight large manufacturers had average emissions below 130 g CO<sub>2</sub>/km, while in 2011 only six manufacturers were below this value. The average emissions of those large manufacturers varied from 117 g CO<sub>2</sub>/km to 143 g CO<sub>2</sub>/km, with a range of 26 g CO<sub>2</sub>/km. Larger ranges were observed in 2010 and in 2011 (35 g CO<sub>2</sub>/km) and in 2009 (43 g CO<sub>2</sub>/km).

As in the previous years, the Fiat group (Fiat group automobiles) had the lowest average CO<sub>2</sub> emissions (117 g CO<sub>2</sub>/km) among the large manufacturers. Over the period 2000–2012, specific CO<sub>2</sub> emissions of new cars registered in the EU by the Fiat group decreased by 25 %. Downsizing, i.e. the shift to smaller and lighter vehicles, has been one of the drivers for this reduction. In fact, since 2003 the share of small cars in the Fiat fleet increased considerably. Fiat has the lowest average car mass amongst the large manufacturers (1 129 kg). The increasing share of diesel and alternative fuel vehicles in Fiat's fleet, notably those that run on liquefied petroleum gas (LPG) and natural gas (NG), has also contributed to the observed emission reductions. The number of LPG and NG vehicles exceeded 19 % of total Fiat registrations in 2009. This share decreased to 16 % in 2012. Compared to the previous year, Fiat reduced emissions by 1 g CO<sub>2</sub>/km.

Renault and Automobiles Peugeot are two other large manufacturers that considerably reduced their average emissions to 121 g CO<sub>2</sub>/km in 2012. Compared to 2011, Renault and Automobiles Peugeot reduced their average CO<sub>2</sub> emissions by 8 g CO<sub>2</sub>/km and 7 g CO<sub>2</sub>/km respectively.

As in previous years, Toyota Motor Europe continues to produce some of the lowest-emitting cars. Specific CO<sub>2</sub> emissions of new Toyota cars registered in the EU decreased by 29 % over the 2000–2012 period, reaching 122 g/km in 2012. Hybridisation may have contributed to this reduction, but since hybrids are mostly registered as petrol cars, this effect cannot be easily quantified. Toyota has the highest percentage of vehicles with emissions below 100 g CO<sub>2</sub>/km (23 % of its fleet). Since the legislation on car emissions entered into force in 2009, Toyota recorded an average emission decrease (over the following three years) of 10 g CO<sub>2</sub>/km.

A large decrease between 2011 and 2012 can be observed for KIA Motors Corporation: a decline of 7.5 g CO<sub>2</sub>/km compared to the previous year's average emissions. This decrease allows KIA Motors Corporation to respect the 130 g CO<sub>2</sub>/km threshold. 2012 average emissions for the group were 129 g CO<sub>2</sub>/km.

Automobiles Citroën and Ford-Werke decreased their emissions by more than 3 g CO<sub>2</sub>/km in the last year, reaching 129 g CO<sub>2</sub>/km and 123 g CO<sub>2</sub>/km respectively.

All manufacturers in this group decreased their average emissions level in 2012 compared to 2011, except Seat and Hyundai. Compared to 2011, the largest reductions in average emissions were achieved by Daimler AG (9.9 g CO<sub>2</sub>/km) and by Volvo (9.3 g CO<sub>2</sub>/km), even though those manufacturers remain at the bottom of the ranking. Since the legislation on car emissions entered into force in 2009, Audi AG and Daimler AG recorded an average emission decrease (over the following three years) of 22 g CO<sub>2</sub>/km and 24 g CO<sub>2</sub>/km respectively, the greatest decrease amongst the largest manufacturers.

**Table 2.1 Main specific emission statistics for the largest car manufacturers (> 100 000 vehicle registrations per year)**

Manufacturer	Registrations *	Average mass (kg)	Average CO <sub>2</sub> (g CO <sub>2</sub> /km)			
			2012	2011	2010	2009
Fiat Group Automobiles	686 867	1 129	117	118	125	130
Renault S.A.S	800 688	1 301	121	129	134	138
Automobiles Peugeot	773 931	1 381	121	128	131	134
Toyota Motor Europe NV SA	515 587	1 326	122	126	129	132
Automobiles Citroën	656 601	1 366	123	126	131	138
Seat SA	252 174	1 309	127	125	131	140
Ford-Werke GmbH	917 753	1 325	129	132	137	140
Kia Motors Corporation	329 478	1 310	129	137	143	146
Hyundai Motor Company	417 010	1 334	132	132	134	138
Skoda Auto AS	460 608	1 299	132	135	139	148
Volkswagen AG	1 543 537	1 398	133	135	140	151
Adam Opel AG	814 342	1 456	133	134	140	148
Automobile Dacia SA	232 256	1 299	137	143	145	152
Nissan International SA	423 853	1 398	137	142	147	154
Bayerische Motoren Werke AG **	762 099	1 562	138	144	146	151
Audi AG	657 097	1 579	138	145	152	160
GM Korea Company	161 165	1 404	141	142	144	146
Mazda Motor Corporation	113 575	1 361	142	147	149	149
Volvo Car Corporation	204 640	1 694	142	151	157	173
Daimler AG	631 783	1 582	143	153	160	167

**Note:** \* These are total number of registrations in the EU-27, not the registrations used for the calculation of the target and of the average emissions (See Annex 1).

