Overview of the Fuel Economy Standard and its Policy Option

Dr. Axel Friedrich

Germany

International Council on Clean Transportation

The goal of the ICCT is to dramatically reduce conventional pollutant and greenhouse gas emissions from personal, public and goods transportation in order to improve air quality and human health, and mitigate climate change.

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http://www.theicct.org/

GHG Reduction in the Transport Sector

- **Traffic avoidance**, e.g. by traffic avoidance spatial regional planning, regional economical circuits etc.
- **Modal shift to more environmental friendly modes as walking, cycling, bus or rail**
- **More efficient vehicles and propulsion by introduction of** CO_2- limits and –in the long term – alternative fuels
- **Financial measures**, e.g. dismantling of traffic inducing subsidies, adaption of the annual vehicles tax, HDV road fee, energy taxes, taxation of aviation
- **Influencing of the purchase behavior of vehicles by labeling and driving behavior by driver training and speed limits**.

EU CO_2 Regulation

EU Regulation for the Limitation of CO_2 Emissions from Cars (1)

The EU regulation **(EC) No 443/2009** strives to reduce the average CO2 emissions from new cars registered in the EU. The limit is 130 g/kmCO2 by 2015 (approx. 5.6 litres per 100 km for petrol cars and 5.0 litres for diesel cars). That is 18% below the average in 2007, which stood at 158 g/km. The target of 130 g CO2/km is phased-in from 2012 to 2015 where only 65% of the new fleet should comply with the target in 2012, 75% in 2013, 80% in 2014, and 100% as of 2015.

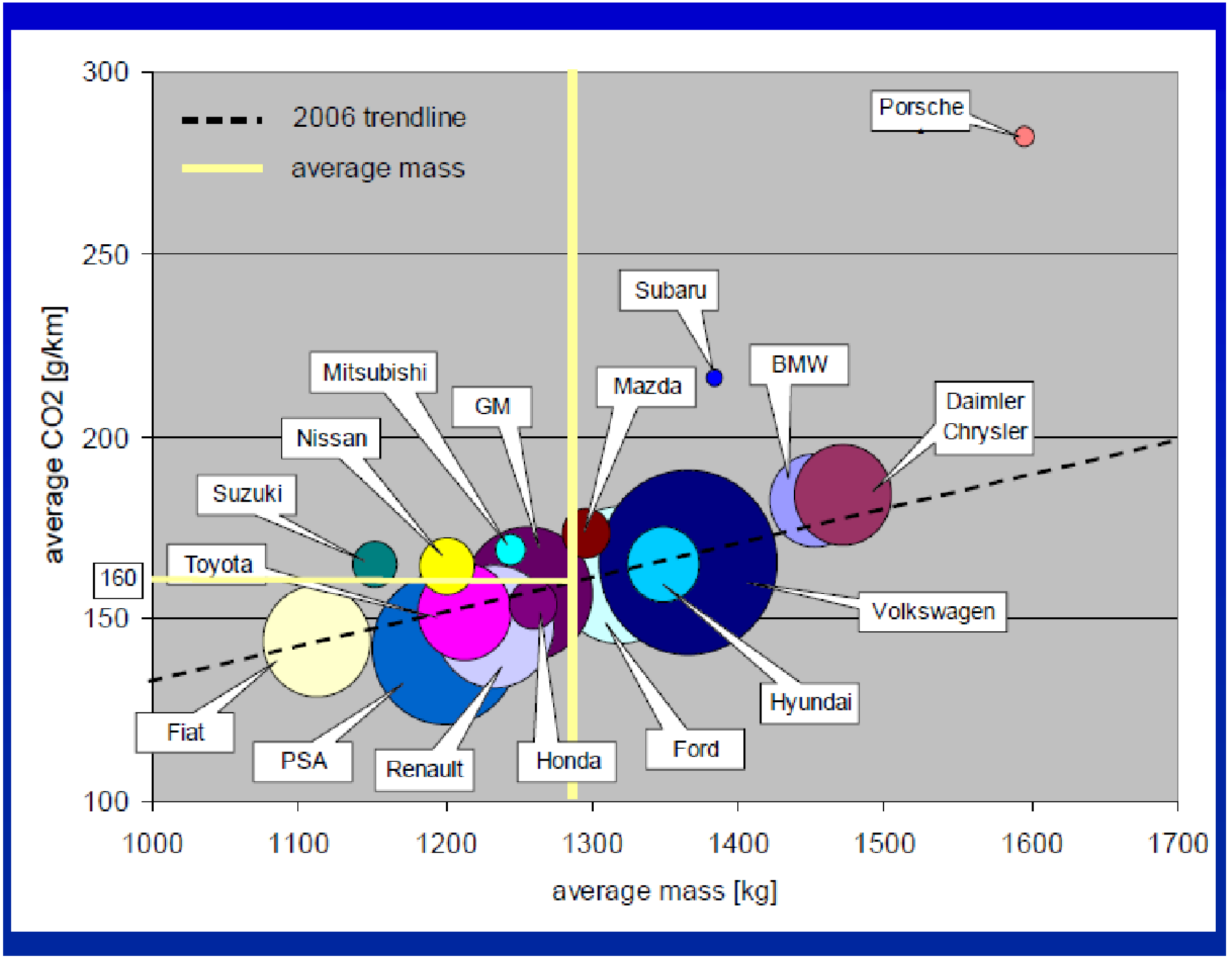
EU Regulation for the Limitation of CO_2 Emissions from Cars (2)

The company target is an average for all cars sold.

Manufacturers can average the CO2 emissions from all cars they sell.

Individual manufacturers' targets will be differentiated on the basis of the weight of the cars they produce in the target year. For example, if a manufacturer's cars are 100 kg heavier than the industry average, they are allowed a 4.6 g/km higher CO2 target. Conversely, if their cars are lighter than average they get a tougher target.

