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BRIEFING

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CO_2 emissions from new passenger cars in the EU: Car manufacturers' performance in 2015

The purpose of this briefing paper is to provide a summary of CO_2 emissions levels of new passenger cars in the European Union (EU) in 2015. The briefing is based on the preliminary dataset recently released by the European Environment Agency (EEA) on monitoring CO_2 emissions from new passenger cars in the EU. The EEA data show that the mandatory emission reduction target set by the EU legislation for 2015 has been met on average. New cars sold in the EU in 2015 had average CO_2 emissions of 119.6 g CO_2/km, which was 8% below the 2015 target, and 3% lower than in 2014.

As a follow-up to the previous year's briefing,[1] this paper details manufacturers' performance in terms of CO_2 emissions reduction, fuel and technology trends, and market share. The paper focuses on differences between Member States, as well as between the major manufacturer groups. It also discusses the impact of the super-credit provision on the average CO_2 emissions values of manufacturer groups.

All manufacturer groups met their mandatory CO_2 emission limits in 2015, and some of them are well on their way to reaching the 2020/21 target. The 2020/21 target requires an additional reduction of approximately 27% in average CO_2 emissions compared to 2015 levels. PSA Group and Toyota-Daihatsu have average CO_2 emissions levels that

1 Zacharof, N., Tietge, U., and Mock, P., "CO_2 emissions from new passenger cars in the EU: Car manufacturers' performance in 2014," The International Council on Clean Transportation. Retrieved from http://theicct.org/co2-new-cars-eu-manufacturer-performance-2014.

Prepared by: Sonsoles Díaz, Uwe Tietge, Peter Mock

already are around 15% below the 2015 target. Other manufacturer groups still have to make considerable progress to achieve the 2020/21 target on time.

As in 2014, conventional diesel and petrol cars accounted for 96% of new registrations, and diesel cars continued to dominate the market (52% of total sales). The share of hybrid, plug-in hybrid, and battery electric vehicles increased from 2.1% in 2014, to 2.5% in 2015. Alternative powertrains such as liquefied petroleum gas and compressed natural gas vehicles captured the remaining market share (1.5%).

The first stage of the super-credit provision finished in 2015. Super-credits are multipliers that give vehicles with emissions below 50 CO_2 g/km a higher weight in the calculation of manufacturers' average emissions. The super-credit multiplier was 1.5 in 2015, and the impact of super-credits was below 1 g CO_2/km for all manufacturer groups. Super-credits will be reintroduced from 2020 to 2023.

1. BACKGROUND

The European Environment Agency (EEA) recently released a preliminary dataset on the CO_2 emissions performance of new passenger cars in the EU in 2015.[2] This dataset is at the core of the monitoring scheme of CO_2 emissions from passenger cars, and is used by the European Commission to evaluate whether car manufacturers comply with their mandatory CO_2 targets as defined in the Regulation EC 443/2009. The EEA collects the data from the Member States, which are required to submit detailed information on each new car registered on a yearly basis.

The EEA data shows that the sales-weighted average CO_2 emissions from new passenger cars in the EU in 2015 were 119.6 g CO_2/km, around 8% below the target set by the European Commission for the same year and 3% lower than in 2014. The 2015 target has thus been met on average, as anticipated given that average CO_2 emissions from the new EU fleet already dropped below the 130 g CO_2/km mark in 2013.

As illustrated in Figure 1, average CO_2 emissions from new cars decreased by more than 26% from 2005 to 2015. From 2008, when CO_2 targets were first agreed upon, CO_2 emissions fell at an average rate of 3.5% per year. Assuming that average CO_2 emissions from new cars continue to decrease at a similar pace, car manufacturers would meet the 2020/21 target of 95 g CO_2/km, which includes a one-year phase-in.

The reduction of CO_2 emissions implies a reduction in fuel consumption, as they are effectively proportional. Since 2005, fuel consumption has decreased from 7.3 l/100km to 5.1 l/100km (gasoline equivalent) in 2015.[3]

2 European Environment Agency, "Monitoring of CO_2 emissions from passenger cars – Regulation 443/2009." Retrieved from http://www.eea.europa.eu/data-and-maps/data/co2-cars-emission-10.

3 The following factor was used to convert from CO_2 emissions to fuel consumption: 23.4 g CO_2/km per liter gasoline/100 km.