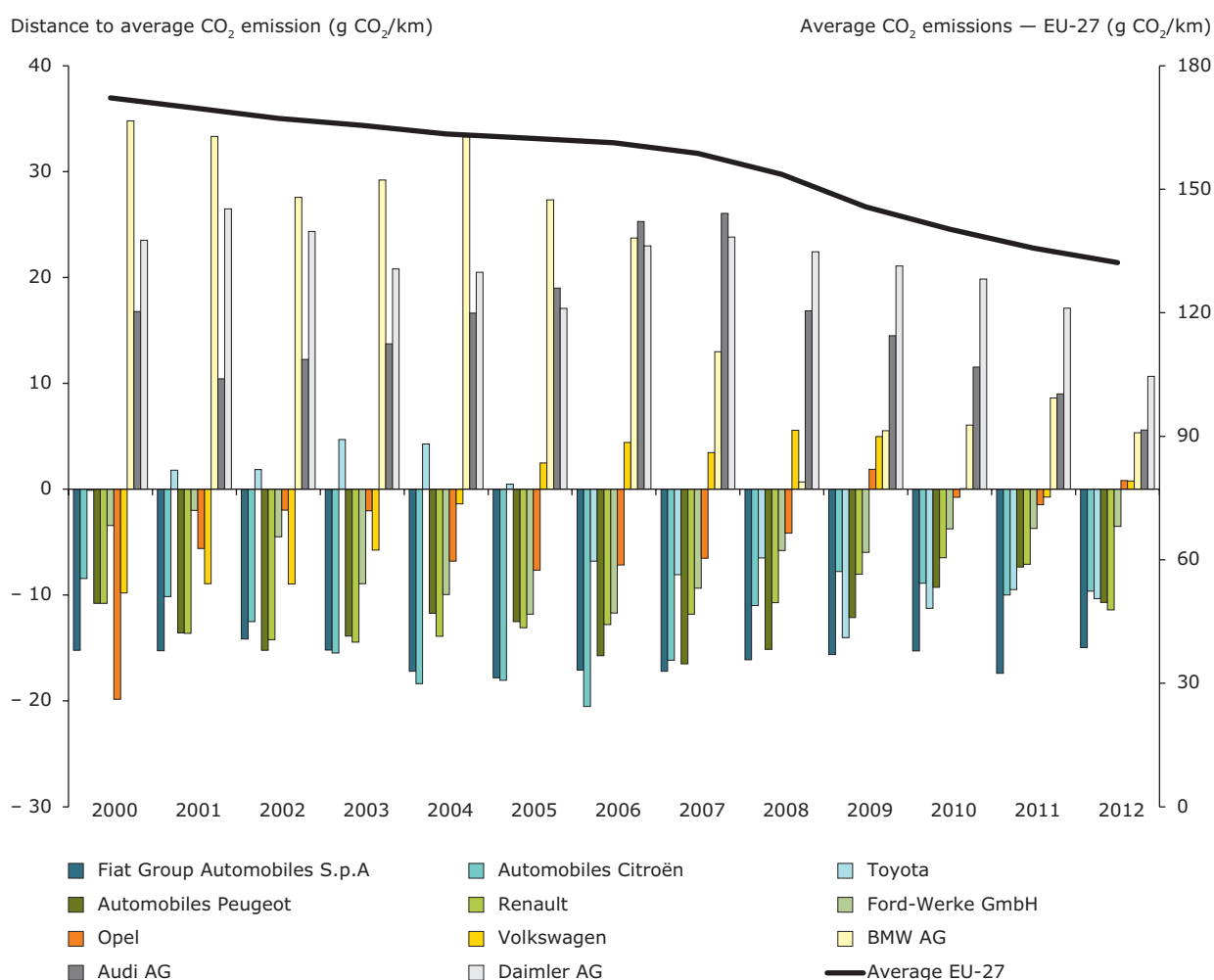
\*\* In 2009, BMW AG included both BMW AG and BMW BmbH.

In Figure 2.1, the average CO<sub>2</sub>-specific emissions in the EU-27 over the period 2000 to 2012 is compared with the performance of some of the largest manufacturers (> 500 000 registrations). Positive bar values mean that the manufacturers' average emissions are higher than the European average emissions; negative bar values mean that the manufacturers' average emissions are lower than the European average emissions. Over the years, some manufacturers more or less followed the trend of the average performance of the European fleet. These manufacturers include Fiat group, Automobiles Peugeot, Renault, and Daimler AG. However, a few manufacturers have continuously improved their emission reductions by more than the reductions made in the average fleet. For example, the average CO<sub>2</sub> emissions of BMW and Toyota have

decreased by 34 % and 29 % respectively since 2000 (compared to an average decrease in emissions of 23 % across the European fleet as a whole). For some manufacturers, average emissions did not follow a uniform path. For example, Toyota's emission performance improved by less than the European average in the period 2000–2005, but its average emissions decreased significantly greater than the European average in the last seven years. Volkswagen, on the other hand, did the reverse. It achieved greater improvements than the European average in the period 2000–2004, but smaller improvements in the past eight years.

As a general observation, dieselisation <sup>(6)</sup> (the introduction of more diesel vehicles) is one of the main drivers for the emissions reductions of the

<sup>(6)</sup> Diesel vehicles generally emit more air pollutants per kilometre than their conventional petrol equivalents. This is particularly true for diesel vehicle emissions of black carbon, which has impacts on health and the climate, but diesel vehicles also emit more PM and more NO<sub>x</sub> per kilometre than conventional-petrol-powered cars.

