

Regulating CO₂ emissions of new cars

Response to the EU “Public consultation on the implementation of the renewed strategy to reduce CO₂ emissions from passenger cars and light-commercial vehicles”

July 2007



**European Federation for
TRANSPORT and ENVIRONMENT**

Summary

Over the next two to two-and-a-half years the EU will take critical decisions on the fuel efficiency and CO₂ emissions of new cars sold in the European market.

The importance of these decisions for the future state of Europe and the World cannot be overstated.

Tackling fuel consumption and CO₂ emissions of new cars is the single most effective policy measure the EU can take to simultaneously tackle climate change, reduce dependence on oil, and to spur investment in low-carbon car technologies in Europe and elsewhere.

It is also a litmus test of the EU's credibility on climate change policy. Is Europe prepared to take the practical domestic measures needed to achieve a reduction of greenhouse gas emissions of 20-30% by 2020 ?

Finally, the decisions on vehicle standards taken in Europe, the world's largest new car market, already have a large impact on the largest market of the future, Asia. The impact of this EU policy will, in short, be global as other regions follow European legislation.

We sincerely hope European decision makers will see the huge environmental and strategic benefits of strong action, and act accordingly.

A summary of our views is given below. The remainder of the document gives the justification and explanation of each point.

Fleet average standards and timetables

- fleet-average CO₂ emissions of new cars sold in the EU should improve at a rate of 5% a year, achieving 120 g/km by 2012, 80 g/km by 2020, and 60 g/km by 2025.
- There is no justification for weakening the existing 120 g/km target to 130 g/km by 2012 as proposed by the European Commission. The 120 g/km figure was proposed in 1995, originally with a 2005 deadline. Therefore 2012 already represents an extraordinary 17-year lead time. A weakening of the target or lengthening of the timeframe is unacceptable;
- The standards in the legislation should be expressed in terms of energy efficiency rather than CO₂. This would better clarify the responsibility of carmakers for the energy efficiency of their products, and fuel suppliers for the carbon footprint of their fuels. The corresponding energy efficiency standards, for the CO₂ figures above are 1.64 (2012), 1.09 (2020) and 0.82 MJ/km (2025). Other measures should come on top of, rather than instead of, car fuel efficiency requirements;
- Regulatory gaps should be avoided as this risks further delays in achieving improvements, as well as non-compliance. Standards should be in place as of 2010, and revised annually;

Burden sharing

- The standards should have an impact on every individual car sold, in the sense that they should incentivise every manufacturer to improve the full model range (not just to improve the worst performers, or to offer just one or two 'eco-models');
- The regulation should be tougher for larger and more powerful cars than for smaller cars; this is more cost effective and fairer

- The regulation should not distinguish between car classes, i.e. it should promote low-carbon car *technologies* and low-carbon car *specifications* to the fullest extent possible;
- Any temporary differentiation of classes should be on the basis of footprint, surface area or number of seats. It should not be based on parameters such as height, weight or power of the car, as this would close off important avenues for CO₂ reduction and would have adverse effects on safety.
- In any event, differentiation on the basis of car class should follow a 'smooth line', rather than stepping through a limited number of class blocks.

Compliance mechanism

- The compliance mechanism is the cornerstone of the regulation – if this mechanism fails or is not strong enough, the whole regulation will fail;
- The compliance mechanism should ensure that the overall fleet average standard is met, and is met exclusively through sales of fuel efficient cars;
- The system should not be linked to the EU ETS or to any other outside carbon credit or compensation scheme;
- The offering of flex-fuel vehicles should not be a compliance option for reaching the target; to do so would confuse fuel efficiency product standards with standards for the carbon footprint of fuels which would weaken the effectiveness of the system; the carbon footprint of fuels is also dealt with by a separate EU legislative proposal;
- It should ensure that the European new car fleet average standard is met, regardless of whether or not the system is class-based
- Manufacturers that fail to meet the standard should face a penalty high enough to ensure compliance. 'Compliance through paying fees' as an option should end as of 2012. On the basis of the cost studies done for the Commission a penalty in the range of €150 per g/km 'overshoot' per car sold seems to be sufficient to achieve this objective;
- Manufacturers that perform better than the standard could be permitted – but not forced - to sell those credits to manufacturers that perform worse, in order to create incentives to make the model range better than the standard requires;

Transparency

Monitoring of progress under the new regulation and the publication of results should be done on a manufacturer specific basis. It should be clear to citizens who has made what progress, or conversely, has failed to do so. This is not only essential in order to obtain insight in the dynamics of CO₂ emission level reduction, but also to help promote 'fuel efficiency competition' among carmakers.

Other measures

The following additional measures should be incorporated in the legislation:

- Inclusion of light-duty commercial vehicles (vans);
- Mandatory fitting of intelligent speed adaptation (ISA) systems to ensure cars do not go faster than 150 km/h (15% faster than the highest enforceable or recommended speed limit in any EU Member State);
- mandatory fitting of gear shift indicators, 'green' zones on rev counters, and cruise control;
- mandatory fitting of tyre pressure monitoring systems;
- ambitious standards for in-car air conditioning systems; ensure that the regulation offers an incentive to sell cars without air conditioning;
- Ambitious rolling resistance standards and environmental labelling of tyres;

- Standards for low friction lubricants;
- The CO₂ labelling directive should be much better enforced, updated in order to account for advertising in new media, based on the colour-coding used in white goods energy labelling, and should contain an estimate of the difference in lifetime fuel costs of the car compared with a car with an 'average' label. At least 25% of advertising space should be dedicated to CO₂ information;
- a binding code for automobile advertising that outlaws false green claims and the association of cars with nature; a ban on advertising of cars that exceed fleet average CO₂ by more than 50%;

The impact assessment

The next impact assessment of the Commission should undergo drastic changes compared to the version that accompanied the Communication. It should:

- not assume that cars 'grow' autonomously and inexorably. Growth in the past was the result of car makers not complying with their voluntary CO₂ commitment.
- not just take into account low-carbon vehicle technology as a compliance mechanism, but also low-carbon vehicle specifications (i.e. smaller engines)
- take into account the consequences of inaction vs. action on oil prices, oil import costs and expenditure, and the impacts associated with exploitation of unconventional oil source, extraction of which is attributed to transport oil demand growth

For a background briefing, including history, on Europe's cars and CO₂ policy see: www.transportenvironment.org/Article427.html

Background: why car fuel efficiency is so important

European action to make cars more fuel efficient and therefore emit less CO₂ is one of the most important global climate policy measures, and probably the most important policy to reduce future global oil consumption.

