

Context

Cars are responsible for an eighth¹ of Europe's carbon dioxide (CO₂) emissions. The amount of CO₂ produced is directly related to the amount of fuel the vehicle consumes – lower carbon vehicles are therefore more fuel efficient and cheaper to run. Lower fuel costs for drivers boost consumer spending in other areas creating jobs.

In 2009, the EU set legally-binding targets for new cars to emit 130 grams of CO₂ per kilometer (g/km) by 2015 and 95g/km in 2020.² In July, the Commission announced the outcome of its review of the modalities (ways) of achieving the 2020 target.³ Its proposal confirms the 95g/km target but outlines a series of unnecessary flexibilities that weaken the target leading to less efficient vehicles being sold. The benefits from the regulation would have been even greater had the Commission shown more ambition; this paper outlines how and the benefits that would result.

The EU's car CO₂ regulation

Road transport contributes about a quarter of the EU's total emissions of carbon dioxide (CO₂), the main greenhouse gas (GHG), which has increased by nearly 23% between 1990 and 2010. The European Commission's white paper on transport has calculated that to meet EU climate goals, transport would have to cut emissions by at least 60% by 2050 compared with 1990 levels (a 70% reduction compared with today's levels). Reducing CO₂ emissions from new cars is one of the simplest, most effective and important ways of cutting climate emissions.

The new Commission proposal for regulating car CO₂ emissions confirms that on average new cars sold in Europe in 2020 should achieve a target of average emissions of 95g/km. Each manufacturer is set a target for the average CO₂ emissions of the cars they sell in 2020. The target is linked to the average size (measured by weight) of the cars each manufacturer sells. Car manufacturers that exceed their limits are obliged to pay a fine of €95 per vehicle per gram/km over the target. The proposal **does not** limit emissions from individual cars which can be above the limit, nor does it restrict the choice of vehicles available to consumers to buy or affect manufacturers producing small volumes of specialist vehicles such as sports cars.

The current proposal is unambitious; an 80g/km target for 2020 and 60g/km for 2025 would increase the benefits.

There are widespread benefits of more fuel efficient cars

Regulation of car CO₂ emissions brings enormous benefits: it lower fuel bills for drivers; stimulates high-tech jobs in automotive engineering in Europe; lowers oil imports; and reduces greenhouse gas emissions. The money drivers save in lower fuel bills will help boost consumer spending and local economies.

A large and growing share of households' budget is pumped into car fuel tanks. If the Commission's proposal of 95g/km in 2020 is adopted the lifetime fuel savings would be between €2904 and €3836 (compared to 130g/km vehicles) depending upon future oil prices.⁴ More fuel efficient vehicles are also likely to benefit from higher resale values. By lowering fuel costs motorists will have more disposable income they can spend on local goods and services – benefiting the EU economy. The European Commission estimates⁵ that avoided fuel use will progressively rise to €36Bn per annum in the period 2025-30 and will boost annual EU GDP by around €12bn.

At current oil prices, Europe imports around €300 billion worth of oil annually, one third of it for cars, denying the EU economy vital investment. this money could be invested in the EU economy. Reduced oil consumption leads to lower oil imports that in turn reduces international oil prices; increases resilience to oil shocks; and enhances investment opportunities in new industries increasing innovation and competitiveness. The aggregate benefit (between 2020 and 2030) of improved energy security as a result of adopting a 95g/km target is estimated to be €20bn.⁶

More fuel efficient vehicles and e-mobility increase employment

The development of advanced technologies to improve the efficiency of vehicles generates high value engineering jobs. Fraunhofer-IAO et al,⁷ estimate a worldwide market growth of €43.4 billion for solutions to reduce CO₂ emissions from conventional vehicles. This could generate approaching 150 thousand jobs globally.⁸ McKinsey⁹ estimates that by 2030, 110,000 new EU jobs can be created in production and R&D, especially in chemicals and electronics sectors through the need to produce more fuel efficient vehicles. Fuel efficient vehicles and technologies are increasingly in demand globally and represent a significant export opportunity for EU companies, potentially reducing current overcapacity. Automotive suppliers have welcomed the Commission's proposals stating that "the 2020 targets offer a clear and stable legal environment for investment, and will further stimulate innovation by vehicle producers and component suppliers."¹⁰

Lower carbon fuel efficient vehicles pay for themselves in reduced fuel bills and higher resale values