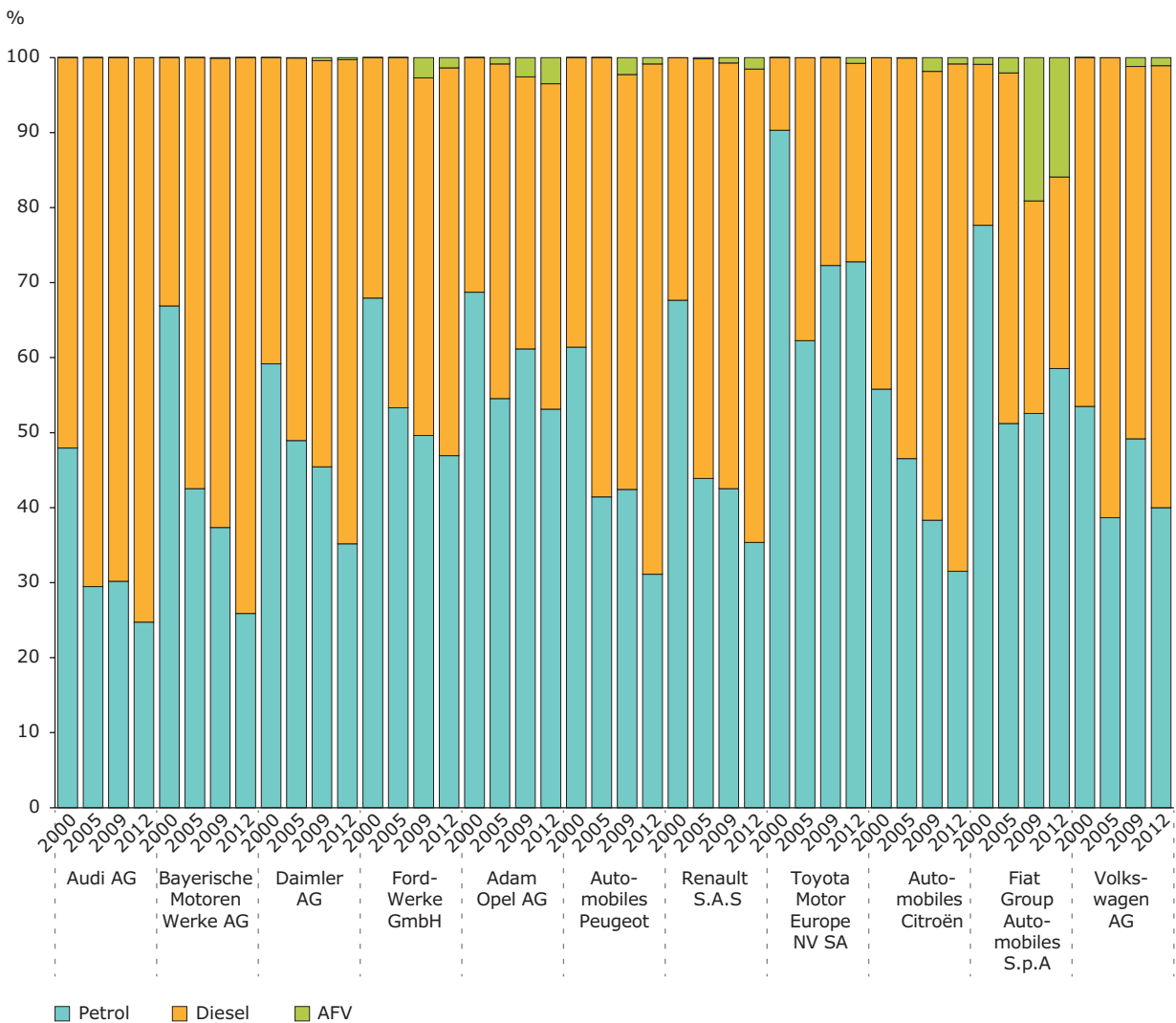
**Figure 2.1 Average CO<sub>2</sub>-specific emissions (g CO<sub>2</sub>/km) and manufacturers' distance to average European CO<sub>2</sub>-specific emissions**

**Note:** Data for the time series 2001–2009 were gathered via the monitoring regulated by Decision 1753/2000/EC, which was repealed by Regulation 443/2009 in 2009. These data do not include all Member States in all years. Manufacturers' names and groups may have changed. Moreover, due to changes in methodology and monitoring improvements, breaks in trends may occur. Please see <http://www.eea.europa.eu/publications/monitoring-co2-emissions-from-new>.

large manufacturers (Figure 2.2). Registrations of diesel vehicles have increased consistently over the years, but for some manufacturers their share of diesel cars has stabilised over the last couple of years. Despite an increasing trend, the share of 'alternative-fuelled' vehicles (vehicles powered by anything except diesel and conventional petrol) remains low in absolute terms, and hence has not contributed significantly to the observed emissions reductions.

The distribution of emissions (Figure 2.3) shows that for some manufacturers (Fiat group, Toyota motor Europe, and Renault) the market for low-emitting vehicles (below 50 g CO<sub>2</sub>/km) is becoming relevant. Vehicles with emissions below 130 g CO<sub>2</sub>/km account for the largest share of registrations for half of the large manufacturers.

**Figure 2.2 Fuel type distribution for the largest manufacturers (> 500 000 vehicle registrations per year)**



**Note:** AFV means alternative fuel vehicles (i.e. electric vehicles, natural gas fuel vehicles).

Data for the time series 2001–2009 were gathered via the monitoring regulated by Decision 1753/2000/EC, which was repealed by Regulation 443/2009 in 2009. These data do not include all Member States in all years. Manufacturers' names and groups may have changed. Moreover, due to changes in methodology and monitoring improvements, breaks in trends may occur. Please see <http://www.eea.europa.eu/publications/monitoring-co2-emissions-from-new>.

**Figure 2.3 Emissions distributions (g CO<sub>2</sub>/km) and number of new registrations by manufacturers (> 100 000 vehicle registrations per year)**



**2.2 Small volume manufacturers (< 10 000 registrations)**

The average CO<sub>2</sub> emissions for the 51 small-volume manufacturers that are each responsible for less than 10 000 vehicle registrations a year, were 206 g CO<sub>2</sub>/km in 2012, figure comparable to last year one (205 g CO<sub>2</sub>/km). In total, about 50 000 vehicles were registered for this group of manufacturers in 2012.

This corresponds to a very small percentage of the total number of registrations. In this group, seven manufacturers produced only electric vehicles (Cecomp S.p.A., Micro-Vett, MIA, Tesla, Think Global, Zotye holding NG group and Vehicules electriques pininfarina-bollere) and were responsible for 2 255 registrations in 2012.

### 2.3 Niche manufacturers (10 000–100 000 registrations)

The average CO<sub>2</sub> emissions for the 14 manufacturers registering more than 10 000 – but less than 100 000 – vehicles a year each were 159 g CO<sub>2</sub>/km. In total, this group is responsible for 5.1 % of the registrations. The variability in average emissions in this group is quite high due to the diverse vehicle segments included in the group (small cars, sports cars). Maruti Suzuki India Ltd reported the lowest

average CO<sub>2</sub> emissions of this group (Table 2.3), i.e. 103 g CO<sub>2</sub>/km (14 g CO<sub>2</sub>/km lower than the lowest average in the group of major manufacturers) and also had the lowest average mass of all registered cars in the EU. The highest average CO<sub>2</sub> emissions of a manufacturer in this group is 205 g CO<sub>2</sub>/km.

Four manufacturers of this group, representing 23 % of the registrations in the group, were below 130 g CO<sub>2</sub>/km.