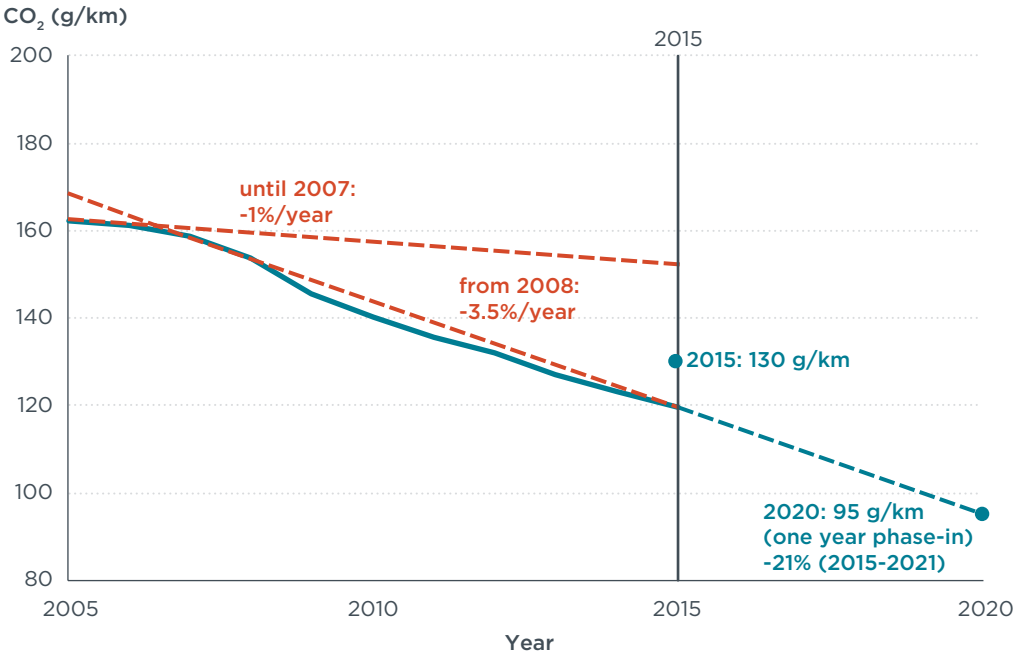

Figure 1: Historical development and targets for CO_2 emission levels of new passenger cars in the EU. Effects of phase-in, super-credits, and eco-innovations are not considered here.

2. CO_2 EMISSIONS BY VEHICLE MANUFACTURER

Car manufacturers are allowed to pool together the average emissions of several brands in order to meet CO_2 standards (only the average CO_2 emissions of a pool as a whole are regulated). In 2015, some brands exceeded their specific limit values, but avoided excess emissions premiums thanks to the pooling provision. This was the case for Porsche (Volkswagen Group) and Jeep (Fiat Chrysler Automobiles), which exceeded their specific targets by around 19% and 7%, respectively. The pools of two smaller manufacturers (Suzuki Pool and Tata Motors) exceeded the 2015 target but were awarded so-called niche derogations,[4] as in previous years.

For the purpose of this analysis, we follow a definition of manufacturer groups that is intended to mirror the actual vehicle market as closely as possible and may be different from manufacturer pools in the context of the EU regulations.[5] All major manufacturer groups met their mandatory CO_2 emission limits in 2015, as Figure 2 illustrates. The 2015 and 2020/21 targets for each manufacturer group are set according to the average mass of their new fleet, based on the limit value curves displayed in the figure. The exact 2020/21 target line equation has not been officially set yet, as it will be adjusted based on the average mass of new passenger cars in the three calendar years leading up to the target year. For the current analysis, the 2020/21 target equation

4 Niche derogations are foreseen for manufacturers with between 10,000 and 300,000 new vehicle registrations annually. In this case, a special target is calculated, corresponding to a 25% reduction relative to the average specific CO_2 emissions of that manufacturer in 2007.

5 Manufacturers are defined here as: PSA (Citroën, Peugeot, DS Automobiles); Toyota (Daihatsu, Lexus, Toyota); Renault-Nissan (Dacia, Lada, Nissan, Renault); Ford (Ford); Fiat (Chrysler, Fiat, Maserati); Volkswagen (Audi, Bentley, Bugatti, Lamborghini, Porsche, Quattro, SEAT, Škoda, Volkswagen); General Motors (Chevrolet, GM, Opel); Daimler (Mercedes-Benz, Smart); and BMW (BMW, Rolls Royce).

was defined using the 2015 average vehicle mass. For each manufacturer group, the 2020/21 target implies a decrease of approximately 27% in average CO_2 emissions compared to the 2015 target.