The Commission estimates, based upon analysis from TNO,¹¹ that the average additional manufacturing cost of achieving a 95g/km target (compared to the current regulation) would be around €1000 per vehicle but could be as low as €760. ICCT¹² estimates similar costs. It should be noted that the future costs of technology are always over-estimated – usually by more than a factor of two.¹³ This is because once a regulation has been adopted, cheaper more efficient ways to reduce emissions are developed. Studies estimating future technology costs also assume that the costs of technology are cumulative - but this is not always correct. Table 1 summarises additional costs, fuel savings and payback periods for 95g and 80g targets for 2020, and a 60g target for 2025, compared to the current 130g target. The calculation uses reasonably conservative¹⁴ assumptions. Using more optimistic¹⁵

assumptions, lower technology costs and margins, and higher fuel costs produces a payback period for the 95g target of less than one and a half years. Taking account of higher resale value further lowers payback periods.

	Target Year	130g/km 2020	95g/km 2020	80g/km 2020	60g/km 2025
Fuel economy (real world driving - litre/km)		0.063	0.046	0.039	0.029
Additional purchase cost ¹⁶		0	€1236	€2225	€3708
Annual fuel cost		€2008	€1472	€1243	€937
Fuel cost saving (compared to 130g)		0	€535	€765	€1071
Simple payback – years		-	2.3	2.9	3.5

Table 1: Cost and benefits of alternative fuel economy targets

In 2007, the car industry warned that cars would become “unaffordable”¹⁷ if the 130g target was adopted. The retail price of cars has actually fallen in real terms.¹⁸

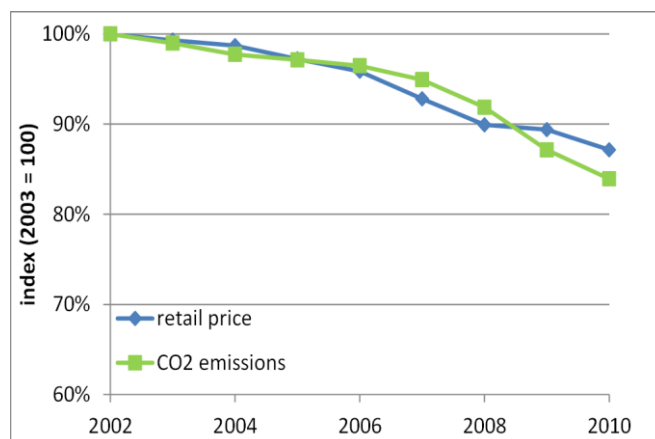


Figure 1: Retail price and CO₂ emissions from new cars¹⁹

Typically private new car buyers keep their new cars for around five years and will save money as a result of tighter CO₂ targets through both lower fuel bills and higher resale values. Consumer organisations have welcomed the proposed regulation.²⁰ Three quarters of transactions, cars are bought second hand where the costs are minimal but the benefits are substantial. In the EU, fleets buy around 50% of newly-manufactured cars which are typically kept for three to four years. These fleet companies base purchase decisions on the total costs of ownership, and with tighter CO₂ targets, these costs will fall. Several major leasing companies have welcomed the 95g/km target.²¹

Europe is at risk of losing its leadership in low carbon vehicle technology without ambitious 2020 and 2025 proposals

New standards recently confirmed in the USA will mean that the technology being used in American vehicles by 2025 will be more advanced and achieve bigger improvements in fuel efficiency than in typical European vehicles.²² There is a real danger that Europe will lose its competitive edge in low carbon vehicles if manufacturers here don't get a big enough push to introduce the latest technologies. As Renault has stated: “without strong regulation the car industry will not move at the right speed.”²³ BMW recently admitted that it was “absolutely

true” that European auto exports would not be able to compete with the US if the fuel economy gap remained so wide.²⁴

Smart regulations drive innovation and countries globally are setting increasingly stringent CO₂ or fuel economy targets. By developing lower carbon vehicles, EU suppliers and manufacturers can supply fuel efficient vehicles and technologies into emerging, growing markets.

There is ample technology to achieve the targets

Most manufacturers will achieve the target through downsizing engines with turbochargers, improved aerodynamics, stop-start systems and other low cost-solutions. There will be some hybrid vehicles (estimated to be 5-15% of new car sales),²⁵ these will be mainly in the larger vehicle segments that are less price sensitive. Manufacturers will not need to sell electric vehicles to achieve their targets, although some may choose to. CLEPA also estimates that in 2020 just 2 - 5% of new vehicles will be electric. Fuel efficiency legislation is the most effective tool to guarantee a market for high tech, low-CO₂ technologies and to spur investment in research, development and manufacturing.