**Table 2.3 Main statistics for manufacturers registering 10 000–100 000 vehicles per year**

Manufacturer	Registration	Average mass (kg)	Average CO <sub>2</sub> emissions (g CO <sub>2</sub> /km)			
			2012	2011	2010	2009
Maruti Suzuki India Ltd	21 574	932	103	104	104	104
Honda Automobile China Co., Ltd	17 668	1 151	125	125	126	*
Mitsubishi Motors Europe BV MME	18 604	1 121	126	120	127	*
Magyar Suzuki Corporation Ltd	84 045	1 160	128	128	137	138
Honda Motor Co., Ltd	71 867	1 394	139	142	144	*
Suzuki Motor Corporation	46 255	1 243	148	148	144	146
Audi Hungaria Motor KFT	11 241	1 451	149	149	*	*
Mitsubishi Motors Corporation MMC	48 710	1 611	151	154	165	*
Honda of the UK Manufacturing Ltd	40 779	1 510	156	161	162	*
Fuji Heavy Industries Ltd	29 563	1 562	161	170	179	178
Jaguar	22 642	1 911	169	189	197	196
Land Rover	98 774	2 124	191	211	231	244
Chrysler Group LLC	57 045	2 021	193	192	215	216
Dr. Ing. h.c. F. Porsche AG	42 306	1 865	205	222	239	256

**Note:** \* Manufacturers not available in 2009 or 2010 submission.

### 3 Distance to the 2012 target

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The distance of manufacturers to their specific emission targets is calculated by taking into account the adjustments listed in Chapter 1 (phase in, super-credits, E85 reductions and eco-innovations).

Based on their average CO<sub>2</sub> emissions in 2012, 55 manufacturers out of 85, representing 98 % of the registrations in the EU, achieved their specific emission targets for the year 2012 (including derogations). If we consider the pools, 72 manufacturers out of 85 respected their target.

A small number of manufacturers did not meet their specific emission targets in 2012. These are all small-volume manufacturers with less than 10 000 registrations. All companies concerned have either close production since 2012, or would fall within the scope of the proposed *de minimis* threshold, according to which manufacturers with less than 1 000 registrations will be exempt from achieving a specific emission target. The European Parliament and the Council are currently considering the introduction of this exemption giving it retroactive effect with regard to the 2012 targets.

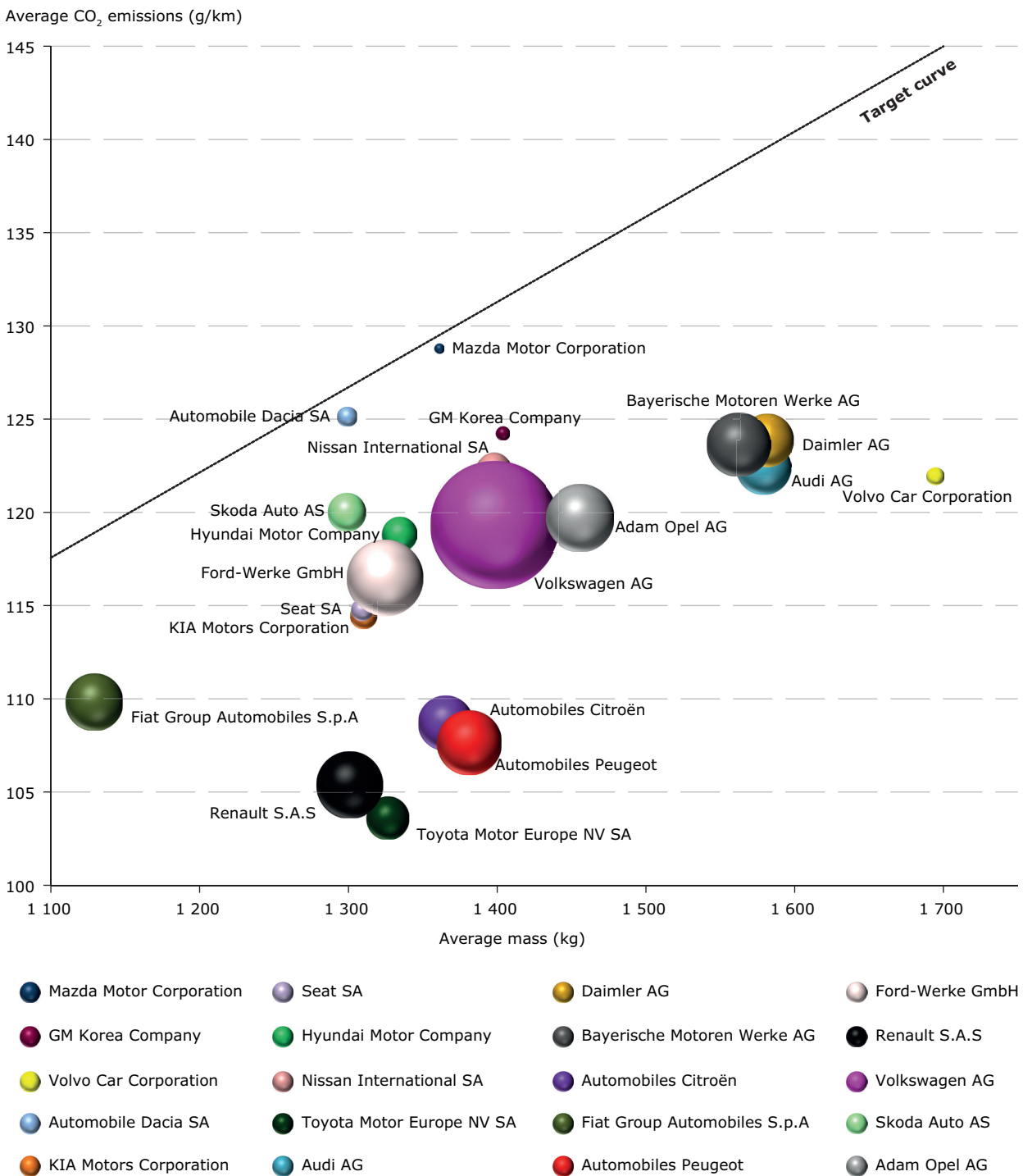
Figure 3.1 presents the distance-to-target curve for the 20 largest manufacturers. In 2010, 14 of the 20 larger manufacturers achieved the 2012 target set by the regulation. In 2011, 18 out of 20 achieved it. In 2012, all the largest manufacturers are respecting their target.

As explained in Chapter 1, the limit value curve implies that heavier cars are allowed higher emissions than lighter cars. As a result, the specific CO<sub>2</sub> emission targets of this group range from 119 to 145 g CO<sub>2</sub>/km.

Compared to 2011, Automobile Dacia and Mazda Motor Corporation were able to improve their performance, and decreased their emissions levels below their targets. The data presented in Figure 3.1 are set out in Annex 1.