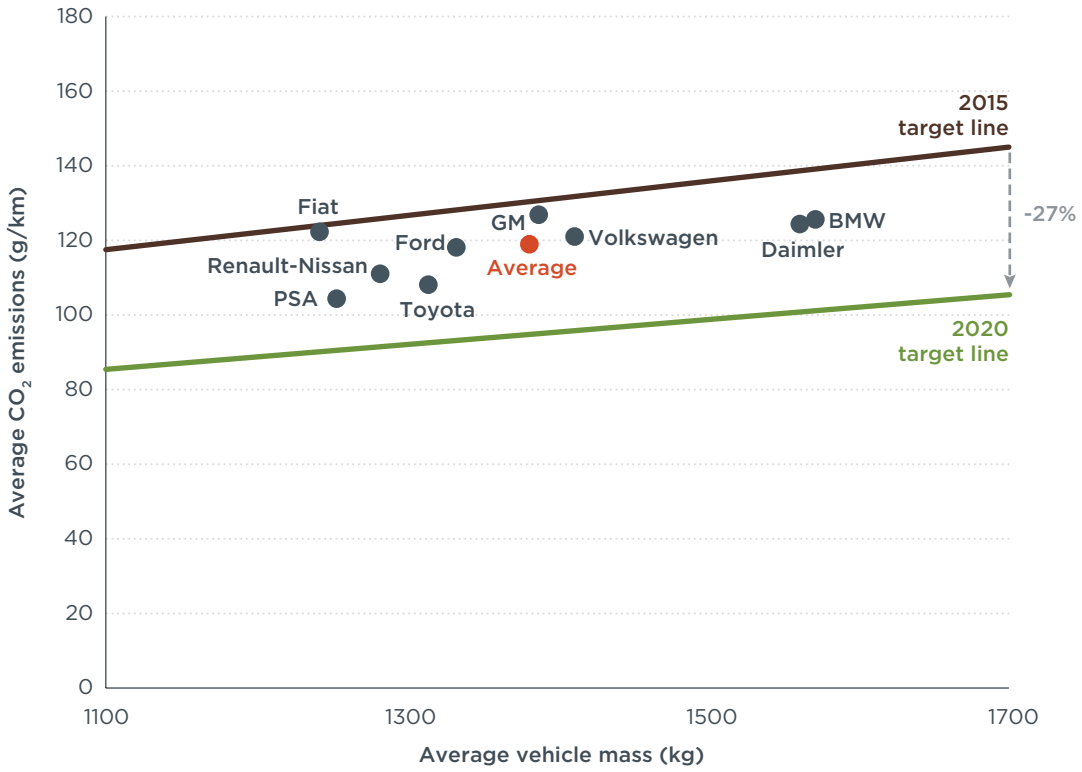

Figure 2: Performance of the top-selling EU passenger car manufacturer groups for 2015, along with the 2015 and 2020 (effectively 2021) target lines.

Table 1 presents average CO_2 emission values for the nine major manufacturer groups, both with and without considering the effect of super-credits. Super-credits are favorable weightings for cars emitting less than 50 g CO_2/km. In 2015, each low-emission passenger car counted as 1.5 cars when calculating the average CO_2 emissions of a manufacturer pool. The impact of super-credits is discussed in detail in Section 4. It should be noted that to illustrate the effect of super-credits, the 2021 multiplier 1.67, slightly higher than the 2015 multiplier 1.5, has been applied in the table.

Table 1 also includes market shares, average vehicle mass, and specific target values for the manufacturer groups. The market average displayed in the table takes into account manufacturer groups with smaller market shares not listed independently in the table.

The nine studied manufacturer groups accounted for 85% of all EU new car registrations in 2015, as Table 1 shows. The effect of super-credits was below 1 g CO_2/km for all of them. CO_2 emission targets differ from one to another by up to 15 g CO_2/km in 2015 as a consequence of the mass-based target system mentioned above.

Table 1: Manufacturer group market shares, average vehicle mass, CO_2 emissions with and without super-credits for 2015, and CO_2 emission targets for 2015 and 2020 (effectively 2021).

	EU market share	Average mass (kg)	CO_2 (g/km)			
			2015 w/o super-credits	2015 w/ super-credits for 2021	2015 target	2020/21 target
PSA	11%	1,253	105	105	125	91
Toyota	4%	1,315	108	108	127	93
Renault-Nissan	14%	1,282	112	111	126	92
Ford	7%	1,332	118	118	128	93
Average		1,381	119	119	130	95
Volkswagen	24%	1,411	121	121	132	96
Fiat	6%	1,242	122	122	124	90
Daimler	6%	1,561	125	124	139	101
BMW	7%	1,571	126	126	139	101
General Motors	7%	1,387	127	127	131	95

Some manufacturer groups are well on their way to reaching the 2020/21 target. For instance, PSA and Toyota are already halfway between the 2015 and the 2020/21 targets. Other manufacturer groups still have to make considerable progress to achieve their 2020/21 targets, especially General Motors and Fiat. The progress towards the 2020/21 target is illustrated in Figure 3 for each manufacturer.