Europe's car market has become very influential

Today, the European car market is similar in size to that of the United States, long the unchallenged number 1. Some 17 million cars and vans are sold in the EU27 each year.

Moreover, European car regulation has a big impact on global technology development. Almost all of Asia, widely expected to become the world's biggest car market in the next decade, follows European air pollution laws ('Euro standards') for cars. The only exceptions are Japan, South Korea and Taiwan (Source: ICCT). One of the reasons for this is that many Asian car makers aspire to compete on Europe's market.

European decisions on CO₂ emissions from cars will therefore have a big impact on the future development of the global car market.

Slow down climate change

Transport is a major contributor to climate change, and its absolute and relative share of emissions is growing. Consider the following facts:

- In 2005 transport was responsible for 29% of the EU27's CO₂ emissions.
- In the same year, transport emissions were 32% higher than in 1990, when the contribution of the sector was 21%¹.
- Almost half of those emissions are caused by cars, and another 10% by vans (light duty commercial vehicles).
- The total share of light duty vehicles in CO₂ emissions is hence 16%, in contrast to the 12% figure used by the European Commission. The Commission figure is out of date and just includes cars.

Reduce costs of oil imports, and associated geopolitical risks

A tonne of CO₂ is the result of burning approximately two barrels of crude oil. Transport is already responsible for almost 70% of the EU's oil use, and light duty vehicles are responsible for the majority of this, so around 35%.

At €50 a barrel and 80% dependence on oil from outside Europe, the annual transfer of wealth from Europe caused by this oil use is over €60 bn. This is a net cost to Europe's economy, not an investment. Dependence will soon grow to 90% and reserves of conventional oil are increasingly concentrated in politically unstable regions.

Additionally, the EU uses around 20% of the world's oil and its car regulation wields considerable influence over the emerging Asian car market.

Reduce energy prices

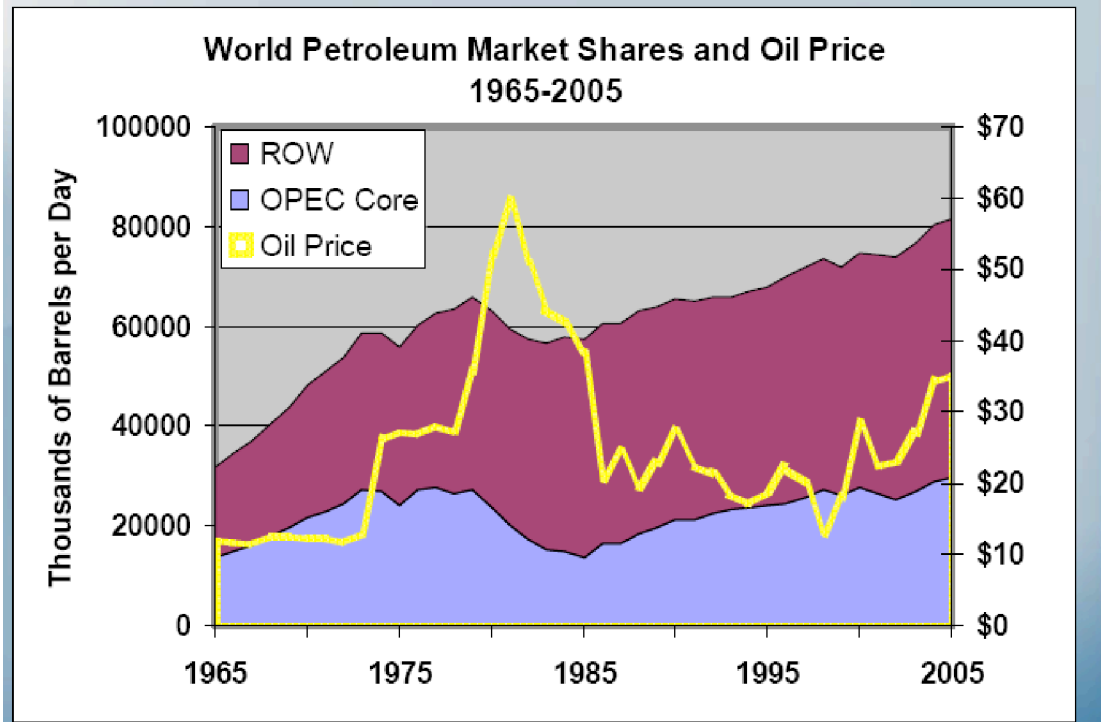
History and economic theory suggest that oil prices are very sensitive to oil demand. Evidence suggests that a 1% lower global oil demand would reduce prices by approximately 10% in the short term and 5% in the medium term². Successful policies implemented in the 1970s to reduce oil demand, such as the American

¹ http://reports.eea.europa.eu/technical_report_2007_7/en

Corporate Average Fuel Economy (CAFE) laws for cars, have been hugely successful at relaxing the oil market. See below.

Graph: inflation-corrected oil price versus global oil demand (ROW = Rest of the World)³

History and theory indicate that reducing oil demand contributes to lower prices and smaller shocks.



As an indication: if the EU's policy would reduce oil demand from cars and vans by a third, compared to 'no action', global oil demand would decrease by approximately 2% compared to no-action (not counting knock-on effects on Asia's vehicle technology development). At a 0.2 price elasticity that would lead to 10% lower oil prices in the medium term. At €50 a barrel, the EU spends approx. €250bn a year on oil. At 80% import dependence, a 10% lower oil price would hence mean a net annual saving of €20bn to the EU economy. We do not include the indirect savings due to resulting lower prices for natural gas.

This €20bn a year is comparable to the 'direct' savings on oil costs from improving fuel efficiency by a third, which the Impact Assessment calculates. Leaving this price-lowering effect out, as the Impact Assessment currently does, therefore underestimates economic benefits of improved cars by at least half.

Stop rush to unconventional oil sources, and the return to coal

Also, today's high oil prices (\$75 a barrel, cushioned to 'only' €55 a barrel because of the record-high \$/€ exchange rate) lead to a rush to alternatives to conventional oil.