The distance to target for pools of manufacturers is presented in Table 3.1. In 2012, all the pools respected their specific emissions' targets.

**Figure 3.1 Distance to 2012 target by individual manufacturers (only manufacturers registering > 100 000 vehicles in Europe)**



**Note:** The size of the bubble is proportional to the number of vehicles registered in Europe.



**Table 3.1 Distance to target for the pools in 2012**

Pool	Manufacturer	Average emissions (g CO <sub>2</sub> /km)	Target (g CO <sub>2</sub> /km)	Distance to target (g CO <sub>2</sub> /km)
	Bayerische Motoren Werke AG	124	139	- 15
	BMW M GmbH	231	151	80
	Rolls-Royce Motor Cars Ltd	317	182	135
<b>BMW Group</b>		<b>124</b>	<b>139</b>	<b>- 15</b>
	Daimler AG	124	140	- 16
	Mercedes-AMG GmbH	177	151	26
<b>Daimler AG</b>		<b>124</b>	<b>140</b>	<b>- 16</b>
	Chrysler Group LLC	177	160	18
	Fiat Group Automobiles S.p.A	110	119	- 9
	Iveco S.p.A	143	224	- 81
	Maserati S.p.A	343	158	185
<b>Fiat Group Automobiles S.p.A</b>		<b>111</b>	<b>122</b>	<b>- 11</b>
	Ford-Werke GmbH	116	128	- 11
	CNG-Technik GmbH	114	118	- 4.2
<b>Ford-Werke GmbH</b>		<b>116</b>	<b>128</b>	<b>- 11</b>
	Mitsubishi Motors Corporation MMC	126	141	- 15
	Mitsubishi Motors Europe BV MME	118	119	- 0.9
<b>Mitsubishi Motors</b>		<b>122</b>	<b>135</b>	<b>- 13</b>
	Chevrolet Italia S.p.A	110	115	- 4.7
	General Motors Company	130	154	- 24
	GM Italia SRL	119	124	- 5
	GM Korea Company	124	131	- 7.2
	Adam Opel AG	120	134	- 14
<b>General Motors</b>		<b>120</b>	<b>133</b>	<b>- 14</b>
	Honda Automobile China Co., Ltd	123	120	3.5
	Honda Motor Co., Ltd	122	131	- 9.4
	Honda of the UK Manufacturing Ltd	139	136	2.8
	Honda Türkiye AS	155	129	26
<b>Honda Motor Europe Ltd</b>		<b>125</b>	<b>131</b>	<b>- 6.1</b>
	Avtovaz JSC	208	126	82
	Automobile Dacia SA	125	127	- 1.5
	Renault S.A.S	105	127	- 21
<b>Pool Renault</b>		<b>109</b>	<b>127</b>	<b>- 17</b>
	Suzuki Motor Corporation	131	124	7
	Maruti Suzuki India Ltd	101	110	- 8.7
	Magyar Suzuki Corporation Ltd	119	120	- 1.6
<b>Suzuki</b>		<b>116</b>	<b>120</b>	<b>- 4.5</b>
	Daihatsu Motor Co., Ltd	132	121	11
	Toyota Motor Europe NV SA	104	128	- 24
<b>Toyota-Daihatsu Group</b>		<b>104</b>	<b>128</b>	<b>- 24</b>
	Jaguar	151	178	- 27
	Land Rover	167	178	- 11
	Tata Motors Limited	134	178	- 44
<b>Tata Motors Ltd, Jaguar Cars Ltd, Land Rover</b>		<b>163</b>	<b>178</b>	<b>- 15</b>
	Audi AG	122	139	- 17
	Audi Hungaria Motor KFT	137	134	3.7
	Bentley Motors Ltd	310	181	129
	Bugatti Automobiles S.A.S	539	157	382
	Automobili Lamborghini S.p.A	344	144	199
	Dr. Ing. h.c. F. Porsche AG	188	153	35
	Quattro GmbH	219	147	72
	Seat SA	115	127	- 12
	Skoda Auto AS	120	127	- 6.6
	Volkswagen AG	119	131	- 12
<b>VW Group PC</b>		<b>120</b>	<b>132</b>	<b>- 12</b>

### 3.1 Effect of super-credit on the 20 largest manufacturers

Regulation (EC) No 443/2009 gives manufacturers incentives to produce vehicles with very low emissions (below 50 g CO<sub>2</sub>/km). As explained in Chapter 1, each low-emitting car will be counted as 3.5 vehicles in 2012 for the calculation of the fleet average. This approach was adopted in order to incentivize manufacturers to further reduce the average emissions of their fleet.

Table 3.2 reports the average emissions calculated (including and excluding the super-credits for the

20 largest manufacturers). It is noted that even when excluding the super-credits from the calculation of the CO<sub>2</sub> average emissions, all the largest manufacturers are respecting their 2012 target. The effect of the super-credits on the average fleet emissions is below 3.1 g CO<sub>2</sub>/km.

Even if the number of low-emitting vehicles will increase in the future, the effect of super-credit on CO<sub>2</sub>-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 onwards.

**Table 3.2 Performance of the largest manufacturers including or not super-credits adjustments**

Manufacturer	CO <sub>2</sub> -specific emissions	Target	Distance to target	CO <sub>2</sub> -specific emissions – no super-credit	Distance to target – no super-credit	Difference with or without super-credit
Mazda Motor Corporation	128 793	129	- 0 701	128 793	- 0.701	0.000
GM Korea Company	124 248	131	- 7 196	124 248	- 7.196	0.000
Volvo Car Corporation	121 944	145	- 22 792	122 26	- 22.476	0.316
Automobile Dacia SA	125 132	127	- 1 532	125 132	- 1.532	0.000
KIA Motors Corporation	114 489	127	- 12 686	114 489	- 12.686	0.000
Seat SA	114 757	127	- 12 367	114 77	- 12.354	0.013
Hyundai Motor Company	118 808	128	- 9 458	118 808	- 9.458	0.000
Nissan International SA	122 253	131	- 8 924	125 392	- 5.785	3.139
Skoda Auto AS	120 028	127	- 6 627	120 028	- 6.627	0.000
Toyota Motor Europe NV SA	103 613	128	- 24 299	104 933	- 22.979	1.320
Audi AG	122 411	139	- 17 062	122 411	- 17.062	0.000
Daimler AG	123 873	140	- 15 703	124 65	- 14.926	0.777
Bayerische Motoren Werke AG	123 643	139	- 15 053	123 679	- 15.017	0.036
Automobiles Citroën	108 718	130	- 20 985	110 324	- 19.379	1.606
Fiat Group Automobiles S.p.A	109 841	119	- 9 045	109 841	- 9.045	0.000
Automobiles Peugeot	107 648	130	- 22 765	109 022	- 21.391	1.374
Adam Opel AG	119 708	134	- 14 113	121 826	- 11.995	2.118
Ford-Werke GmbH	116 480	128	- 11 352	116 48	- 11.352	0.000
Renault S.A.S	105 396	127	- 21 348	106 087	- 20.657	0.691
Volkswagen AG	119 343	131	- 11 860	119 351	- 11.852	0.008

**Note:** If the difference is 0.000, the manufacturer does not produce low emitting vehicles (< 50 g CO<sub>2</sub>/km).