Start Situation in the EU



Av. CO_2 Emissions from new Cars in the EU by Association

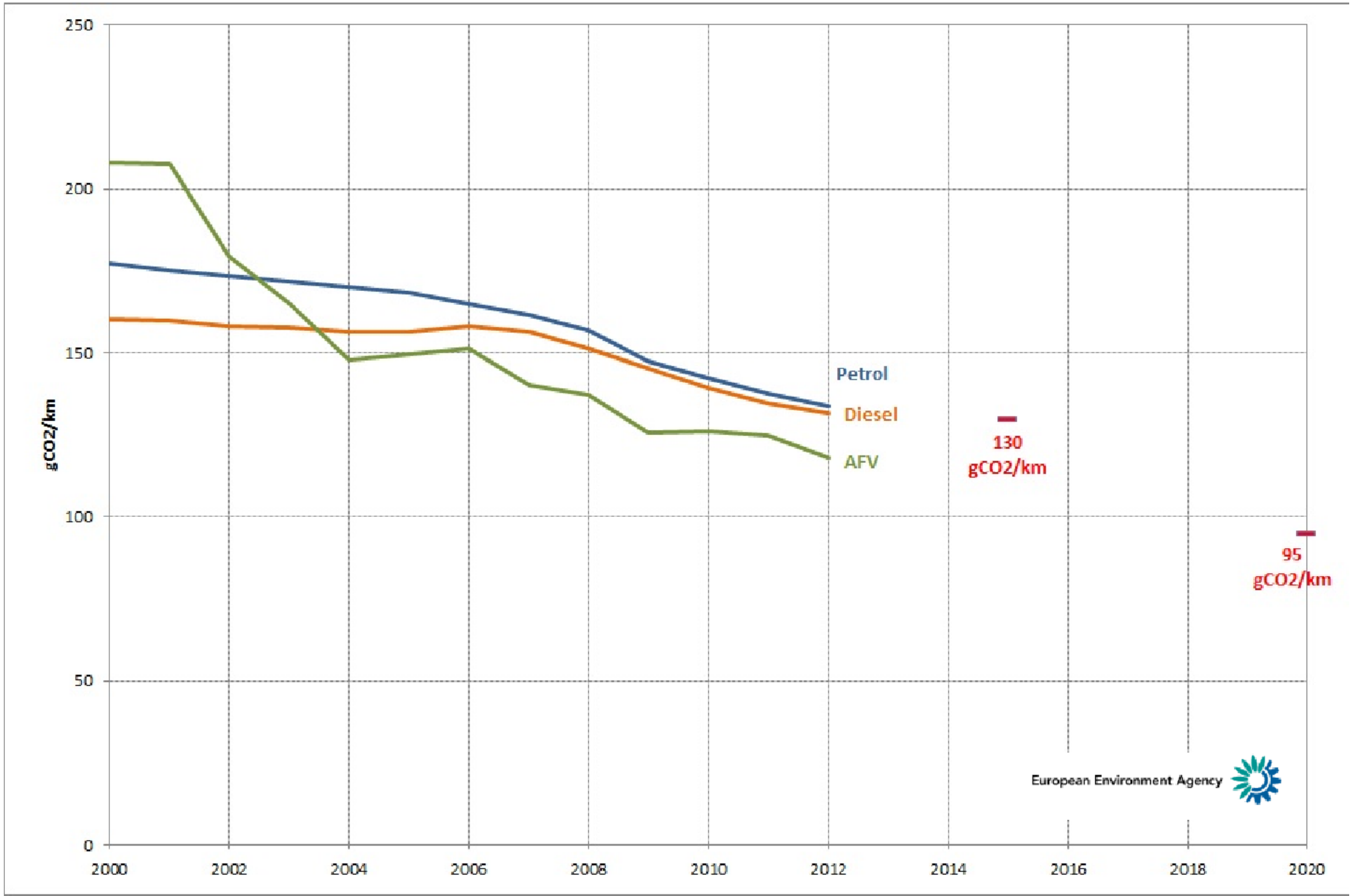
gCO_2/km	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
ACEA	169.2	167.0	164.4	162.5	160.7	160.0	159.7	157.0	152.3	145.1
JAMA	179.6	176.6	173.7	172.0	169.7	166.2	161.4	159.5	153.7	142.6
KAMA	184.2	185.5	183.5	178.7	167.5	166.6	164.3	161.1	151.5	141.8

Based on the latest monitoring data[7], it is now clear that the 2008 target for ACEA was not achieved. On the other hand JAMA and KAMA achieved significant reductions in CO_2 emissions during this period and were very close to reaching their 2009 target. The financial and economic crisis contributed to the observed decreases in 2009 due to a change of consumer behaviour.

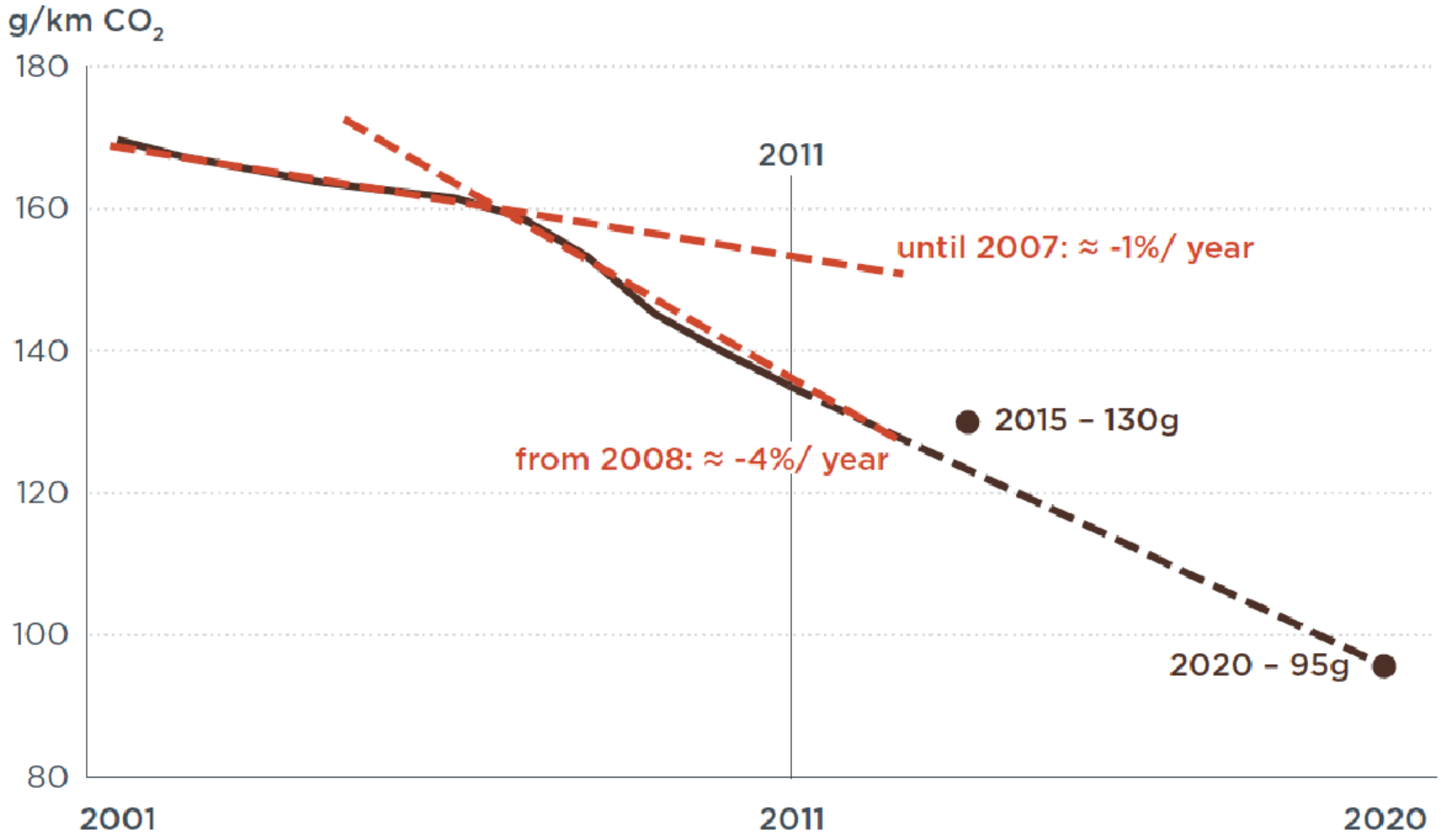
Av. CO_2 Emissions from new Cars in the EU