²The one-year price elasticity of global oil demand for the oil price is estimated at -0.1, the five- to ten years' elasticity at -0.2. Source: Congressional Budget Office, *China's Growing Demand for Oil and Its Impact on U.S. Petroleum Markets*, Washington, April 2006, p.33

³ Source: David L. Greene, *Why manage oil demand*, presentation at IEA workshop 'Saving oil in a hurry', Paris, March 2005

Sometimes these alternatives are relatively 'clean' (for example some types of biofuels). But it is more often dirty 'unconventional oil' that becomes economically viable at oil prices sustained over roughly \$40 a barrel. Oil from tar sands, oil shale and 'coal-to-liquid' processes are extremely damaging to the climate: up to twice as much as conventional crude oil. Recent research suggests that within a decade all additional oil demand will be met with oil from unconventional sources such as these.

Additionally, lower oil prices could end the world's rush back to coal – as most contracts for natural gas are linked to the oil price – thereby reducing CO₂.

"The problem is that soaring oil prices have dragged up gas prices in much of Europe too, making coal cheap by comparison." (Reuters UK, 27 June 2007)

Spur investment in low-carbon technology

Legislation on CO₂ from cars will oblige car makers to implement CO₂-saving technology on their vehicles. Such technologies have been developed, and in many cases applied, but far from the extent possible.

Sadly, car buyers are rarely altruistic and generally irrational. They appear not to be willing to pay to avoid climate change, and do not even consider lifetime fuel savings, even if to do so would be in their own best interests⁴. Other factors generally take precedence. The lack of clear consumer information on CO₂ emissions and fuel efficiency from carmakers hasn't helped.

Just as the regulator needed to step-in to cut emissions of air pollutants such as NO_x and fine particles, regulatory action is needed to bring down CO₂ emissions.

CO₂ regulation will lead to a quicker and more widespread adoption of fuel-saving technology across Europe's car fleet. These technologies will be developed close to market by an extensive network of European suppliers. If Europe takes the lead, it will attract lots investment, particularly by suppliers. These investments will bring high-quality jobs to Europe.

Strong regulation will to slow climate change, strongly reduce our oil bill and bring high-tech development to Europe. Three very good reasons to act.

⁴ A wealth of material on this issue is available, e.g. *Car buyers and fuel economy?* Thomas S. Turrentine, Kenneth S. Kurani, *Energy Policy* 35 (2007) 1213–1223, April 2006

Standards and timetables

Regulation should express standards in terms of energy use (MJ/km)

T&E supports the submission by WWF EPO to this Consultation⁵ which argues that the standard for cars should be expressed in terms of energy use. The target should therefore be 1.64 MJ/km, which translates to 120g CO₂/km.

This makes responsibilities for the stakeholders much clearer: car makers are responsible for the energy efficiency of their vehicles, fuel suppliers for the lifecycle climate impact of the fuels they supply.

Just as the supplier of an inefficient fridge is not entitled to use the EU 'A' rating by claiming that consumers can run it on a renewable source of electricity, it makes no sense to allow carmakers to be given credit for a fuel efficiency target because the car has the capability of being run on a fuel with a lower lifecycle climate impact. There should be a clear division of responsibilities, and no 'double counting' of CO₂ reductions in overall EU climate policy.

It is also a much more appropriate solution for cars that are not (or not fully) propelled with hydrocarbons such as plug-in hybrids, electric cars or cars that can run on E85 or hydrogen. Rather than giving electric cars a rating of zero CO₂ emissions, their energy efficiency should be the benchmark, and power suppliers should be responsible for the CO₂ emissions per kWh of energy delivered. More detail on this proposal can be found in the WWF submission mentioned above.

Fleet-average CO₂ emissions on new cars sold in the EU should improve at a pace of 5% a year, to achieve 120 g/km by 2012, 80 g/km by 2020, and 60 g/km by 2025.

In energy-efficiency terms: 1.64 MJ/km by 2012, 1.19 MJ/km by 2020, 0.82 MJ/km by 2025.

Ongoing road passenger demand growth (about 2% per year) make such cuts necessary in order to come anything close to a 20% reduction of transport greenhouse gases from transport in 2020 compared with 1990⁶, or even a stabilisation of those emissions⁷.

The '120' target should be maintained

T&E firmly believes that the EU should stick to achieving 120 g/km by 2012 through improved fuel efficiency of cars, and that other measures should come on top of, rather than instead of, this measure.

First of all, EU leaders have recently agreed to cut greenhouse gas emissions by 20 to 30% depending on international action. These targets can only be achieved if we strengthen climate policies instead of weaken them.

Second, this target has had such a long leadtime and history of delays that a further weakening seriously undermines the EU's credibility.

⁵ http://assets.panda.org/downloads/wwf_CO2_from_cars_consultation_submission_final.pdf

⁶ As demanded by the European Parliament resolution of 12 July 2007 *on keeping Europe moving – Sustainable mobility for our continent* (2006/2227(INI))

⁷ Operational objective in *Review of the EU Sustainable Development Strategy (EU SDS)*, Council of the European Union, Brussels, 9 June 2006