## 4 Distance to the 2013–2015 targets

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The distance of the largest manufacturers to their targets is calculated based on the 2012 CO<sub>2</sub> emission data.

The 2013–2015 progression towards the target is calculated on the basis of the adjustments reported in Table 1.1. A different set of adjustments is applied in every year of this period. For example, for the year 2015, the calculation includes 100 % of the vehicle fleet, and manufacturers receive super-credits in the order of 1.5 cars for vehicles emitting less than 50 g CO<sub>2</sub>/km (Figure 4.1). Manufacturers have two more years to further reduce CO<sub>2</sub> emissions and ensure compliance with their targets in 2015. In general, if car manufacturers continue to reduce emissions as in past years they will meet the 2015 targets.

Already in 2012, among the 20 large manufacturers:

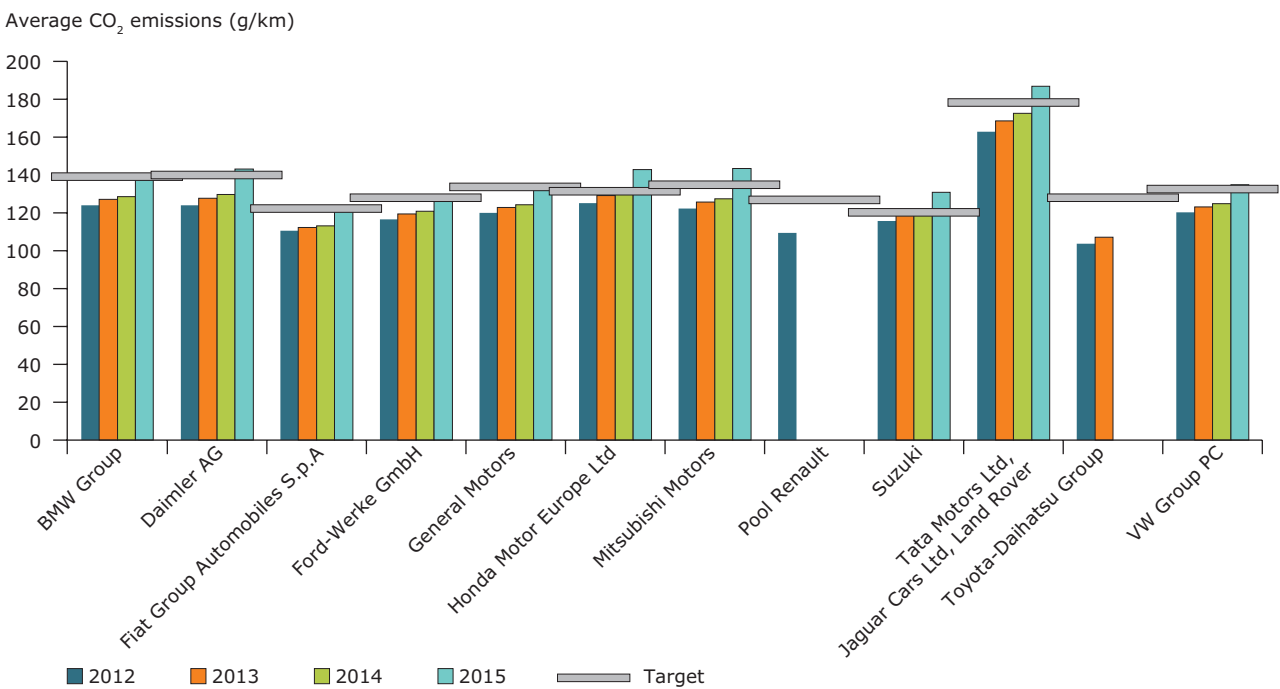
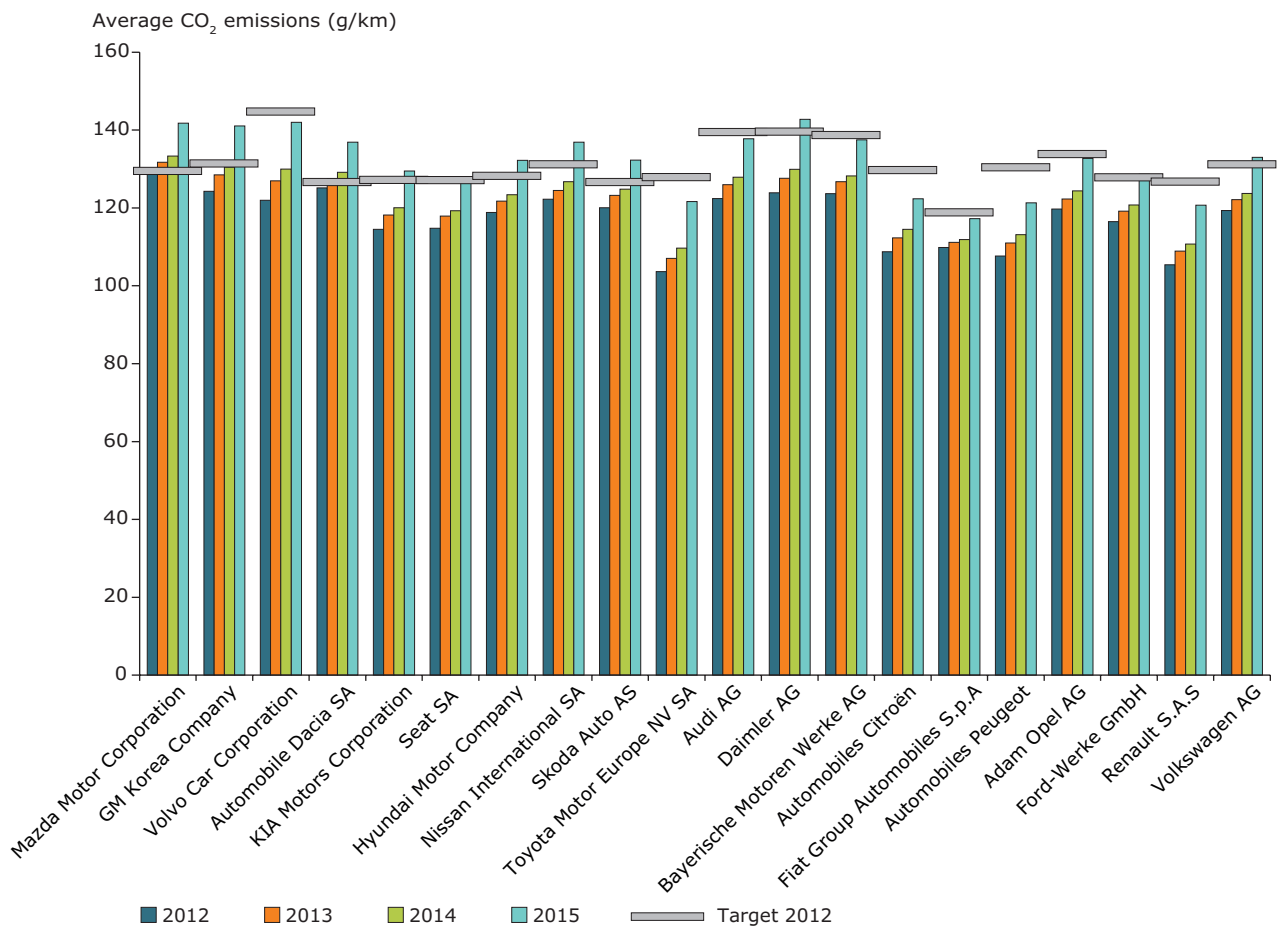
- nine manufacturers (Audi AG, BMW AG, Automobiles Citroën, Fiat group, Ford-Werke, Adam Opel, Automobiles Peugeot, Seat, Toyota Motor Europe, and Volvo car corporation) are compliant with their 2015 targets;
- eighteen manufacturers are compliant with their 2013 and 2014 targets.