The 95g/km target “can be reached with available technologies by 2020”.²⁶

In 2010 global vehicle production grew 26%²⁷ and some car manufacturers are highly profitable. Other parts of the European market are depressed, worsening the long-standing overcapacity issues. Delaying or weakening the target will only worsen the long-term competitiveness of these companies by eroding the leadership position of European companies in developing fuel efficient vehicles and allowing overseas competitors from lower-cost economies to catch up. A phase-in will also delay the development and introduction of new technologies - reducing the number of jobs created - and impose additional unnecessary costs on drivers through higher fuel bills that reduce the wider economic benefits.

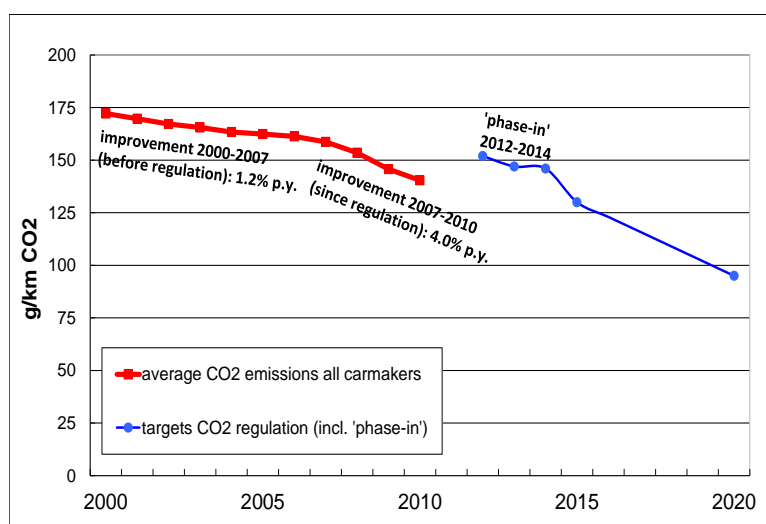


Figure 2: Car manufacturers are on track to achieve 95g/km in 2020²⁸

Flexibilities should not lead to target weakening

The benefits of a 95g/km 2020 target are substantial and flexibilities that weaken this are unnecessary. Phasing in the regulations, by allowing manufacturers to achieve their target in full after 2020, is totally unnecessary and detrimental – particularly to automotive suppliers that have made investments on the basis of the 2020 target. Car manufacturers have had 12 years to achieve the target - two full model cycles - and there is ample technology to achieve the target. Industry proposals, such as incentives for flex fuel or natural gas vehicles. Banking and borrowing of credits would similarly unnecessarily and significantly weaken and delay the achievement of the 95g/km target.

"Europe's industry is considered a world leader. We need the right kind of regulation to keep that advantage." ²⁹

Eco-innovations are technologies that improve the efficiency of the vehicle in real-world driving but not in the test cycle. The test-cycle and testing procedures need to be updated to be representative of real-world driving and the effectiveness of all technologies measured through the new cycle, removing the need for eco-innovations. However, a new test cycle and testing procedures are unlikely to be introduced before 2020. The current system of eco-innovations with robust evaluation of technologies can be retained in the interim. Steps to stimulate the range of eco-innovations should not weaken the current process and the total contribution of eco-innovations should be limited to 5 g/km *per vehicle*.

Regulations to reduce CO₂ emissions do not need to place an unnecessary burden upon manufacturers of niche vehicles where this serves no useful environmental benefit. The current system, however, needs to avoid market distortions and be more transparent. All niche vehicle manufacturers (producing no more than 10,000 vehicles per year) should achieve a 25% reduction in emissions from 2015 to 2020.

Supercredits are ineffective in encouraging electric and other ultra-low carbon vehicles market

The market for emerging ultra-low carbon (including electric and hydrogen) vehicles needs to be encouraged but super-credits are a poor and ineffective way to promote these technologies. Supercredits only encourage supply of ultra-low carbon vehicles whereas the key issue is the lack of demand. Supercredits, through the use of a multiplier, reward car manufacturers for electric vehicles that they have not actually sold. Figure 3 shows the amount of “hot-air” created by supercredits for different multipliers and market sizes, illustrating the extent to which this weakens a 95g/km target. Electric vehicles are not zero emission vehicles and the current design of the regulation already over-rewards their performance by ignoring emissions created in the production of the electricity - supercredit multipliers exaggerate this effect. For example, the effect of a multiplier of 3, and assuming electric vehicles made up 5% of new cars sales, the net effect would be to create 12g/km of hot-air and raise the 95g/km target to 107g/km.