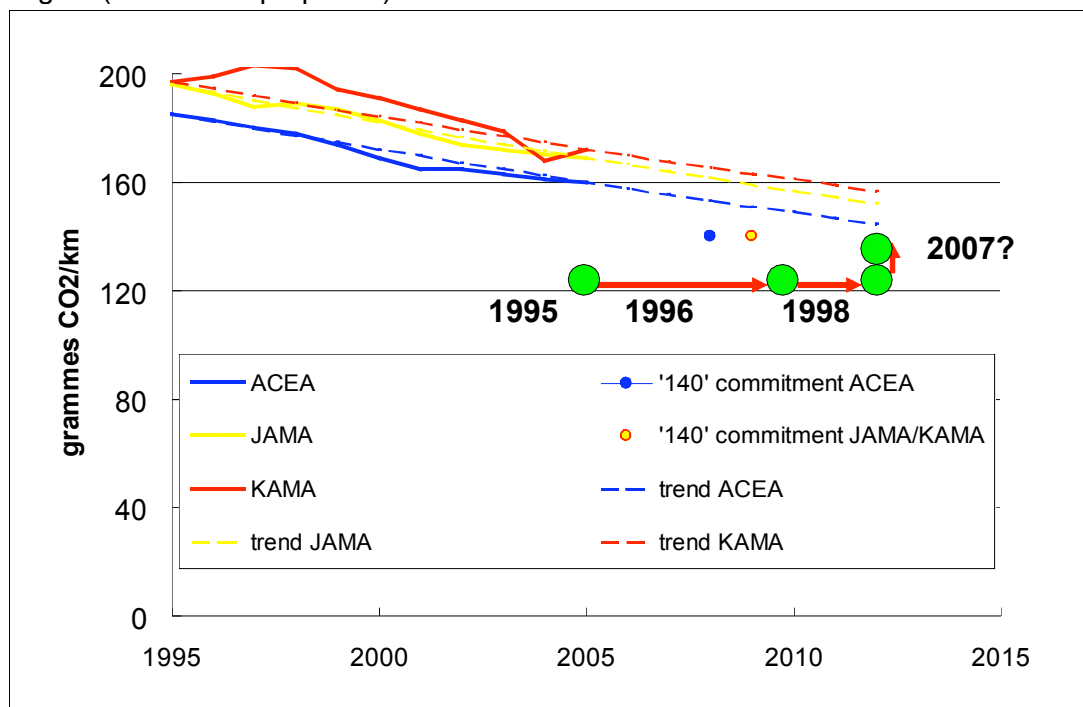
The 120 g/km target for 2012, which translates into fuel consumption figures of 4.5 litres/100 km for diesel cars and 5.0 litres/100 km for petrol cars, was proposed by Germany in the October 1994 Environment Council, following informal negotiations with other Member States.

After further endorsements it was formally announced in a Commission Communication in 1995.

The target has already been postponed three times. Originally the target date was set for 2005. The 1996 Council Conclusions introduced the term 'by 2005, or 2010 at the latest'. In 1998, when the ACEA voluntary commitment was struck, the deadline was shifted back to 2012. And last February the Commission proposed to weaken the target to 130 g/km by 2012. See graph below.

So the target has therefore been in place for 13 years now, and by 2012 the industry will have had 18 years of lead time to implement it. See below

Graph: EU15 new car average CO₂ emissions (realised and extrapolation), compared with voluntary commitments, and with repeatedly postponed and weakened EU targets (official and proposed)



On top of that, the car industry can make very significant emissions cuts from today's level.

Recent research shows that, if all cars on the market were equivalent to today's 'state of the art', CO₂ emissions would already be 20-25% lower⁸ than today, even without car or engine downsizing, or a move to hybrid technology.

There is also evidence that carmakers have held back fuel efficient technology. Recently Thomas Weber, DaimlerChrysler's head of R&D, admitted the company had so-called 'start-stop' technology (that saves fuel by switching off the engine when the

⁸www.cleangreencars.co.uk/jsp/cgcmmain.jsp?lnk=401&featureid=601&description=CO2%20targets%20-%20is%20the%20car%20industry%20crying%20wolf?&category=Clean%20Green%20Cars. Hybrid technology was left out of the 'state of the art'

car is stationary) on the shelf, but had so far refused to deploy it: “We had [stop-start] ready behind the curtain, but we held it back,” (Automotive News Europe, 23 July 2007).

Costs: biofuels are more costly than car technology

T&E has always been highly critical of the way car technology costs have been estimated in the preparation of the official Impact Assessment. See our detailed contributions and recommendations on cost estimates⁹, none of which have been taken into account. Invariably, the modelling that has taken place has led to overestimation of compliance costs.

Apart from the technicalities of the estimation approach, the fact that the consultants have extensively consulted with the car industry (who pay for technological improvements), while largely ignoring the suppliers (who benefit from them) has introduced a structural upward bias in the cost estimates.

Despite all the cost overestimations that have taken place, the Commission’s Impact Assessment¹⁰ shows that the cost of achieving:

- 120 g/km by 2012 through technical measures under the most plausible scenario (3) is just €19 per tonne of CO₂, well below abatement cost cut-offs recommended in recent analyses¹¹;
- 130 g/km by 2012 through technical measures would, in the same scenario, lead to net benefits, i.e. negative costs. Benefits from fuel savings outweigh technological costs.

Biofuels on the other hand would, according to the impact assessment, cost on average €158 per tonne of CO₂ avoided. More use of biofuels and less of car technology measures would therefore lead to higher costs to the Union.

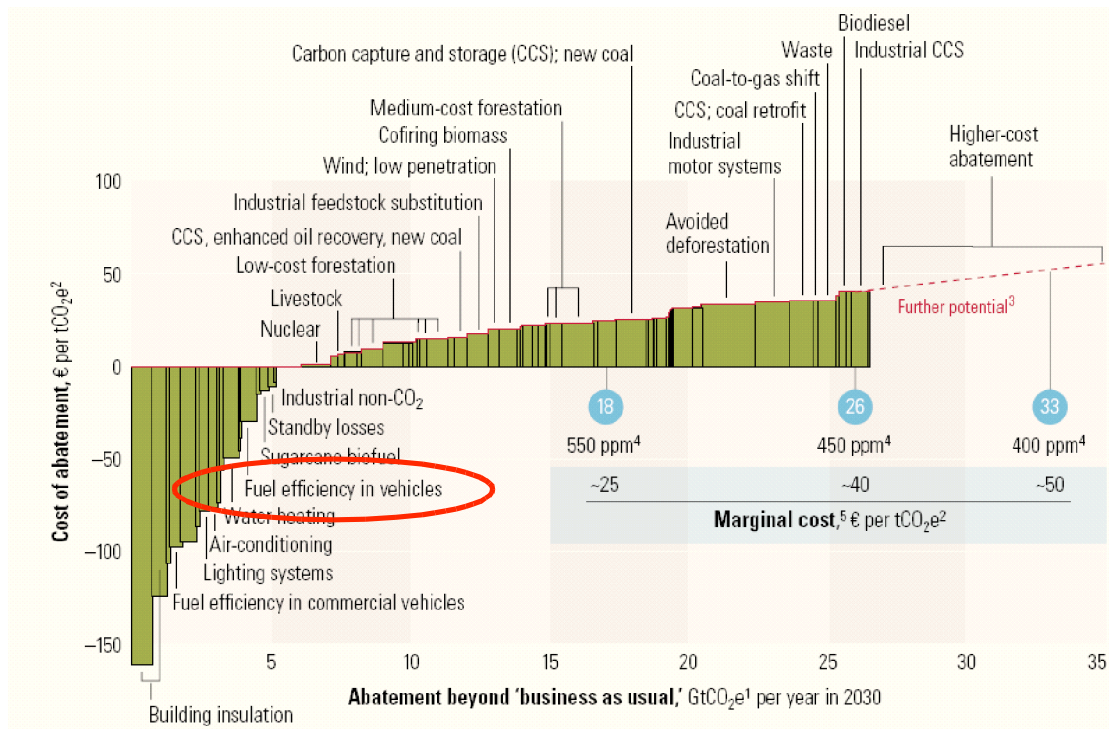
McKinsey research¹² ranks fuel efficient cars as a cost effective measure – the cost is minus £50 (€70) per tonne abated. The reduced fuel costs outstrip technology costs. Biodiesel is ranked as one of the most expensive measures. See below.