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
gCO_2/km	172.2	169.7	167.2	165.5	163.4	162.4	161.3	158.7	153.6	145.7

CO_2 Emissions from new Cars in the EU



EU CO_2 regulation shows effect: 2015 target will be reached ahead of time



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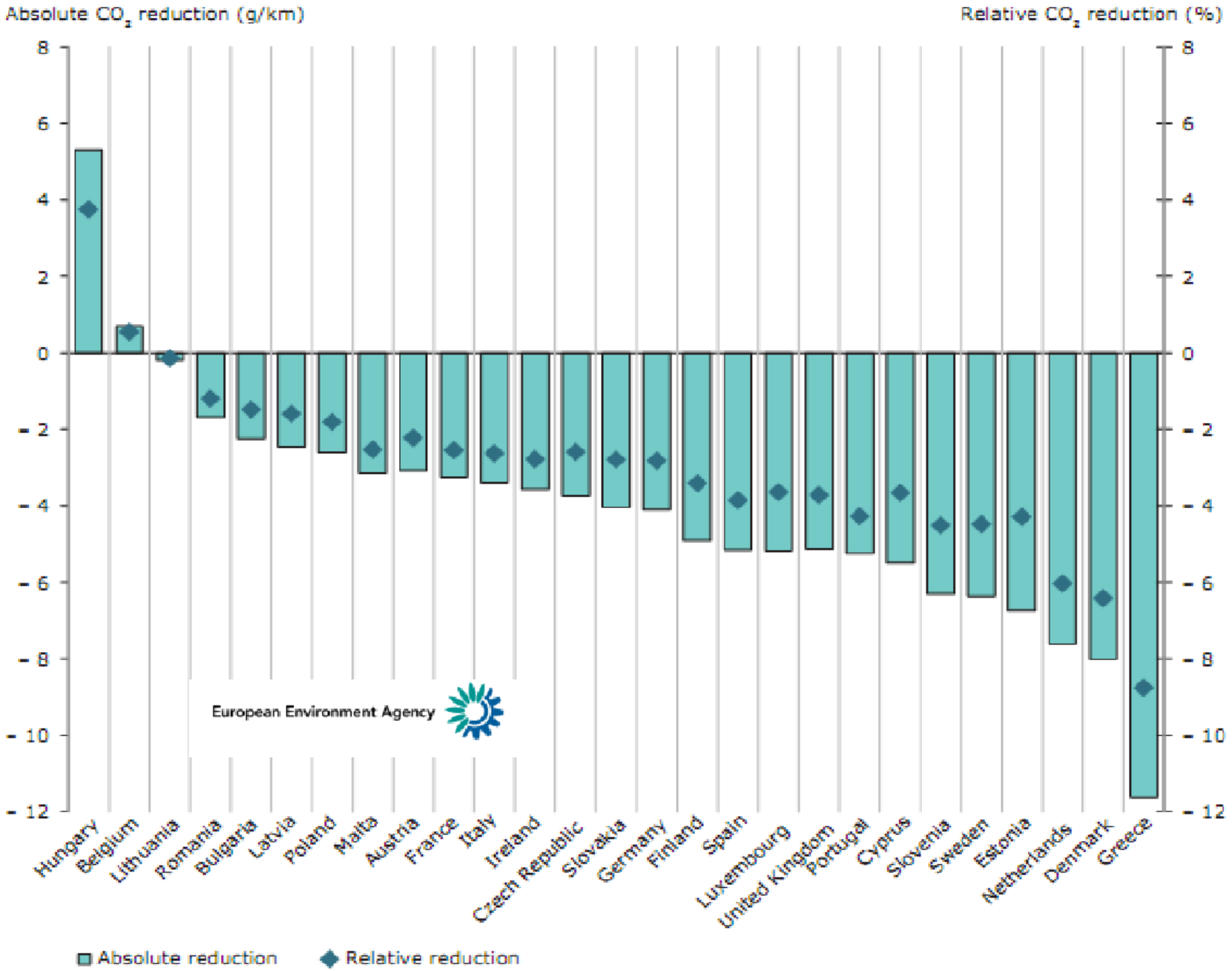
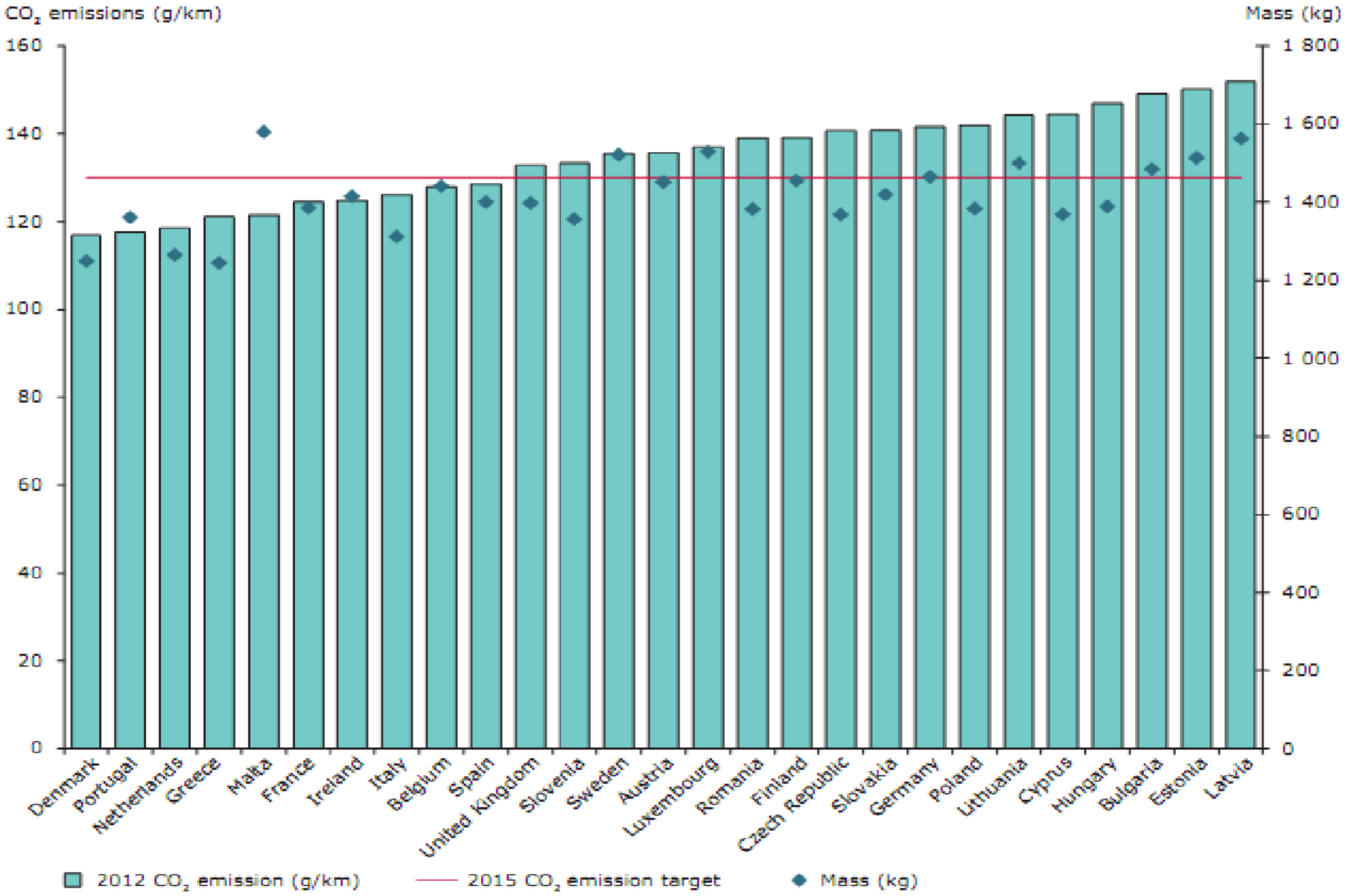
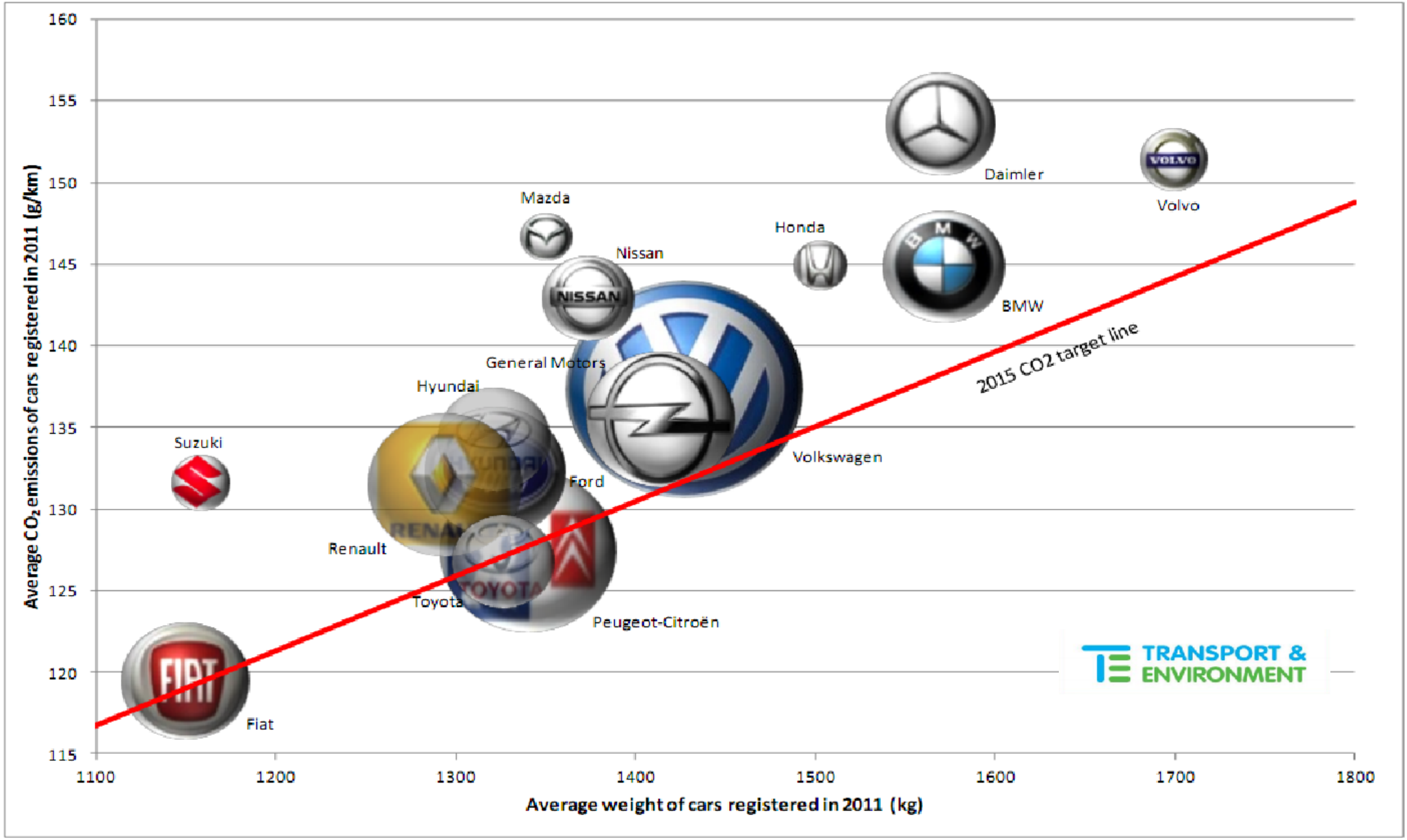
Absolute reduction (bar) and the percentage reduction (diamond) by Member State between 2011 and 2012