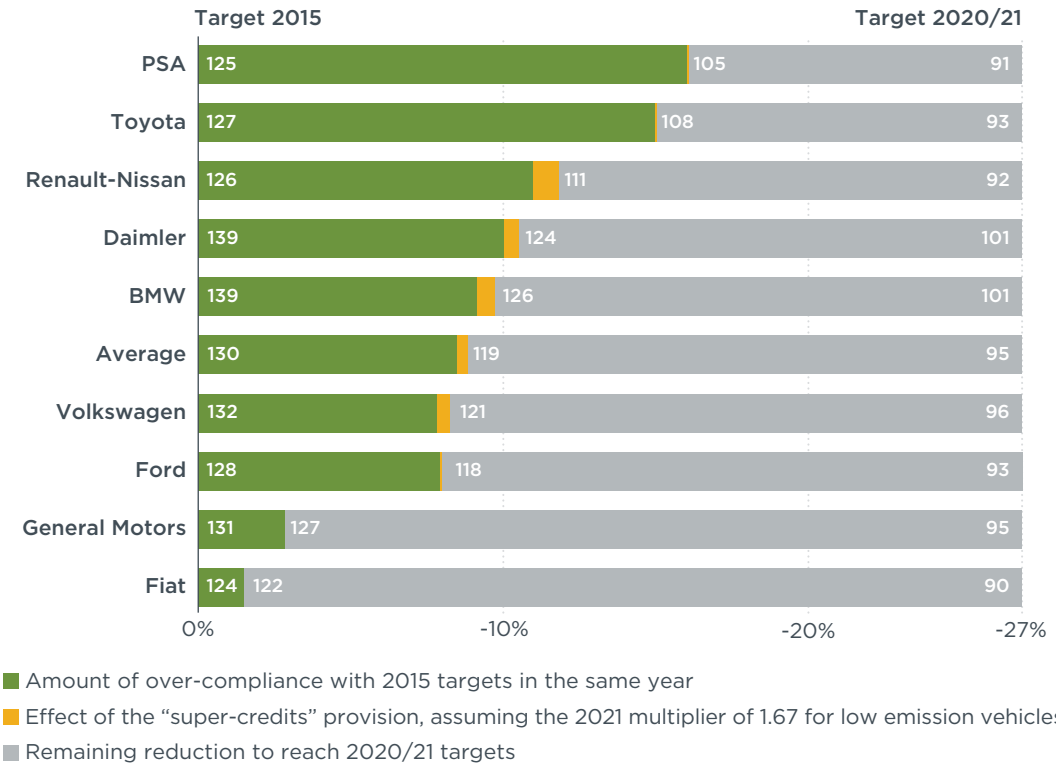

Figure 3: Average CO_2 emissions (in g/km) of key EU passenger car manufacturers in 2015, including 2015 and 2020 (effectively 2021) targets.

3. FUEL/TECHNOLOGY TRENDS BY MEMBER STATE AND MANUFACTURER

Passenger cars powered by alternative fuels made up a small share of the new EU car fleet in 2015. The share of electric vehicles, namely hybrid electric vehicles (HEVs), battery electric vehicles (BEVs) and plug-in hybrid vehicles (PHEVs), increased from 2.1% in 2014 to 2.5%. As in the previous year, conventional diesel and petrol cars accounted for 96% of new cars. With a market share of 52%, diesel cars continued to dominate new registrations, but lost a percentage point compared to 2014.

Table 3 presents the market share of various fuels and technologies in 2015 by country.[6] Alternative fuel types such as hydrogen, compressed natural gas (CNG), ethanol-gasoline mix, and liquefied petroleum gas (LPG) have been grouped as "Other."

Table 2: Market share of fuels/technologies for new passenger cars in 2015, by country.

	Diesel	Petrol	Hybrid-electric	Battery-electric	Plug-in hybrid electric	Other	EU Market share
EU Total	52%	44%	1.5%	0.5%	0.6%	1.5%	
Germany	48%	50%	0.6%	0.4%	0.3%	0.3%	23.4%
UK	48%	49%	1.7%	0.4%	0.6%	0.0%	19.2%
France	57%	39%	2.2%	0.9%	0.2%	0.1%	13.8%
Italy	56%	31%	1.6%	0.1%	0.0%	11.3%	11.6%
Spain	63%	35%	1.8%	0.1%	0.1%	0.0%	7.5%
Others (EU)	42%	55%	1.0%	0.1%	0.0%	0.8%	7.4%
Belgium	60%	38%	1.5%	0.3%	0.3%	0.1%	3.7%
Netherlands	29%	58%	3.3%	0.9%	8.8%	0.2%	3.3%
Sweden	58%	35%	2.5%	0.9%	1.6%	1.9%	2.5%
Austria	58%	40%	0.7%	0.6%	0.3%	0.2%	2.3%
Denmark	31%	66%	1.1%	2.2%	0.1%	0.0%	1.5%
Portugal	68%	29%	1.7%	0.4%	0.3%	0.4%	1.3%
Ireland	71%	27%	1.2%	0.4%	0.1%	0.1%	0.9%
Finland	36%	61%	2.6%	0.2%	0.4%	0.3%	0.8%
Greece	63%	35%	1.1%	0.1%	0.0%	0.3%	0.6%
Luxembourg	71%	28%	0.8%	0.2%	0.2%	0.0%	0.3%
Norway	41%	30%	7.1%	17.1%	5.3%	0.0%	—
Switzerland	39%	57%	1.8%	1.2%	0.7%	0.3%	—

Figure 4 shows the market share of HEVs, BEVs, and PHEVs, along with the change in these shares from 2014 to 2015 in percentage points. Norway is at the forefront of the European electric vehicle market, as Figure 4 shows. The country has a growing share of electric vehicles and the highest absolute number of registrations of BEVs in Europe

6 Because the EEA data does not include details on plug-in hybrid electric vehicles, EEA data has been supplemented with commercial data obtained from IHS-Polk.

due to a wide array of tax incentives.[7] In 2015, BEV shares also surged in Denmark, where they were exempt from the registration tax until the end of the year.[8]

The plug-in hybrid electric vehicle (PHEV) market has experienced the steepest growth amongst electric powertrains across European countries, from an average share of 0.2% in 2014, to 0.6% in 2015. This is especially the case in the Netherlands, which is the country with the highest share of PHEVs (8.8%).