In order to be compliant with the 2015 targets, six manufacturers have to reduce the average emissions of their fleets by less than 5 g CO<sub>2</sub>/km over the next three years. Only two manufacturers have to reduce the average emissions by more than 10 g CO<sub>2</sub>/km over the same period.

It should be noted that further pooling agreements between manufacturers can also be expected, which may change these estimates further.

The complete data presented in Figure 4.1 (by manufacturers and by pools) are set out in Annex 1.

**Figure 4.1 Distance to 2012–2015 targets by manufacturers (top) and by pools (bottom) in 2012 (only manufacturers registering > 100 000 vehicles in Europe)**



**Note:** Targets are calculated on the basis of 2012 data. Renault pool is valid for 2012 only. Toyota pool is valid for 2011 and 2013 only.

## 5 Excess emission premiums

If a manufacturer's or pool's average specific CO<sub>2</sub> 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<sub>2</sub> emission target is calculated by multiplying the following three elements:

- the distance to the emission target in a given year (in g CO<sub>2</sub>/km);
- the number of vehicles registered by the manufacturer during that year;
- the premium level as described in Table 5.1.

The premium amounts to EUR 5 for the first g CO<sub>2</sub>/km of exceedance, EUR 15 for the second g CO<sub>2</sub>/km, EUR 25 for the third g CO<sub>2</sub>/km, and EUR 95 for each subsequent g CO<sub>2</sub>/km. A higher distance to the target therefore implies a higher excess premium per g CO<sub>2</sub>/km emitted (Table 5.1).

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<sub>2</sub>/km, the first formula in Table 5.1 applies and the excess emission premium =  $0.5 * 5 * 100\ 000 =$  EUR 250 000;
- if the distance to the target is 1.5 g CO<sub>2</sub>/km, the second formula in Table 5.1 applies and the excess emission premium =  $(1 * 5 + (1.5-1) * 15) * 100\ 000 =$  EUR 1 250 000;
- if the distance to the target is 2.5 g CO<sub>2</sub>/km, the third formula in Table 5.1 applies and the excess emission 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<sub>2</sub>/km, the fourth formula in Table 5.1 applies and the excess emission premium =  $(1 * 5 + 1 * 15 + 1 * 25 + (3.5-3) * 95) * 100\ 000 =$  EUR 9 250 000.

**Table 5.1 Coefficients to be used in the formula for calculating excess emissions premium**

Excess emission (g CO <sub>2</sub> /km)	Fine (EUR)				No 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 target or excess emission; 'NV' is the number of vehicles registered.

## Annex 1

The table below presents data used in calculating the CO<sub>2</sub> emission performance of car manufacturers in 2012. 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 2012 are set out in Table 1.1.