Average CO2 Emission and average Mass by EU Member States — 2012



Fleet-average Weight and Fleet-average CO_2 Emissions by Car maker, compared with EU Target Line

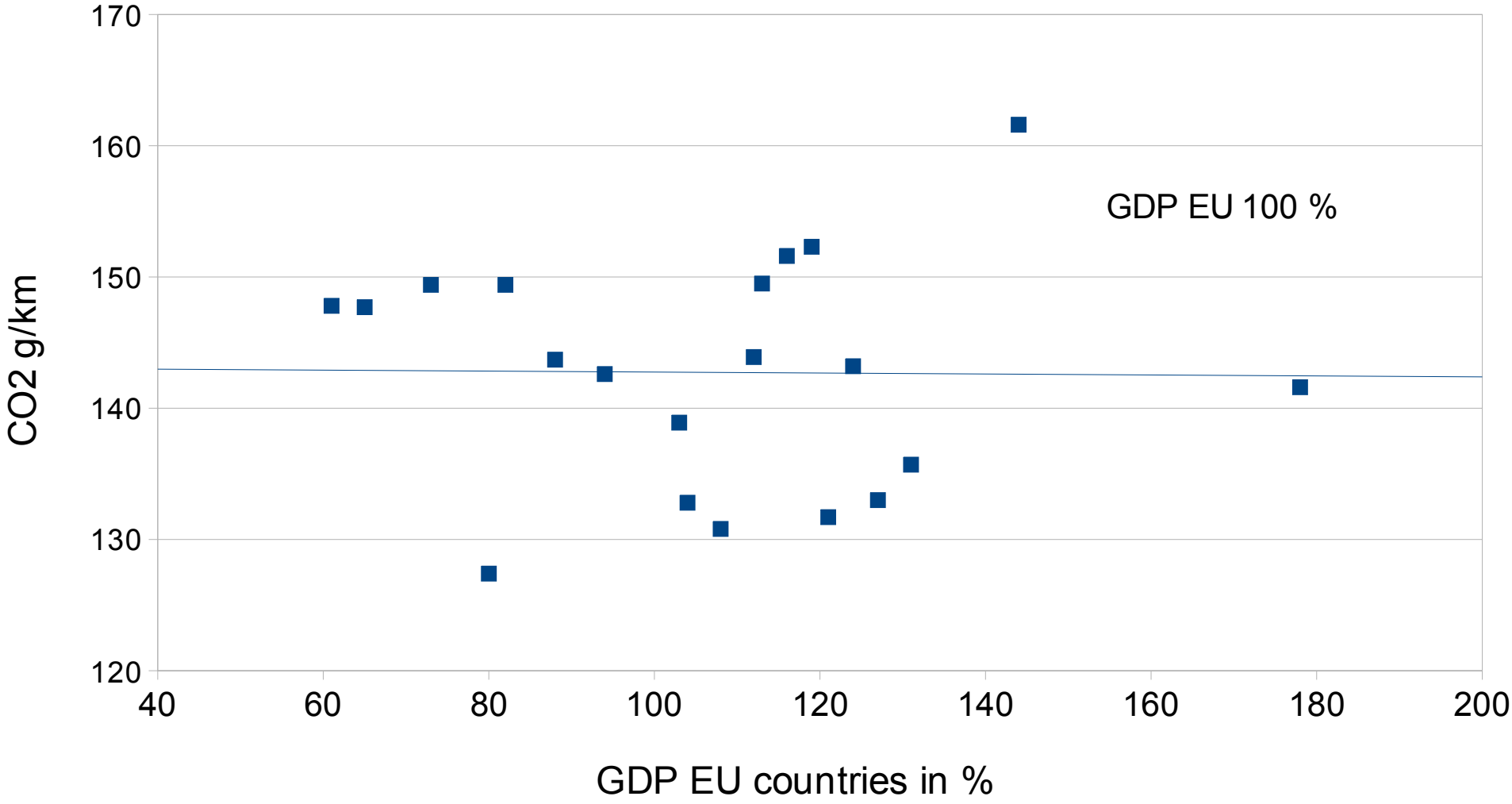


Percentage Reduction in CO2 each Carmaker now has to make to hit its 2015 EU CO_2 Target

	Ranking	2011 Performance	Target 2015	Reduction Required
1	Peugeot-Citroën	127.4	127.8	-0.3%
2	Toyota	126.8	127.2	-0.3%
3	Fiat	119.4	119.1	0.3%
4	General Motors	135.4	131.2	3.2%
5	Ford	132.2	127.0	4.0%
6	Volkswagen	137.3	131.8	4.0%
7	Renault	131.4	125.7	4.4%
8	BMW	144.8	138.4	4.4%
9	Volvo	151.4	144.2	4.7%
10	Hyundai	134.2	126.9	5.5%
11	Honda	144.9	135.2	6.6%
12	Suzuki	131.6	119.5	9.2%
13	Nissan	142.9	129.3	9.5%
14	Daimler	153.5	138.3	9.9%
15	Mazda	146.6	128.3	12.5%
	Average	135.8	130.0	4.3%

TRANSPORT & ENVIRONMENT

Av. CO_2 Emissions of New Cars in the EU in Relation to GDP



EU CO_2 Car Label

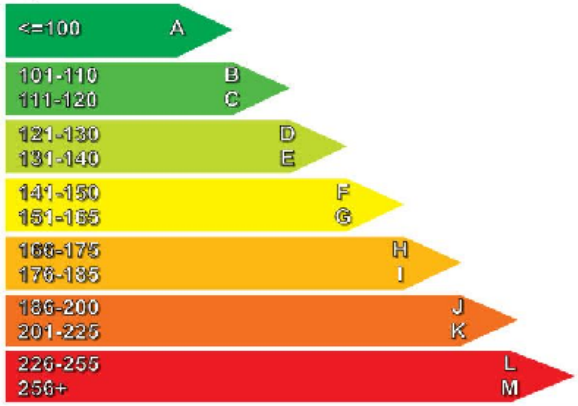
To help drivers choose new cars with low fuel consumption, EU Member States are required to ensure that relevant information is provided to consumers, including a label showing a car's fuel efficiency and CO2 emissions.

Specifically, the EU legislation requires:
A label showing fuel economy and CO2 emissions to be attached to all new cars or displayed nearby at the point of sale;
A poster or display to be exhibited showing prominently the official fuel consumption and CO2 emissions data of all new car models displayed or offered for sale or lease at or through the respective point of sale;
A guide on fuel economy and CO2 emissions from new cars to be produced in consultation with manufacturers at least annually. The guide should be available free of charge at the point of sale and from a designated body within each Member State;
All promotional literature to contain the official fuel consumption and specific CO2 emissions data for the passenger car model to which it refers.
Annexes to the directive set out minimum requirements that each of these consumer information items must meet.

Fuel Economy

VED band and CO_2

CO_2 emission figure (g/km)



B g/km

Fuel cost (estimated) for 12,000 miles

A fuel cost figure indicates to the consumer a guide fuel price for comparison purposes. This figure is calculated by using the combined drive cycle (town centre and motorway) and average fuel price. Recalculated annually, the current cost per litre as at March 2009 is as follows: petrol 88p, diesel 100p and LPG 51p (VCA March 2009).

VED for 12 months

Vehicle excise duty (VED) or road tax varies according to the CO_2 emissions and fuel type of the vehicle.

Environmental Information

A guide on fuel economy and CO_2 emissions which contains data for all new passenger car models is available at any point of sale free of charge. In addition to the fuel efficiency of a car, driving behaviour as well as other non-technical factors play a role in determining a car's fuel consumption and CO_2 emissions. CO_2 is the main greenhouse gas responsible for global warming.

Make/Model:	Engine Capacity (cc):
Fuel Type:	Transmission:

Fuel Consumption:

Drive cycle	Litres/100km	Mpg
Urban		
Extra-urban		
Combined		

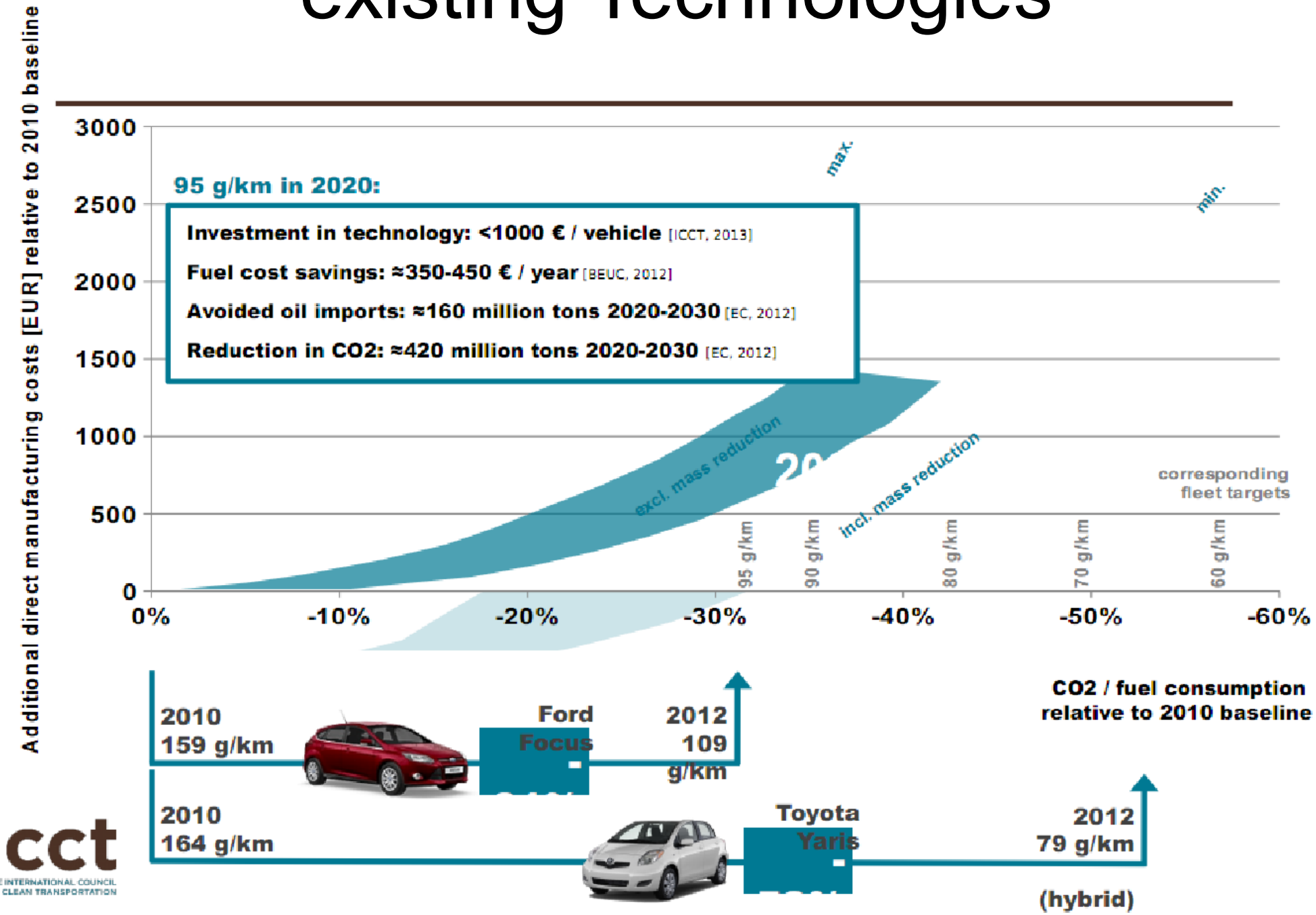
Carbon dioxide emissions (g/km):
Important note: Some specifications of this make/model may have lower CO_2 emissions than this. Check with your dealer.

Department for Transport

To compare fuel costs and CO_2 emissions of new cars, visit www.vcacarfueldata.org.uk

VCA

Economical Saving Potential with existing Technologies



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Progress

EU Car CO2 Emission Limits Unrealistic Says Industry

The European Automobile Manufacturers' Association (ACEA) has criticized the European Commission's new limits on carbon dioxide emissions from cars as prohibitively expensive and unrealistic. The EU's executive Commission proposed carmakers be required to reduce carbon dioxide (CO2) emissions from new cars sold in Europe to an average 130 grams per kilometer by 2012. But Sergio Marchionne, chief executive of Italian car maker Fiat and head of the ACEA, told a business seminar: "It is prohibitively expensive to achieve a target of 130 grams per km through vehicle technology only. It is unrealistic that this can be done by 2012. The announced legislative framework will not be ready before 2009. This leaves the industry too little time to apply it by 2012. The cars of 2012 are being designed today," he said.

ACEA represents manufacturers including BMW, DaimlerChrysler, Porsche, Fiat and Renault.

The Commission's proposal is part of the European Union's efforts to fight climate change.

Source:http://www.walshcarlines.com/pdf/nsl20072.pdf

Fiat maintains lowest average CO2 emissions in Europe

Fiat is the brand that keeps maintaining the lowest average CO2 emissions in Europe last year, with an average of 119.8 g/km, which is certified by JATO Dynamics, the world's leading provider of automotive intelligence.

In the past six years, Fiat has reduced its average CO2 emissions by about 13% from 137.3 to 119.8 g/km, a result that is significantly lower than the average target set by the European Union for 2015 which is 130 g/km.

Source: http://newelectriccars2014.com/fiat-maintains-lowest-average-co2-emissions-in-europe/#ixzz2ai8VS3bp

Japanese Automakers Say Not Possible to Meet Europe's 120 gCO2/km Target by 2012

9 May 2007

The Japanese Automobile Manufacturers Association (JAMA) has published a response to the European Commission's proposal to institute binding limits of greenhouse gas emissions on new vehicles by 2012: an average 130 g/km from the vehicles, with another 10 g/km to come from lower carbon fuels and other measures. While saying that it supports the Commission's objectives, JAMA expresses concern over the implementation dates, the legislated emissions framework, and the focus on vehicle technology. JAMA members are making every effort to meet the interim target of 140 g CO2/km by 2009. If JAMA members are to meet the Commission's new target of 120 g/km by 2012, the CO2 emissions rate will have to be cut by a further 20 g/km in only 3 years. **JAMA therefore does not believe that it will be possible to meet the ambitious 2012 target in such a limited time frame.**

The Euro 5/6 standards and environmental and safety regulations will constrain efforts to cut CO2, according to JAMA.{E4} Modification required to pass the Euro NCAP crash-impact tests increase vehicle weight, as do safety belts, other restraint systems and the ISOFIX system, according to JAMA. Modification to vehicle shape to protect pedestrians in the event of a collision increases weight and aerodynamic drag.

The association supports an integrated approach similar to the "three-in-one" approach being taken in Japan: greater fuel efficiency through vehicle technology improvements; improved traffic flow through road infrastructure improvements and improved traffic management; and "eco-driving".

Source: www.greencarcongress.com

Toyota has nearly reached the 2015 Goal

Toyota reduziert CO2-Ausstoß abermals deutlich

März 29, 2011 | Keine Kommentare

Der Toyota Prius ist eines der ersten und heute meist verkauften Autos mit Hybrid-Antrieb. Foto: Toyota/Auto-Reporter.NET

Toyota ist den von der Europäischen Union vorgegebenen Zielen zur CO2-Reduzierung näher als jeder andere in Europa vertretene Automobilhersteller. Dies belegt eine aktuelle Studie des Marktforschungsunternehmens JATO Dynamics für das Jahr 2010.

Demnach konnte Toyota den durchschnittlichen CO2-Ausstoß für Neufahrzeuge von 130,1 g/km im Jahr 2009 auf 128,2 g/km im Jahr 2010 verringern. Der durchschnittliche CO2-Ausstoß aller in Europa neu zugelassenen Pkw sank im Jahresvergleich von 145,8 auf 140,9 g/km.

Während die Europäische Union für die gesamte Automobilindustrie einen generellen CO2-Grenzwert von 130 g/km festgelegt hat, der bis 2015 erreicht werden muss, gelten für die einzelnen Automobilhersteller individuelle CO2-Grenzwerte auf Basis des durchschnittlichen Fahrzeuggewichts. Für Toyota gilt ein Zielwert von 124,8 g/km. Um dieses Ziel zu erreichen, ist eine weitere Verringerung der durchschnittlichen CO2-Emissionen um 4,2 Prozent bis 2015 erforderlich. Die Lücke zwischen dem aktuellen Wert und den EU-Vorgaben ist damit kleiner als bei jedem anderen Hersteller.