Italy stands out with an 11% share of LPG and CNG cars, the highest in the EU.

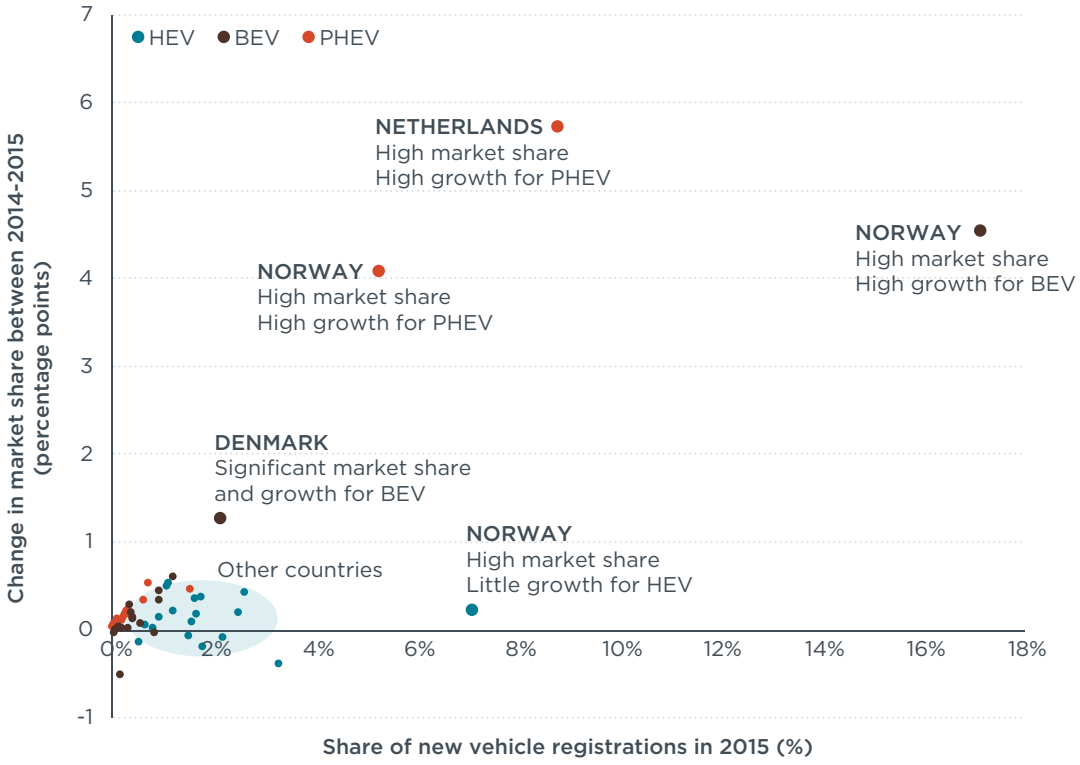

Figure 4: New hybrid, plug-in hybrid, and battery electric passenger car market shares in Europe in 2015 and change in market share between 2014 and 2015.

Similar to Table 2, Table 3 presents the market share of fuels/technologies in 2015 for major car manufacturer groups sorted by descending market shares.

Toyota clearly stands out with the highest share of HEVs (31.3% of sales), followed by Daimler as a distant second with 1.0%. As in 2014, Renault-Nissan and BMW led the BEV market. BEVs accounted for 1.6% and 1.0% of their 2015 sales, respectively. As for the PHEV market, Volkswagen and Daimler moved ahead of the previous leaders (BMW and Toyota) with PHEV shares of 1.0% and 0.8%, respectively. The Italian automaker Fiat led the market for natural gas vehicles, which made up 9.6 % of total sales, followed by General Motors with 2.8%.

7 Tietge, U., et al., "Comparison of leading electric vehicle policy and deployment in Europe", The International Council on Clean Transportation. Retrieved from http://theicct.org/comparison-ev-policies-europe-2016.

8 European Automobile Manufacturers Association, "ACEA Tax Guide 2015." Retrieved from http://www.acea.be/publications/article/acea-tax-guide.

Table 3: Market share of fuel/technologies in 2015 by selected manufacturers.