⁹ See for example the T&E contributions to the ECCP working group http://circa.europa.eu/Public/irc/env/eccp_2/library?l=/light-duty_vehicles/meeting_february_2006/2006_response_questions/ EN_1.0 &a=d and http://circa.europa.eu/Public/irc/env/eccp_2/library?l=/light-duty_vehicles/4th_meeting/contribution_2006_1/ EN_1.0 &a=d

¹⁰ http://ec.europa.eu/reducing_co2_emissions_from_cars/docs/sec_2007_0060_1_en.pdf

¹¹ For example the Stern report, or the EEA report *Climate change and a European low-carbon energy system* (June 2005) shows that a €65/tonne CO₂ permit price would not be enough to achieve the EU’s greenhouse gas emissions of 20-30% by 2020

¹² A cost curve for greenhouse gas reduction, McKinsey for Vattenfall, May 2005



Further cuts to '80 g' and '60 g' are also feasible

Deeper cuts in the longer term are also feasible. Low carbon car *technology* will deliver a very significant part of the savings. But low carbon car *specifications* will also be critical. If cars are designed for lower top speed and equipped with lower power, not to mention if SUV-sized cars are eliminated from the car market, massive CO₂ savings will be attainable.

Simulations by Umweltbundesamt show a 33% reduction in CO₂ emissions if the maximum speed of a car were capped at 160 km/h.¹³ The German company Loremo aims at producing a 40 g/km car by 2009, that can achieve 160 km/h.

¹³ www.greens-efa.org/cms/default/dokbin/187/187462.how_to_reduce_car_emissions_by_a_friedri@fr.pdf , slides 11/12

Regulatory system and burden sharing

The next critical issue is how the standards should apply and how the effort required should be shared out amongst carmakers.

We start with a number of important regulatory principles, and then deal with some more specific issues such as possible car attributes on which a standard could be based, the compliance regime, and the issue of transparency.

Principles

The rules should ensure that the overall fleet average efficiency standard is met every year. Only vehicle efficiency measures should count towards reaching the standard. Alternative fuels and outside credit mechanisms should be ruled out.

The rules should affect every individual car sold, in a sense that it must incentivise manufacturers to improve their full model range (not just to improve only their worst performers, or to offer a few 'eco-models');

The rules should be tougher for bigger and more powerful cars as this is more cost effective and fairer. Cutting emissions from a 250 g/km car by 1% gives twice the benefits per kilometre of cutting emissions of a 125 g/km car by 1%. In addition, big cars generally accumulate higher mileages over their lifetime than smaller cars, improving the cost effectiveness of improvements. It is also fairer to ask bigger efforts from more energy consuming cars, as it is these cars that have led to the failure of the voluntary industry commitment to achieve 140 g/km by 2008/9. Finally, bigger cars are bought by wealthier customers, making improvements easier to pay for.

Car makers could be allowed to offset sales of 'gas guzzlers' with fuel efficient 'fuel sippers' to meet the standard. In this way the policy works across the range: stimulating fuel sippers and penalising gas guzzlers at the same time.

Manufacturers that perform better than the standard could be allowed to sell their credits to manufacturers that perform worse. This gives carmakers an incentive to make their new car fleet more efficient than the standard requires. Credits would, by definition, be cheaper per g/km CO₂ per car, than the established penalty.

The rules should in principle not distinguish between car classes, i.e. set the same energy efficiency standard for every car, for reasons of effectiveness, efficiency and fairness. Only in this way would the system:

1. ensure that fleet average efficiency targets are met.
2. promote both low-carbon car *technologies* and low-carbon car *specifications* (e.g. smaller engines) to the fullest extent.
3. fully reward car makers that chose to honour the voluntary commitment (the '140' target).

Definition of a class parameter (as a temporary measure)

If the standard were to temporarily differ, depending on the class of car, the following requirements should be fulfilled:

The standard should be based on an objective car attribute, not be based on, for example, fleet average performances of companies. Giving every manufacturer a specific annual improvement target would be unfair as it penalises first movers.

A critical issue then comes up: on the basis of which objective car attribute should a car get a different efficiency standard ?

The car attribute should fulfil four criteria:

1. it should be a fair representation of consumer utility
2. it should keep as many possible avenues to improve fuel efficiency of cars open, i.e. it should not reward car makers for adding features that cost fuel.
3. It should avoid compromising the interior and exterior safety of vehicles.
4. It should not invite 'tampering' in the aftermarket, for example 'chip tuning'

Vehicle **weight** scores badly on all these criteria. This would eliminate reduced weight as an avenue to achieve efficiency improvements. It would reward car makers for making cars heavier, which directly affects fuel consumption and CO₂ emissions. Heavier cars inflict more damage to others in accidents so there are also serious safety implications to this attribute as it gives an incentive (weaker CO₂ limit) to heavier cars. Studies have consistently shown up to four times higher levels of severe injury and death for pedestrians in collisions with SUVs¹⁴ that distinguish themselves from normal cars primarily through their weight and height.

A DRI report, which formed an important basis for this rulemaking, showed that, if larger vehicles are safer for their occupants, it is not their weight but their size, more specifically their *footprint* (see below) that makes them safer¹⁵.