Toyota reduced av. CO_2 emissions again significantly to **121.7 g/km in 2017** and is now clear below the goal for 2015, which is for the company 124.8 g/km CO_2

Reaction in Germany to the Proposal of the EU Commission in 2007

The German minister for Economy Michael Glos (CSU): The plans of the EU-commission are equivalent to a “destruction campaign” ("Vernichtungsfeldzug") against the German automotive industry. "The draconian penalty payments, which are visible today, endanger thousands of workplaces in Germany." The proposal of the EU-commission includes an extreme over proportional burden of bigger cars, which mainly build in Germany: "Under the cover of environmental protection it is executed a massive interest policy.

Also the German Chancellor (CDU), Angela Merkel, sharply criticized the proposals of the EU- commission. "There will be executed industry policy to the disadvantage of Germany", she said."We aren't happy the the result", emphasized the Chancellor.

"The reaction of the German car manufactures. "This distortion of the market", said a BMW- spokesman."We would have wished fair, realistic and timely executable regulation", criticized a spokesman from Volkswagen. “The proposal will be penalize the German car manufactures” .

BMW EfficientDynamics

Sheer
Driving Pleasure

Best in class: 24 models with no more than 140 g/km CO2

1 Series

Three-door
- 116d
- 118d
- 120d
- 123d

Five-door
- 116d
- 118d
- 120d
- 123d

Coupé
- 118d
- 120d
- 123d

Convertible
- 118d
- 120d

3 Series

Sedan
- 316d
- 318d
- 320d

Touring
- 318d
- 320d

Coupé
- 320d

Convertible
- 320d

5 Series

Sedan
- 520d

Touring
- 520d

X models

X1
- sDrive18d
- sDrive20d

Cleaner cars mean more jobs at BMW

Thursday, December 16, 2010

The German car maker BMW wants to recruit 2600 new employees in the next few months as part of efforts to make its fleet more environment-friendly.

A spokesman for the company said it wanted to bring in experts to work on electric vehicles, hybrid powertrains and cleaner combustion engines to increase its production of cars with lower CO2 emissions, because of the increasing need to comply with environmental regulations. T&E says it is the latest evidence that suggests environmental regulation leads to job creation.

Source:http://www.transportenvironment.org/News/2010/12/Cleaner-cars-mean-more-jobs-at-BMW/

Reduction Goals Daimler

In 2012 the entire fleet of Mercedes-Benz Cars vehicles in Europe emitted an average of 140 grams of CO2 per kilometer. We therefore reached our target for 2012 (approximately 140 grams of CO2 per kilometer) which means a reduction by more than 20 percent over the last five years. The decline amounted to more than 6 percent in 2012 alone.

Our goal is to reduce the CO2 emissions of our new-vehicle fleet in Europe to 125 grams per kilometer by 2016. Also for the light commercial vehicles the current emissions legislation also sets ambitious goals.

Source: www.daimler.com
Sustainability Report 2012.

Fuel saver version of the Opel Corsa with 3,3 l fuel consumption and 88 g/km CO2.
The 1.3 CDI Ecoflex with 95 hp and start-stop-system has 0,9 l less consumption than basis model. This was achieved by improved aerodynamic, reduced rolling resistance and a smaller fuel tank.

Source:http:opel.de

Top 20 best-selling brands ranked by average CO2 emissions (volume weighted)

Position	Brand	2012 Average CO_2 (g/km)	2011 Average CO_2 (g/km)	Difference	2011 Position
1	FIAT	119.8	118.3	+1.5	1
2	PEUGEOT	121.2	128.5	-7.3	5
3	RENAULT	121.3	129.0	-7.7	6
4	TOYOTA	121.7	126.4	-4.7	4
5	CITROEN	122.0	125.4	-3.4	3
6	SEAT	123.9	125.3	-1.4	2
7	MINI	128.6	128.6	+0.0	*
8	FORD	129.1	132.7	-3.6	8
9	KIA	129.3	135.0	-5.7	12
10	HYUNDAI	132.3	133.6	-1.3	9
11	SKODA	132.6	135.0	-2.4	11
12	OPEL/VAUXHALL	132.8	133.9	-1.1	10
13	VOLKSWAGEN	133.5	135.4	-1.9	13
14	NISSAN	136.5	142.0	-5.5	15
15	DACIA	137.9	143.7	-5.8	16
16	AUDI	139.3	146.2	-6.9	17
17	BMW	140.9	149.6	-8.7	18
18	CHEVROLET	141.6	141.2	+0.4	14
19	VOLVO	144.0	151.9	-7.9	19
20	MERCEDES	147.8	162.2	-14.	

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OUR KNOWLEDGE IS YOUR POWER

Cost

Statements of the EU Car Manufacture Association ACEA

The first ACEA estimates indicate that the maximum **technological potential** ("conventional" technologies, alternative powertrains, hybrids, etc.) to reduce specific CO2 emissions from new cars between 2008 and 2012 is 5%. Further analyses are, of course, needed to clarify this estimate. ACEA members will also continue bringing on to the market cars that emit 120g/km or less.

Societal Costs

An independent Study undertaken by ADL has demonstrated that excessive societal costs will be incurred if the automotive industry were forced to be the sole contributor to the Community's CO2 reduction objective concerning passenger cars. ADL expects 4000 Euro per car on average extra production costs, if the Community forces car manufacturers to reach the level of 120g/km by 2012. This would add up to 50bn Euro annual costs for EU society as a whole. Adverse impacts for the EU economy would include: a move of car production to non-EU countries, disappearance of large/premium cars, plant closures, sizeable job losses, decreased trade balance, reduced tax income

Source: ACEA paper 27/11/2003

Cost Figures published by the EU Car Industry

WHAT ARE THE COSTS OF CO_2 REDUCTIONS THROUGH VEHICLE TECHNOLOGY?

Within the European Climate Change Programme, the independent scientific institute, TNO, assessed in 2006 the costs and CO_2 reduction potential of different measures, including vehicle technology, biofuels and infrastructure. The costs of moving towards 120 gCO_2/km by 2012 through vehicle technology were calculated to be at about € 3600 on average per vehicle. The costs of reducing down to 130 gCO_2/km are still prohibitively high with at € 2500 per vehicle, endangering car production in Europe.

SOCIETAL COSTS: Taking into account the price of technology and the fuel savings for consumers, the TNO institute calculated societal costs of emission cuts through vehicle technology at between € 132 and € 233 per reduced tonne of CO_2, depending on the oil price. This is up to ten times more expensive than other traffic-related measures.