	Diesel	Petrol	Hybrid-electric	Battery-electric	Plug-in hybrid electric	Other	EU market share
Average EU	52%	44%	1.5%	0.5%	0.6%	1.5%	
Volkswagen	55%	42%	0.1%	0.1%	1.0%	1.1%	24.7%
Renault-Nissan	53%	44%	0.0%	1.6%	0.0%	1.8%	13.6%
PSA	58%	41%	0.4%	0.1%	0.0%	0.2%	10.4%
Ford	45%	53%	0.1%	0.0%	0.1%	1.6%	7.4%
General Motors	35%	62%	0.0%	0.0%	0.0%	2.8%	6.8%
BMW	70%	29%	0.0%	1.0%	0.5%	0.0%	6.5%
Daimler	64%	33%	1.0%	0.4%	0.8%	0.2%	5.9%
Fiat	39%	52%	0.0%	0.0%	0.0%	9.6%	5.8%
Toyota	21%	47%	31.3%	0.0%	0.1%	0.0%	4.2%

Table 4 presents fuel/technology shares for individual manufacturers. Toyota's hybrid electric vehicle (HEV) sales increased by 3 percentage points compared to 2014, and made up 26.9% of the brand's total sales. In addition, Lexus, the luxury division of Toyota, almost exclusively sold HEVs in the European market.

PHEVs accounted for over 22% of Mitsubishi's total sales, as the Mitsubishi Outlander PHEV continued to sell well in the UK and the Netherlands, and was again the best-selling plug-in hybrid electric model in the EU. Porsche and Volvo also sold a considerable share of PHEVs (5.0% and 3.4% respectively). VW's PHEV share increased notably from 0.1% to 1.2%, which mainly is attributed to the high sales of the models Golf GTE and Passat GTE in the Netherlands. The PHEV Audi A3 e-tron was also among the best-selling plug-in hybrid electric models in the EU, due to its popularity in the Dutch market. PHEVs accounted for 1.3% of Audi's total sales.

While the average share of HEVs and PHEVs increased from 2014 to 2015, the average share of BEVs remained at 0.5%. Nevertheless, the models Nissan Leaf and Renault Zoe accounted for a notable share of their respective brands' total sales, 2.2% and 1.7%. Both models sold particularly well in France and the United Kingdom. The BEV Tesla Model S was third in terms of BEV registrations, after the Zoe and the Leaf, as it was the preferred battery electric model in Denmark. In the fourth place, the BMW i3 BEV model made up 1.2% of the brand's total sales.

Table 4: Market share of fuel/technologies for new passenger cars in 2015 for selected brands.

	Diesel	Petrol	Hybrid-electric	Battery-electric	Plug-in hybrid electric	Other	EU market share
Average EU	52%	44%	1.5%	0.5%	0.6%	1.5%	
VW	55%	42%	0.0%	0.2%	1.2%	1.5%	12.1%
Ford	45%	53%	0.1%	0.0%	0.1%	1.6%	7.4%
Renault	57%	41%	0.0%	1.7%	0.0%	0.7%	6.9%
Peugeot	59%	40%	0.6%	0.1%	0.0%	0.3%	6.0%
Audi	72%	27%	0.0%	0.0%	1.3%	0.4%	5.4%
BMW	78%	20%	0.0%	1.2%	0.6%	0.0%	5.2%
Mercedes	72%	25%	1.2%	0.2%	0.9%	0.2%	5.2%
Opel	37%	59%	0.0%	0.0%	0.0%	3.9%	4.8%
Fiat	35%	56%	0.0%	0.0%	0.0%	9.4%	4.7%
Citroën	58%	42%	0.2%	0.1%	0.0%	0.1%	4.4%
Škoda	46%	53%	0.0%	0.0%	0.0%	1.1%	4.3%
Nissan	49%	48%	0.0%	2.4%	0.0%	0.8%	3.9%
Toyota	23%	50%	26.9%	0.0%	0.2%	0.0%	3.9%
Hyundai	42%	57%	0.0%	0.0%	0.0%	1.0%	3.3%
Kia	46%	51%	0.1%	1.3%	0.0%	1.2%	2.8%
Dacia	49%	46%	0.0%	0.0%	0.0%	5.9%	2.7%
SEAT	42%	57%	0.0%	0.0%	0.0%	1.2%	2.4%
Vauxhall	31%	69%	0.0%	0.0%	0.0%	0.0%	2.0%
Volvo	88%	8%	0.0%	0.0%	3.4%	0.2%	2.0%
Mini	39%	61%	0.0%	0.0%	0.0%	0.0%	1.3%
Honda	42%	56%	1.4%	0.0%	0.0%	0.0%	0.9%
Mitsubishi	30%	46%	0.0%	0.2%	22.7%	0.4%	0.9%
Smart	0%	98%	0.0%	2.0%	0.0%	0.0%	0.7%
Porsche	45%	48%	2.3%	0.0%	5.0%	0.0%	0.5%
Lexus	0%	6%	94.5%	0.0%	0.0%	0.0%	0.3%

4. SUPER-CREDITS

Super-credits were introduced to incentivize car manufacturers to produce low-carbon vehicles, such as PHEVs and BEVs. According to the super-credit provision, vehicles with low CO_2 emissions, below 50 g CO_2/km, are assigned an increased weight when calculating manufacturer's average emissions.