Finally, vehicle weight is not a criteria of interest to consumers.

Vehicle **power** scores very badly too. More powerful cars emit more CO₂, and are involved in more road accidents (as shown by their higher insurance premiums). In addition, power can easily be tampered with. Vehicles can be type approved with low 'official' power ratings, and subsequently be easily 'chip tuned' to achieve much higher power outputs. This practice is already especially popular in countries that base their tax systems on vehicle power.

Vehicle **volume**, defined as vehicle length x width x height, is perhaps one of the best customer value definitions that can be found. But it has major drawbacks, primarily because it includes vehicle **height**. Increased height of the car has a strong adverse impact on fuel efficiency as it increases the frontal area of a car. In addition, it makes the vehicle more prone to rollover accidents. It also makes cars more dangerous vis-à-vis pedestrians and cyclists. Studies have consistently shown up to four times higher levels of severe injury and death for pedestrians in collisions with SUVs¹⁶. SUVs distinguish themselves from normal cars primarily through their height and weight.

¹⁴ Henary BY, Crandall J, Bhalla K, Mock CN, Roudsari BS. Child and adult pedestrian impact: the influence of vehicle type on injury severity. *Ann Proc Assoc Adv Automot Med* 2003;47:105-26; Roudsari BS, Mock CN, Kaufman R, Grossman D, Henary BY, Crandall J. Pedestrian crashes: higher injury severity and mortality rate for light truck vehicles compared with passenger vehicles. *Inj Prev* 2004;10:154-8; Ballesteros MF, Dischinger PC, Langenberg P. Pedestrian injuries and vehicle type in Maryland, 1995-1999. *Accid Anal Prev* 2004;36:73-81.

¹⁵ Dynamic Research, Inc., *A review of the results in the 1997 Kahane, 2002 DRI, 2003 DRI, and 2003 Kahane reports of the effects of passenger and light truck weight and size on fatality risk*, DRI-TR-04-02, R. M. Van Auken, J. W. Zellner, Torrance, March 2004

¹⁶ Henary BY, Crandall J, Bhalla K, Mock CN, Roudsari BS. Child and adult pedestrian impact: the influence of vehicle type on injury severity. *Ann Proc Assoc Adv Automot Med* 2003;47:105-26; Roudsari BS, Mock CN, Kaufman R, Grossman D, Henary BY, Crandall J. Pedestrian crashes: higher injury severity and mortality rate for light truck vehicles compared with passenger vehicles. *Inj Prev* 2004;10:154-8; Ballesteros MF, Dischinger PC, Langenberg P. Pedestrian injuries and vehicle type in Maryland, 1995-1999. *Accid Anal Prev* 2004;36:73-81.

Vehicle **surface** (length times width), sometimes also called 'shadow' is a lot better than volume. Length and width of a car are important customer considerations, and the exclusion of height from the equation makes it a much better choice in the light of avoiding adverse impacts on fuel consumption and safety.

Vehicle **footprint**, defined as wheelbase x track width, is even better as this parameter avoids 'cheating' by adding big bumpers and other accessories that would increase vehicle surface. The new (March 2006) US light truck fuel economy regulation is based on footprint. The NHTSA (the responsible authority) has argued extensively for this choice in its final decision¹⁷. A DRI report, which formed an important basis for this rulemaking, showed that, if larger vehicles are safer for their occupants, it is not their *weight* but their size, more specifically their footprint, that makes them safer¹⁸.

Finally, the number of **seats** could be used as well. Cars are usually designated as 2, 4 or 5 seats. Bigger cars usually have 5 seats, smaller ones 4. This parameter does not automatically give wider cars a higher CO₂ standard (as surface or footprint do), leaving more CO₂ reduction avenues open than surface or footprint. But variations within 4- or 5-seat categories are wide, making it a somewhat less accurate indicator for customer value. Also, manufacturers could be tempted to fit a car, for example sport cars, with 'token' seats or a token fifth seat to apply for a more lenient standard.

In the table below we summarise our assessment of different car attributes.

Table: Overview of different car class attributes on which CO₂ regulation could be based

Car attribute	Score of car attribute on criteria				
	customer value	perverse incentive - fuel	perverse incentive - safety	risk of 'cheating' design changes or aftermarket tampering	total
weight	-	-	-	0	---
Power	0	-	-	--	----
volume (l x w x h)	++	-	-	0	0
surface (l x w)	+	0	+	-	+
footprint (track width x wheelbase)	+	0	+	0	++
# seats	0	+	+	-	+

All in all, the only attributes that come out favourably are **footprint, surface area or number of seats** of the car. Attributes should certainly not include weight, height or power of the car as they all have perverse effects, tampering issues, or both.

¹⁷ www.nhtsa.dot.gov/staticfiles/DO/NHTSA/Rulemaking/Rules/Associated%20Files/2006FinalRule.pdf, p.104-108. Quotes: 'Vehicle footprint is more integral to a vehicle's design than either vehicle weight or shadow and cannot easily be altered between model years in order to move a vehicle into a different category with a lower fuel economy target. (...) We also believe that use of the vehicle footprint attribute helps us achieve greater fuel economy without having a potential negative impact on safety. (...) Developing (...) standards based on vehicle footprint encourages compliance strategies that decrease rollover risk. (...) Overall, use of vehicle footprint is "weight-neutral" and thus does not exacerbate the vehicle compatibility problem.'