Source: ACEA Report:REDUCING CO2 EMISSIONS FROM CARS TOWARDS AN INTEGRATED APPROACH, 2007

Additional Production Costs for 20 % CO_2-Reduction (UBA 2007)

	Diesel		
Engine volume	**< 1,4 L**	**1,4 bis 2,0 L**	:
Av. CO_2-Emissions KBA, 2006	123 g/km	158 g/km	21
Av.fuel cons. Liter/100km	4,7 Liter/100km	6,0 Liter/100km	8,2 Liter/
Additional prod. cost UBA	**160 €**	**190 €**	
20 % CO_2-reduction	25 g/km	32 g/km	4

	Petrol		
Engine volume	**< 1,4 L**	**1,4 bis 2,0 L**	
Av. CO_2-Emissions KBA, 2006	145 g/km	180 g/km	2
Av. Fuel cons. in L/100km	6,1 Liter/100km	7,7 Liter/100km	10,4 Lite
Addiitional prod. cost UBA	**180 €**	**200 €**	

Has the EU CO2 Regulation increased the Car Prices? (1)

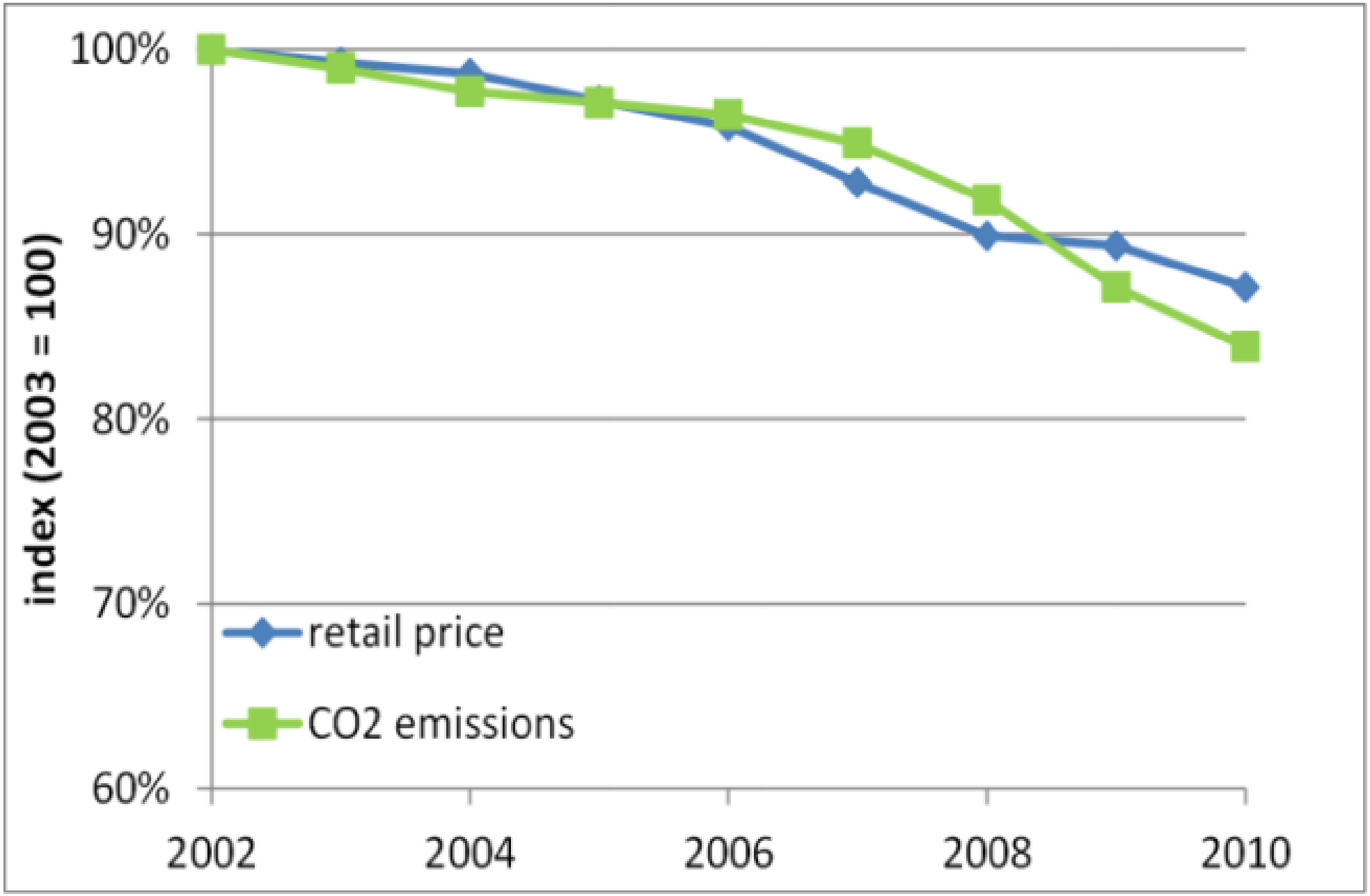
In the last 3 years the car prices in the EU dropped in real terms, which means the price increase was lower than the inflation rate.
2007:
The EU price index for cars (reflecting actual prices paid by consumers, including VAT and registration taxes) increased by 0.2 %, against 3.4 % for headline inflation. The price change was also quite moderate in the euro zone (+0.6 %), significantly lower than headline inflation (+3.2 %).
2008:
Real car prices declined by 3.1% in the EU
In the context of a recession which deeply affected the car sector during the last half of 2008, real (i.e. inflation-adjusted) car prices declined in 23 out of 27 Member States between January 2008 and January 2009. The EU price index for cars (reflecting nominal prices paid by consumers, including VAT and registration taxes) decreased by 1.3%, against a 1.8% rise in overall prices, translating into a fall in real car prices of 3.1%.
According to Eurostat figures on inflation, the dispersion shown by the report takes place in a context of car prices increasing significantly less than the average price for other products in the large majority of Member States: Car price went up by 1.3%, headline inflation rate by 1.8%

Has the EU CO2 Regulation increased the Car Prices? (2)

2009:
The EU price index for cars (reflecting nominal prices paid by consumers, including rebates, VAT and registration taxes) increased by 1.1%, against a 1.7% rise in overall consumer prices, translating into a fall in real car prices of 0.6%.

Real car prices for consumers expressed in the respective currencies fell in 24 out of 27 Member States in 2009 (Table 1). In the Netherlands they were stable whereas they increased in the UK (+7.7%) and Sweden (+2.7%). However, it should be recalled that car buyers in the latter two countries benefited from an extraordinary fall in prices (of -9.7% and -5.0% respectively) in 2008, so overall they are still better off today compared to the beginning of 2008. In the UK, the movement in prices also reflects the end of the temporary decrease in VAT, in January 2010.

Retail Price and CO_2 Emissions from new Cars



Cost reduction by CO_2 Standards

Mileage km per year	15000	consumption 2012
Fuel price €/l in 2020	2,00	5,50
Fuel saving in l/100 km	2,00	consumption 2020
Cost reduction per year in €	600	3,50
Savings in 5 years in €	3000	
Saving over life time in € (12 years)	7200	

CO_2 Emissions of Indonesian Cars

The 10 most sold models in Indonesia emit in sales weighted average 180 g/km CO_2

The sales weighted average in the EU in 2013 was 126 g/km CO2.

If the 10 most sold models in Indonesia would have to follow EU regulation they would only allowed to emit 120 g/km CO_2.

This means the Indonesian vehicles emits more than 50% more the the European vehicles or the Indonesian models consume 50% more than the European models of the the same weight.

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VW 1 Liter Car