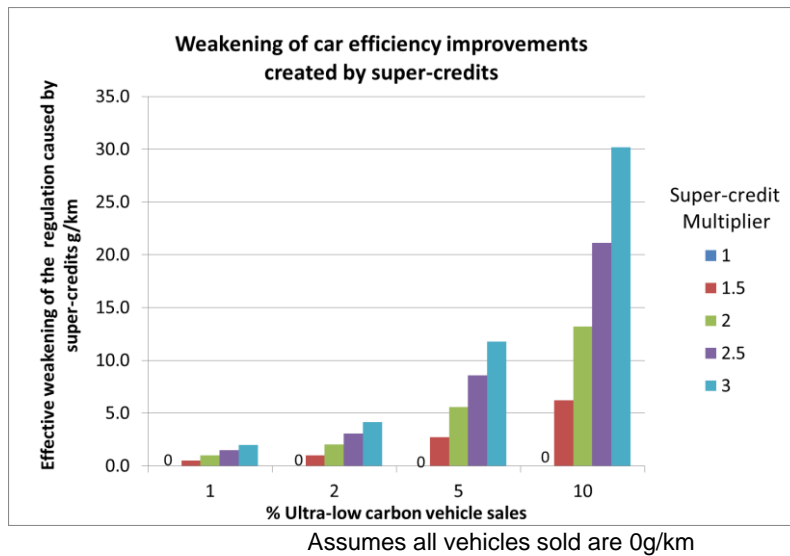


Figure 3: Weakening of the 95g/km target by supercredit alternatives

An alternative to supercredits is needed to stimulate the market for electric and hydrogen vehicles. This should focus on enhanced EU support for a network of fast-charging and hydrogen refueling stations – particularly along the Trans-European Transport Network; and more widespread exemptions from taxes for sub-35g/km vehicles until 2025. A flexible mandate would be equally effective as supercredits for increasing supply, but would not create the hot-air that weakens the target. A flexible mandate programme would establish a target for car manufacturers of 2.5% sales of ultra-low carbon vehicles by 2020. Manufacturers achieving 3% ultra-low carbon sales would be rewarded with a 1g/km reduction in their fleet average target. Manufacturers achieving less than 2% would be penalized with a 1g/km addition to their target. The flexible mandate would ensure all manufacturers support the shift to ultra-low carbon and reward those that over-achieve. Those that choose not to supply many ultra-low carbon vehicles would be expected to make a bigger contribution to improving the efficiency of conventional technology. The mandate, rewards and penalties would be strengthened for 2025.

A 60g/km target for 2025 and the introduction of a flexible mandate programme for 2020 will encourage all manufacturers to invest in ultra-low carbon solutions.

The regulation should also introduce a target of 60g/km for 2025 to send a clear signal about the ongoing direction and required pace of change. This would also provide a stimulus for ongoing research, development and demonstration of ultra-low carbon vehicles. Stricter fuel efficiency standards will lead to progressive improvements in CO₂ emissions from conventional petrol and diesel cars. But deep cuts are most likely to be achieved by a gradual electrification of drivetrains. Carmakers will only make that investment if they have certainty that the investments will be recovered. The 95g/km target is not sufficiently demanding to achieve a strong supply or demand for ultra-low carbon vehicles. A target of 80g/km target for 2020 and 60g/km for 2025 provide this stronger stimulus.

Manufacturers of vehicles that emit more CO₂ should need to make a proportionately greater reduction in their emissions

The system of distributing the effort for achieving the 95g/km target between car manufacturers is flawed and should be amended. The metric for assessing the “utility” of vehicles (mass in the Commission’s proposal) discourages light weighting of vehicles and should be replaced with an alternative footprint metric. To provide flexibility manufacturers could be allowed to choose between footprint and mass until 2020 – so long as this did not lead to any weakening of the 95g/km target.

The “slope of the curve” that allows higher targets for manufacturers providing larger vehicles should require these companies to make a greater proportionate reduction in emissions. The original slope proposed by DG Clima³⁰ (0.0296 gCO₂/kg or 2.96 g/km per 100kg) is more socially equitable and cost-effective as it leads to a smaller relative price increase. This slope has a smaller distortionary effect on the new car market and inter-manufacturer competition as highlighted in the Impact Assessment. Overall CO₂ emissions would also be lower under the Commission proposal as larger vehicles on average drive longer distances than smaller vehicles. By 2025 the introduction of ultra-low carbon vehicles should allow all manufacturers to achieve the same target – 60g/km.