Manufacturer name	Pools and derogations	Number of registrations	Average CO <sub>2</sub> (65 %) corrected	Specific emission target	Distance to target
Alpina Burkard Bovensiepen GmbH E Co., KG		459	156.768	152.125	4.643
Artega Automobil GmbH E Co., KG		4	223.000	126.024	96.976
Aston Martin Lagonda Ltd	D	1 549	296.355	320.000	- 23.645
Audi AG	P12	657 068	122.411	139.473	- 17.062
Audi Hungaria Motor KFT	P12	11 241	137.324	133.613	3.711
Automobiles Citroën		654 993	108.718	129.703	- 20.985
Automobiles Peugeot		773 864	107.648	130.413	- 22.765
Avtovaz JSC	P8	2 298	207.903	125.748	82.155
Bentley Motors Ltd	P12	1 992	310.230	181.440	128.790
Bayerische Motoren Werke AG	P1	762 027	123.643	138.696	- 15.053
BMW M GmbH	P1	6 375	231.079	151.103	79.976
Bugatti Automobiles S.A.S	P12	2	539.000	156.689	382.311
Caterham Cars Limited	D	139	174.178	210.000	- 35.822
CECOMP S.p.A.		1 001	0.000	123.282	- 123.282
Chevrolet Italia S.p.A	P5	4 948	110.000	114.681	- 4.681
Chrysler Group LLC	P3	57 034	177.442	159.650	17.792
CNG-Technik GmbH	P4	75	113.938	118.091	- 4.153
Automobile Dacia SA	P8	232 256	125.132	126.664	- 1.532
Daihatsu Motor Co., Ltd	P11	3 397	131.952	120.887	11.065
Daimler AG	P2	631 475	123.873	139.576	- 15.703
Dongfeng Motor Corporation		2	184.000	118.758	65.242
DR Motor Company SRL		645	126.489	122.520	3.969
Ferrari S.p.A	D	2 330	298.539	303.000	- 4.461
Fiat Group Automobiles S.p.A	P3	686 449	109.841	118.886	- 9.045
Fisker Automotive INC		166	53.000	181.778	- 128.778
Ford-Werke GmbH	P4	917 725	116.480	127.832	- 11.352
Fuji Heavy Industries Ltd	D	29 381	150.266	164.616	- 14.350
General Motors Company	P5	2 673	130.061	154.444	- 24.383
GM Italia SRL	P5	2	119.000	123.968	- 4.968
GM Korea Company	P5	161 153	124.248	131.444	- 7.196
Great Wall Motor Company Limited	D	309	168.000	195.000	- 27.000
Honda Automobile China Co., Ltd	P6	17 668	123.408	119.912	3.496
Honda Motor Co., Ltd	P6	71 717	121.571	130.995	- 9.424

Manufacturer name	Pools and derogations	Number of registrations	Average CO <sub>2</sub> (65 %) corrected	Specific emission target	Distance to target
Honda Turkiye AS	P6	2 207	154.787	128.725	26.062
Honda of the UK Manufacturing Ltd	P6	40 779	139.093	136.324	2.769
Hyundai Motor Company		416 987	118.808	128.266	- 9.458
Iveco S.p.A	P3	6	143.333	224.310	- 80.977
Jaguar	ND/P10	22 621	150.844	178.025	- 27.181
Jiangling Motor Holding Co., Ltd		39	144.480	130.348	14.132
KIA Motors Corporation		329 474	114.489	127.175	- 12.686
KTM-Sportmotorcycle AG	D	18	180.000	200.000	- 20.000
Automobili Lamborghini S.p.A	P12	413	343.683	144.315	199.368
Land Rover	ND/P10	98 731	167.445	178.025	- 10.580
Lotus Cars Limited	D	335	163.447	280.000	- 116.553
Magyar Suzuki Corporation Ltd	P9	84 045	118.669	120.317	- 1.648
Mahindra & Mahindra Ltd	D	64	179.000	205.000	- 26.000
Maruti Suzuki India Ltd	P9	21 574	101.217	109.891	- 8.674
Maserati S.p.A	P3	883	343.492	158.286	185.206
Mazda Motor Corporation		113 565	128.793	129.494	- 0.701
Mclaren Automotive Limited	D	335	279.000	285.000	- 6.000
Mercedes-AMG GmbH	P2	2 939	177.053	151.465	25.588
MG Motor UK Limited	D	755	176.147	184.000	- 7.853
MIA Electric S.A.S		494	0.000	107.916	- 107.916
Micro-Vett S.p.A		5	0.000	130.091	- 130.091
Mitsubishi Motors Corporation MMC	P7	48 688	126.281	140.924	- 14.643
Mitsubishi Motors Europe BV MME	P7	18 604	117.601	118.511	- 0.910
Mitsubishi Motors Thailand Co Ltd MMTTh	P7	15	97.778	123.575	- 25.797
Morgan Motor Co Ltd	D	398	156.050	180.000	- 23.950
Nissan International SA		423 818	122.253	131.177	- 8.924
OMCI SRL		21	148.000	116.656	31.344
Adam Opel AG	P5	814 229	119.708	133.821	- 14.113
Perodua Manufacturing SDN BHD		372	136.934	113.647	23.287
Dr. Ing. h.c. F. Porsche AG	P12	42 299	187.954	152.535	35.419
Perusahaan Otomobil Nasional Sdn. Bhd.	D	206	146.511	185.000	- 38.489
Quattro GmbH	P12	3 904	219.136	147.404	71.732
Radical Motorsport Ltd		6	229.000	106.145	122.855
Renault S.A.S	P8	800 674	105.396	126.744	- 21.348
Rolls-Royce Motor Cars Ltd	P1	417	317.376	181.976	135.400
Saab Automobile AB		1 297	151.696	144.382	7.314
Seat SA	P12	252 173	114.757	127.124	- 12.367
SECMA S.A.S		40	131.000	97.370	33.630
Shijiazhuang Shuanghuan Automobile Company		10	269.667	154.130	115.537
Skoda Auto AS	P12	460 603	120.028	126.655	- 6.627
Spyker Automobielen BV	D	2	340.000	340.000	0.000

Manufacturer name	Pools and derogations	Number of registrations	Average CO <sub>2</sub> (65 %) corrected	Specific emission target	Distance to target
Ssangyong Motor Company	D	4 967	167.641	180.000	- 12.359
Suzuki Motor Corporation	P9	46 255	131.108	124.115	6.993
Tata Motors Limited	ND/P10	592	134.367	178.025	- 43.658
Tesla Motors Ltd		159	0.000	128.309	- 128.309
Think		52	0.000	118.360	- 118.360
Toyota Motor Europe NV SA	P11	515 028	103.613	127.912	- 24.299
Vehicules Electriques Pininfarina-Bollere S.A.S.		542	0.000	123.282	- 123.282
Volkswagen AG	P12	1 535 755	119.343	131.203	- 11.860
Volvo Car Corporation		204 539	121.944	144.736	- 22.792
Wiesmann GmbH	D	53	284.294	274.000	10.294
Zhejiang Zotye Automobile Manufacturing Co., Ltd		2	0.000	128.172	- 128.172

**Notes:** The Commission's Implementing Decision confirming the 2012 CO<sub>2</sub> emissions assigns some manufacturers an uncertainty adjustment for 2012 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 ([http://ec.europa.eu/clima/policies/transport/vehicles/cars/documentation\\_en.htm](http://ec.europa.eu/clima/policies/transport/vehicles/cars/documentation_en.htm)). In most cases the range of uncertainty is below 1 g CO<sub>2</sub>/km.

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

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

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





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