During the first stage of super-credits, from 2013 to 2015, the following weighting factors applied: each low-emitting car counted as 3.5 cars in 2013, 2.5 in 2014, 1.5 in 2015, and 1 starting in 2016. The second stage is planned for 2020 to 2023, although the weighting factors will be lower than in the first period. For this second phase, the following multipliers will be used: each low-emitting car will count as 2 cars in 2020, 1.67 in 2021, 1.33 in 2022, and 1 starting in 2023. There will be a cap on super-credits' contribution to CO_2 reductions of 7.5 g CO_2/km per manufacturer over the entire period.

The number of vehicles that qualify for the super-credits doubled from 2014 to 2015. In spite of this increase, the effect of super-credits on average CO_2 emissions of car manufacturers was rather limited due to the lower weighting factor in 2015. Table 5 presents the effect of super-credits on average CO_2 emissions of both manufacturer groups and a selection of their associated brands in 2014 and 2015. Seven further brands which do not belong to the major manufacturer groups have been included in the table.

Table 5: Effect of super-credits on CO_2 emissions by manufacturer group and brand. Super-credits multiplier was 2.5 in 2014 and 1.5 in 2015.

	2014 Avg. CO_2 emissions (g/km)			2015 Avg. CO_2 emissions (g/km)			Reduction since 2014	
	w/o super-credits	w/ super-credits	Difference	w/o super-credits	w/ super-credits	Difference	w/o super-credits	w/ super-credits
PSA	110.1	110	0.1	104.6	104.5	0.1	5%	5%
Peugeot	109.6	109.5	0.1	103.7	103.7	0.0	5%	5%
Citroën	110.8	110.7	0.1	105.9	105.8	0.0	4%	4%
Toyota Group	112.8	112.6	0.2	108.3	108.3	0.0	4%	4%
Toyota	112.8	112.6	0.2	107.9	107.8	0.0	4%	4%
Lexus	112.9	112.9	0	115.5	115.5	0.0	-2%	-2%
Renault-Nissan	113.9	111.9	2.1	112.1	111.3	0.9	2%	1%
Renault	108.4	106.5	1.9	106.2	105.3	0.9	2%	1%
Nissan	115	111.3	3.8	114.6	113.3	1.3	0%	-2%
Dacia	125.4	125.4	0	123.4	123.4	0.0	2%	2%
Ford Group	121.7	121.7	0	118.0	118.0	0.0	3%	3%
Ford	121.7	121.7	0	118.0	118.0	0.0	3%	3%
Fiat Group	121.5	121.4	0.1	122.2	122.2	0.0	-1%	-1%
Fiat	117.9	117.8	0.1	118.1	118.1	0.0	0%	0%
Volkswagen	125.8	125.5	0.3	121.5	121.0	0.4	3%	4%
SEAT	117.3	117.3	0	116.7	116.7	0.0	0%	0%
Škoda	121	121	0	115.6	115.6	0.0	4%	4%
VW	123.9	123.3	0.5	118.9	118.3	0.6	4%	4%
Audi	131.4	131.2	0.2	128.2	127.6	0.6	2%	3%
Porsche	192.6	192.6	0.1	183.8	183.8	0.0	5%	5%
General Motors	130.5	130.4	0.1	127.0	126.9	0.0	3%	3%
Opel	129.5	129.4	0.1	126.3	126.3	0.0	2%	2%
Vauxhall	131.7	131.5	0.2	128.0	128.0	0.0	3%	3%
BMW Group	131.6	129.9	1.7	126.4	125.7	0.6	4%	3%
BMW	133.5	131.4	2.1	128.3	127.5	0.8	4%	3%
Daimler	131.5	130.6	0.9	124.7	124.3	0.5	5%	5%
Smart	94.6	87.4	7.2	94.1	93.2	0.9	0%	-7%
Mercedes-Benz	134.4	134.4	0.1	128.7	128.3	0.4	4%	5%
Other brands								
Mitsubishi	114.6	98.3	16.3	110.0	103.0	7.0	4%	-5%
Mini	123	123	0	117.9	117.9	0.0	4%	4%
Volvo	125.4	122.3	3.1	121.9	120.7	1.1	3%	1%
Hyundai	130.1	130.1	0	127.3	127.3	0.0	2%	2%
Kia	130.9	130.8	0.1	128.0	127.2	0.8	2%	3%
Honda	133.9	133.8	0	131.3	131.3	0.0	2%	2%

At the group level, the provision translated into a maximum reduction of 0.9 g CO_2/km for Renault-Nissan due to the group's comparatively high share of battery electric vehicles. At the brand level, the effect of super-credits was most notable for Mitsubishi, with a reduction of 7 g CO_2/km in the average emissions of the brand. The reduction is due to the high sales of the plug-in model Outlander PHEV. Super-credits also had a significant impact on Nissan's and Volvo's average CO_2 emissions. In the case of Nissan, the impact is attributed to the BEV model Leaf, which made up 2.2% of the brand's total EU sales. As for Volvo, the impact is due to the V60 PHEV, which was 2.3% of Volvo's EU sales. For the other brands, the difference between average emissions with and without super-credits was lower than 1 g CO_2/km.