Manufacturers of high emission vehicles should make larger emissions reductions.

The system of CO₂ measurement is not fit for purpose and should be strengthened

Legally-binding CO₂ standards introduced in 2009 have been effective in accelerating the reduction in car emissions. Between 2000 and 2007 emissions of the average new car (as tested on the standard test procedure) dropped by just 1.2% per year, on average. Since legislation was first announced in 2007, the average rate of progress has been 4% a year.³¹ It is also clear that a significant part of this improvement has been achieved through manipulation of the current test procedures to produce artificially low results.³² This has led to an increasing gap between the real-world fuel efficiency measured by drivers and that measured in tests. The tougher the regulation gets, the bigger the incentive for exploiting the flexibilities becomes. The manipulation of testing procedures is undermining consumer confidence in fuel efficient cars and depriving drivers and passengers the anticipated fuel cost savings. It is also cheating policy-makers of the intended outcomes of the regulation.

Utilisation of flexibilities may account for 40-50% of the net CO₂ emissions reduction between 2002 and 2010

Current testing procedures are not fit for purpose and four key actions are needed to address current weaknesses:

1. The European Commission must urgently bring forward proposals to stop current abuses and close the biggest loopholes in the test procedure. If the loopholes have not been closed by 2015, the 2020 target should be automatically adjusted

downward by 10g/km in recognition of the benefit that has accrued from test manipulation. Once the new test procedures have been implemented the target could return to the original value.

2. The Commission must bring forward proposals to strengthen and make more independent, consistent and transparent the current system of type approval. This may include establishing an independent EU-wide Type Approval Authority.
3. A new test drive cycle and procedures must be implemented that is representative of average real-world driving in Europe. This should include conducting tests with relevant auxiliary equipment, such as heating and air conditioning systems, switched on.
4. The current system for Conformity of Production (which aims to ensure production vehicles achieve a performance level that is representative of results obtained during type approval) must be strengthened. Significant deviations between results obtained using the new test and procedures and real-world driving must result in type approval being withdrawn.

Weaknesses in the current testing regime should no longer be allowed to undermine the regulation.

Strengthening the proposal is affordable and would increase the benefits

Policy-makers can strengthen the Commissions proposal by:

1. Introducing an 80g/km target for 2020 to maximize the benefits of fuel efficient vehicles.
2. Establishing a target of 60g/km for 2025 to give a clear policy signal and drive development of electric powered vehicles.
3. Avoiding flexibilities designed to weaken the proposal and ensuring the regulation is met in full in 2020 so Europe's leadership is retained.
4. Demanding loopholes in the current test procedure are closed by reducing the target by 10g/km to take account of testing manipulations until this is achieved.
5. Replacing supercredits that dilute the target with a flexible 2.5% mandate for ultralow carbon vehicles that gives a similar incentive without weakening the target.
6. Providing manufacturers with the flexibility to use a footprint utility or a mass metric to increase light weighting; and, flatten the utility slope (to 0.0296 gCO₂/kg).
7. Introducing a package of support to stimulate demand for ultralow carbon vehicles by supporting infrastructure and purchase through taxation.
8. Limiting the contribution of eco-innovations to 5g/km to vehicle and retain the current system of assessment and evaluation.
9. Revising the system of derogations for small volume manufacturers to improve the transparency and reduce market distortions.
10. Requiring the Commission to finalise and adopt a new robust test cycle and procedures and system of type approval and conformity of production.

These proposals will deliver cars fit for the future, and in reducing fuel consumption, the proposals will also help stimulate jobs and a competitive EU automotive industry.

Key messages for policy makers

T&E urges policy makers to introduce ten amendments to the Commission's proposal:

1. Introduce an 80g/km target for 2020 to maximize the benefits of fuel efficient vehicles.
2. Establish a target of 60g/km for 2025 to give a clear policy signal and drive development of new technology.
3. Reject phasing in the regulation that would put the current leadership of the European automotive industry at risk.
4. Avoid flexibilities designed to weaken the proposal such as banking and borrowing or allowances for flex fuel or natural gas vehicles.
5. Demand the Commission close loopholes in the current test procedure by reducing the target by 10g/km to take account of testing manipulations until they do so. The Commission should also be required to finalise and adopt a new robust test cycle and procedures and system of type and conformity of production.
6. Provide manufacturers with the flexibility to use a footprint utility metric or a mass metric with a slope of 0.0296 gCO₂/kg.
7. Replace ineffective supercredits that weaken the target with a flexible 2.5% mandate for ultra-low carbon vehicles with rewards and penalties for over/under achievement.
8. Introduce a package of support to stimulate demand for ultra-low carbon vehicles by supporting infrastructure and encouraging purchase through tax incentives.
9. Limit the contribution of eco-innovations to 5g/km per vehicle and retain the current robust system of assessment and evaluation.
10. Revise the system of derogations for small volume manufacturers to improve the transparency and reduce market distortions.