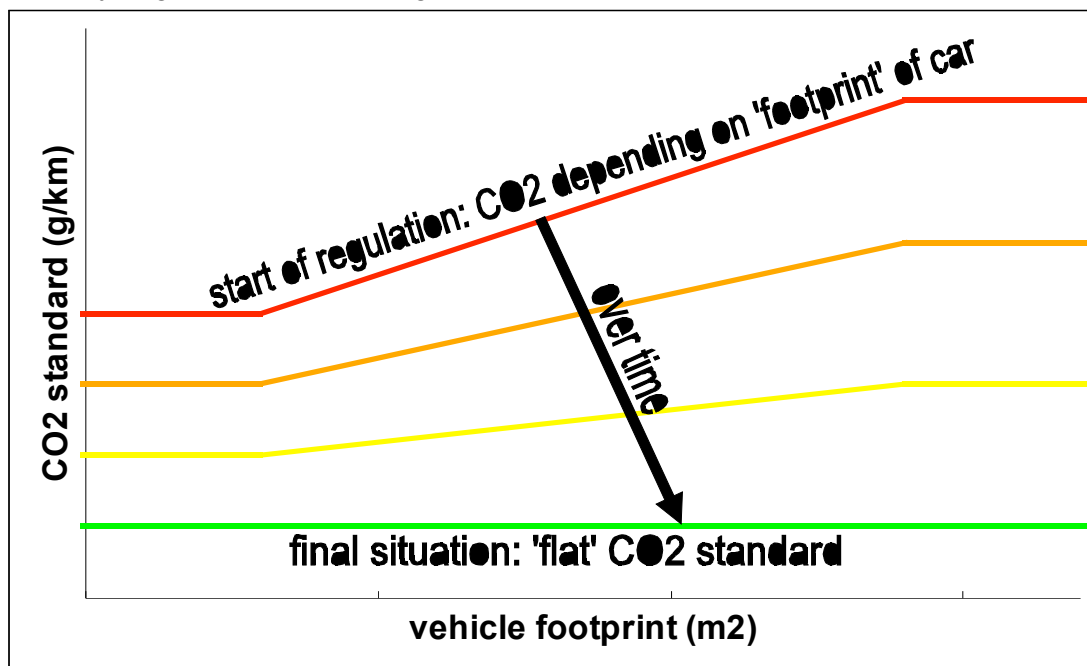
¹⁸ Dynamic Research, Inc., *A review of the results in the 1997 Kahane, 2002 DRI, 2003 DRI, and 2003 Kahane reports of the effects of passenger and light truck weight and size on fatality risk*, DRI-TR-04-02, R. M. Van Auken, J. W. Zellner, Torrance, March 2004

Also, the standard should be a **smooth and continuous line** depending on footprint, rather than abruptly distinguish between e.g. five car classes. Any such choice for car class is arbitrary and invites car makers to 'jump' to the next class in order to receive a more lenient efficiency standard.

If footprint is chosen as class parameter, one could decide to make the standard **flat** for both **very small** cars (e.g. < 3.3 m² footprint) and for **very big** cars (e.g. over 4.4 m²). In this way, extremely small cars (i.e. Smart) are not disadvantaged for their very small footprint, while extremely large cars (e.g. limousines) do not get extra benefits because they're so excessively long.

In any case, the standard should become **flatter**, i.e. less dependent on car class over time. Allowing bigger cars a higher CO₂ value is only temporarily acceptable to ease introduction of the standards. But the principle should remain that the same standard applies to everyone. Over time carmakers can adapt their model range or take other provisions to deal with the regulation.

The graph below gives a brief illustration of our views, in case the regulator would decide not to start with a 'flat' standard (same for everyone) right from the start. As discussed, in that case, the standard should be footprint-based (except for very small and very large cars) and converge over time.



Compliance mechanism

The compliance mechanism is the cornerstone of the regulation – if this mechanism fails or is not strong enough, the whole regulation fails because it does not ensure that the **overall fleet average standard is met**.

First of all, only energy efficiency improvements of cars should be considered as elements of the compliance regime.

Flex-fuel cars should not be allowed to count towards meeting the standard. Flex-fuel cars don't offer a guarantee that biofuels are used instead of fossil fuels. And even if biofuels are used there is no guarantee that indeed CO₂ emissions are lower. As said, the principle should be that carmakers should be responsible for energy efficiency of their new cars, and fuel suppliers for the lifecycle climate impact of their fuels. Such a separation also avoids 'double counting' of emissions reductions vis-à-vis Europe's low carbon fuels legislation.

Flex-fuel cars should hence only receive credits for the extent they offer energy efficiency benefits. If governments wish to promote flex-fuel cars they should work with specific flex-fuel quotas, not mix it up with energy efficiency policy.

Similarly, access to **JI/CDM** credits, or permits from the **EU ETS** should not be allowed to count towards the objectives. As we have described in the first chapter, there are numerous reasons why **cars specifically** should become more fuel efficient.

If the compliance regime is penalty-based, manufacturers that fail to meet the standard should face a **penalty** (buy-out price) high enough to ensure compliance. 'Compliance through paying fees' should be ruled out as of 2012. Car makers should make their cars more efficient, not pay fines and therefore the fines should be dissuasive.

On the basis of the cost studies done for the Commission a penalty in the range of €150 per g/km CO₂ 'overshoot' per car - or expressed in energy terms: €11 per KJ/km overshoot - sold seems to be sufficient to rule out such 'compliance through paying fees'¹⁹.

Transparency

Introducing transparency in efficiency performance by brand and by manufacturer group is essential. The public has the right to know which brands and which groups perform well and which fail. Timely and easily accessible information should be available on the Commission's website and those of the 27 member states, in all official languages, with at most a one month delay between sales and data availability. Weighted average efficiency per Member State, per country, per group, per brand and per model should also be available.

This is not only essential in order to obtain insight in the dynamics of CO₂ emission level reduction, but also to help encourage fuel efficiency competition between carmakers.

¹⁹ *Review and analysis of the reduction potential and costs of technological and other measures to reduce CO₂-emissions from passenger cars*, TNO/IEEP/LAT, Delft, October 2006, Figure 3.11 (p.63) shows that the marginal cost of achieving the 120g/km objective would be around €100/g/km. Including a safety margin of 50% which will be needed to achieve stricter targets, a fee of €150 per g/km per car seems sufficient.

Other measures

T&E believes that car efficiency and CO₂ standards should be exclusively met through making new cars more fuel efficient. Other measures should therefore come on top of, rather than instead of, energy efficiency rules for new cars.

Inclusion of vans (N1 vehicles)

The Commission is right to suggest that vans (light commercial vehicles, N1 vehicles) need to be included in the regulations. Standards and regulatory regimes should be aligned with those for cars as much as possible.

Speed adaptation devices

Today's cars are designed to break speed limits. The highest speed limits in Europe are 130 km/h, apart from a few derestricted stretches of Autobahn in Germany. It makes no sense that it is perfectly normal for a family car today to have a maximum speed in excess of 200 km/h. Such speeds require cars to be over-sized: oversized engines, oversized brakes, tyres etc.