5. INTERNATIONAL CONTEXT

In the international context, the EU has historically been a front-runner with respect to vehicle emission targets. In recent years, however, most large economies have set converging CO_2 emissions targets for new vehicles (Figure 5). Compared to the EU's 2020/21 target of 95 g CO_2/km, the US (97 g CO_2/km for 2025 passenger cars), South Korea (97 g CO_2/km by 2020), and Canada (97 g CO_2/km by 2025) have set similar targets. China's 2025 proposed target (93 g CO_2/km) exceeds the EU 2020/21 target.

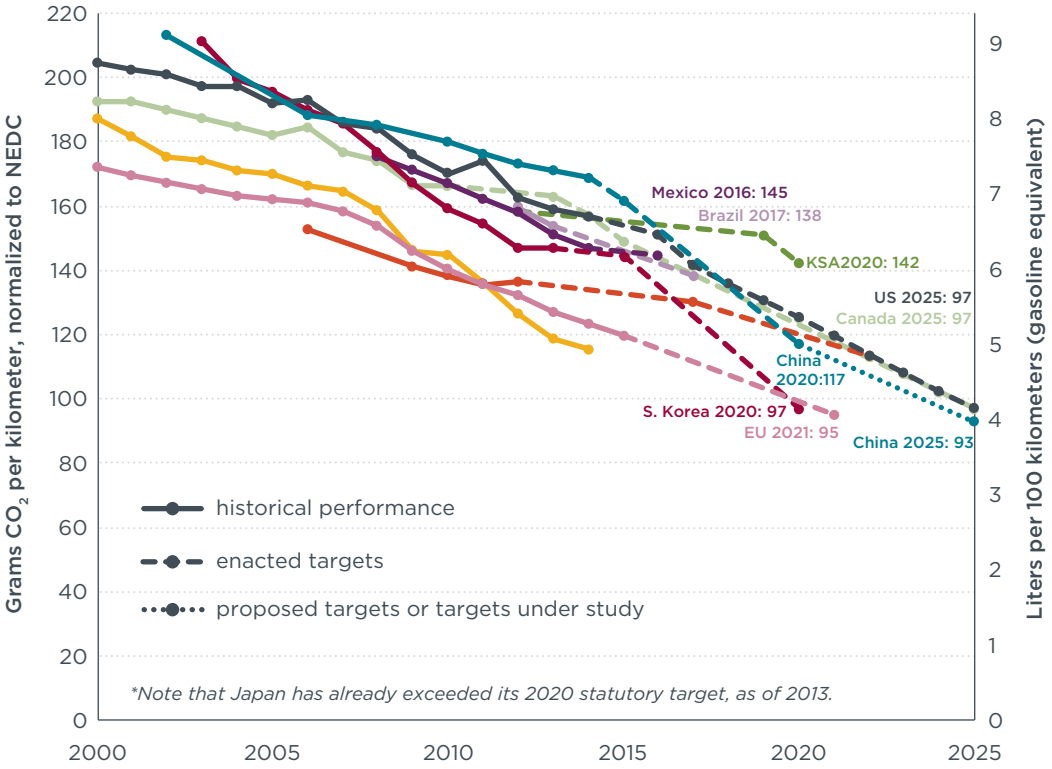

Figure 5: Comparison of global CO_2 regulations for new passenger cars.[9]

9 China's target reflects gasoline vehicles only. U.S. CO_2 emission values are derived from fuel economy standards set by NHTSA, reflecting tailpipe GHG emission (i.e., they exclude low-GWP refrigerant credits incorporated in the U.S. EPA GHG regulation). Gasoline in Brazil contains 22% ethanol (E22); all data in the chart has been converted to the gasoline (E00) equivalent. Supporting data can be found at www.theicct.org/info-tools/global-passenger-vehicle-standards.

6. OUTLOOK

It should be noted that the EEA dataset has yet to be validated. The final dataset will be published at the end of 2016, so the specific numbers in this report may change.[10] The preliminary data for 2015 should, however, provide relatively reliable results, although emissions under real-world conditions are significantly higher. The gap between official and real-world CO_2 emission values of European cars has been widening over time and reached approximately 40% in 2014, indicating that the values presented in this briefing significantly underestimate on-road emissions and fuel consumption.[11] The ICCT will follow up on European emissions data in the forthcoming European Vehicle Market Statistics Pocketbook 2016/2017.[12]

10 Historically the difference between preliminary and final data has been low. In 2014, there was a less than 0.01% difference in the preliminary and final data for average CO_2 emissions.

11 Tietge, U., et al., "From laboratory to road – A 2015 update of official and "real-world" fuel consumption and CO_2 values for passenger cars in Europe", The International Council on Clean Transportation. Retrieved from http://www.theicct.org/sites/default/files/publications/ICCT_LaboratoryToRoad_2015_Report_English.pdf.

12 See http://www.theicct.org/european-vehicle-market-statistics-2015-2016 for the 2015/2016 edition.