T&E's proposals will deliver cars fit for the future: lower carbon and cheaper to run and own; it will also help stimulate jobs and a competitive EU automotive industry.

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References

- ¹ European Environment Agency, 2011, Transport sector contribution to total GHG emissions, 2009 (EEA-32) <http://www.eea.europa.eu/data-and-maps/figures/transport-sector-contribution-to-total>
- ² Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009
- ³ European Commission Climate Action 2012, COM/2012/393, Proposal for a Regulation to define the modalities for reaching the 2020 target for reducing CO₂ emissions from new passenger cars
- ⁴ European Commission Impact Assessment supporting Proposal for Amending Regulation 443/2009 and 510/2011
- ⁵ Ibid 4
- ⁶ Ibid 4
- ⁷ Wirtschaftsministerium, Baden-Württemberg, Fraunhofer-Institut für Arbeitswissenschaft und Organisation (IAO), Wirtschaftsförderung Region Stuttgart GmbH (WRS) (Hrsg.); Strukturstudie BWe mobil: Baden-Württemberg auf dem Weg in die Elektromobilität; Stuttgart : Fraunhofer-Institut für Arbeitswirtschaft und Organisation, 2010
- ⁸ T&E 2012, Low Carbon Vehicles: Good for EU Employment
- ⁹ Boost! Transforming the powertrain value chain - a portfolio challenge; S.I. : McKinsey & Company, 2011
- ¹⁰ CLEPA Press Release 13th July 2012, European Commission confirms 2020 emission targets for cars and vans
- ¹¹ TNO 2011, Support for the revision of Regulation (EC) No 443/2009 on CO₂ emissions from cars
- ¹² ICCT 2012, Summary of the EU cost curve development methodology
- ¹³ T&E 2012, costs of vehicle regulation (in press)
- ¹⁴ Assumes real world fuel economy 19.5% higher than test results; 20000 km pa; Fuel cost €1.6/l ; uplift on purchase cost from additional manufacturing cost 23.6%
- ¹⁵ Assumes real world fuel economy 19.5% higher than test results; 20000 km pa; Fuel cost €1.7/l; uplift on purchase cost from additional manufacturing cost 12.5%; additional manufacturing cost €500
- ¹⁶ Ibid 12, additional manufacturing cost 95g/km - €1000; 80g/km - €1800; 60g/km (2025) - €3000
- ¹⁷ ACEA 2007, ACEA website comment on car CO₂ regulation
- ¹⁸ T&E 2011: How clean are Europe's cars?
- ¹⁹ Ibid 18
- ²⁰ BEUC 2012, Good for the environment and good for your pocket: consumer benefits of CO₂ emissions targets for passenger cars
- ²¹ Cleaner car contracts, letter to President Barroso, July 2012
- ²² ICCT 2011, Thought experiment: applying the proposed U.S. 2025 PV standards to the EU fleet
- ²³ Mr Philippe Doublet, VP/Automotive Engineering-CO₂ Renault Group, Driving the Future, Brussels, July 2012
- ²⁴ <http://www.euractiv.com/specialreport-electric-vehicles/us-electric-car-industry-poised-news-514807>
- ²⁵ CLEPA 2012, position paper on cars and CO₂ regulation; www.clepa.eu (July 2012)
- ²⁶ Ibid 12
- ²⁷ OICA 2011, <http://www.oica.net/category/production-statistics/>
- ²⁸ Ibid 18
- ²⁹ CLEPA 2012, Jean-Marc Gales, CEO, <http://www.reuters.com/article/2012/06/05/eu-cars-idUSL5E8H59C720120605>
- ³⁰ DG Climate Action 2012, Leaked interservice consultation proposal amending Regulation (EC) No 443/2009 to define the modalities for reaching the 95 gCO₂/km new passenger car fleet target in 2020
- ³¹ Transport & Environment 2011, How Clean are Europe's Cars
- ³² TNO 2012, Supporting Analysis regarding Technology Deployment and Test Procedure Flexibilities for Review of the Light Duty Vehicle CO₂ Regulations