A recent simulation by Umweltbundesamt shows what designing a car for 160 km/h top speed instead of over 200 can do²⁰ - a one-third reduction in emissions. Therefore, there should be mandatory fitting of intelligent speed adaptation systems that prevent cars from going faster than 150 km/h, which is 15% faster than the highest enforceable or recommended speed limit in any EU Member State;

Mobile air conditioning (MAC) systems

After the phase-out of refrigerants with over 150 Global Warming Potential through Directive 2006/40, the EU should now set standards to improve MAC's energy efficiency. Efficiency is often poor and big differences exist. A recent ADAC survey of five cars²¹ shows that, under similar circumstances, fuel consumption and CO₂ penalties between the five cars tested vary by a factor three. The best system increased CO₂ emissions by 10 g/km, while the worst increased it by 28 g/km.

The structural solution is to include energy use of MACs in the EU's test cycle. The EU would not be the first – the California Air Resources Board (CARB) has already proposed this in its AR1493-law that contains Californian car CO₂ standards. The methodology applied should certainly serve as an inspiration to the EU.

Temporarily and / or additionally energy efficiency standards should be set for MACs.

The regulation should also offer an incentive to sell cars without air conditioning. A manufacturer that sells, per member state, a lower-than-average percentage of cars with MAC should be rewarded, and vice versa.

²⁰ www.greens-efa.org/cms/default/dokbin/187/187462.how_to_reduce_car_emissions_by_a_friedri@fr.pdf, slides 11/12

²¹ http://www.adac.de/mitgliedschaft_leistungen/motorwelt/m_archiv/Pressemeldungen/Klimaanlage_im_Fahrzeug.asp?ComponentID=186154&SourcePageID=20057&location=33&TL=2

Tyres

A few per cent of CO₂ from cars could be saved through use of tyres with lower rolling resistance. A number of things need to happen to realise this potential.

First, car makers should be required to equip their new cars with tyres as efficient as those used for the vehicle's test cycle.

Second, standards should be developed for the rolling resistance of tyres. The Commission has already announced legislation and we urge them to come forward swiftly with an ambitious proposal that eliminates a significant percentage of inefficient tyres from the EU market, and also contains standards for noise and wet grip.

The proposal should also contain an integrated quality **label** that displays performance on noise, wet grip, and rolling resistance (including expected lifetime fuel cost savings compared to tyres that just fulfil the standard).

Last but not least, accurate tyre pressure monitoring systems should be installed in all new cars. Such systems have positive effects on safety, wear and tear (and thereby resource use and PM emissions) and fuel consumption / CO₂.

Lubricants

The proposal should ensure that car makers fit their cars with the same lubricant as they use in the test cycle. Additionally, friction standards for lubricants should be developed.

Measures to stimulate fuel efficient driving

Additionally, fuel efficient driving should be stimulated. Measures at EU level that could help to achieve this are mandatory fitting of:

- fuel consumption meters that display current fuel consumption / costs / CO₂, are easily readable and cannot be switched off;
- 'green' zones on rev meters that indicate areas of most efficient engine use, in addition to the current 'red' zones (costs maybe a few cents);
- gear shift indicators and cruise control.

More effective and responsible car advertising

It is obvious that consumer awareness of fuel consumption and CO₂ is important. But legal and voluntary efforts to raise consumer awareness have to a large extent failed, due to car makers not complying with the letter and / or the spirit of the law, and regulators failing to ensure appropriate national implementation and enforcement.

We observe the following problems:

EU CO₂ labelling directive

- The most important problem is that the directive is too vague and unspecific to ensure effective implementation in all Member States. The Directive is too vague on its scope, the amount of space / time that should be reserved for fuel/CO₂ information, and the graphic presentation of the information.
- It also does not cover new media (e.g. Internet sites)
- It is very poorly enforced – with countless examples of adverts without any CO₂ information found across Europe. As a rule, CO₂ information is in the 'fine print' of adverts, not given the prominence demanded by the existing directive.

Responsible advertising

- 'Greenwash' is an increasingly serious issue with manufacturers regularly making overstated, general or misleading environmental claims about their products
- International research shows that the majority of car adverts are for cars with above average CO₂

Therefore, the revised EU labelling directive should:

- Ensure that the legislation is much better enforced, particularly with regard to the inclusion and visibility of fuel economy and CO₂ emissions information in adverts.
- Provide for CO₂ and fuel economy data to be made more prominent in all marketing materials, taking at least 25% of the available layout
- It should include an A-G rating with the familiar colour-codes as well as annual fuel cost savings or extra fuel costs compared with an 'average' (D label) car, and relevant car tax information
- Be extended to cover all commercial communication for cars including, but not limited to, TV (including product placement), Radio, Cinema, DVD and video game advertising as well as Internet advertising / marketing.
- CO₂ and fuel economy data should be on screen and clearly visible for the duration of television / cinema / DVD commercials. CO₂ and fuel economy data should be included in radio advertisement scripts in a similar way to messages given in adverts for investment products.
- Be applicable to 'brand-only' advertising (i.e. adverts that do not refer to any individual models, but just to the vehicle brand)
- Be applicable to all commercial communication for second-hand cars manufactured after 2000 (when EU CO₂ test-cycle information became available).

The revised directive should also include a legally-binding pan-European car advertising code. This element should build on best practices currently available in Europe such as the UK DEFRA's 'green claims' code. It should:

- Ensure that complaints can be made easily and decisions on ads are taken swiftly;

- Forbid use of terms such as 'good for the environment', 'eco', 'green', 'environmentally friendly' to describe cars.
- Ensure that environmental information should be factual and based on specific data comparisons ('The 2007 model is 10% more fuel efficient than the 2004 model').
- Forbid association of cars with nature, animals etc.
- Ban adverts for the most polluting cars, i.e. those that emit more than 50% above the previous year's EU average, and ads for SUVs in cities.
- Forbid promotion of speed, acceleration, dangerous driving etc.

An improved impact assessment

The next impact assessment of the Commission should undergo drastic changes to correct the flaws of the version that accompanied the Communication of 7 February.

At a strategic level, it should take into account the issues mentioned in chapter 1 (Why car fuel efficiency is so important).

It should, for example:

- Take into account that the currently assessed costs and benefits of the policy are not symmetric. Fuel savings are real net financial benefits to Europe, while the costs are essentially not costs but investments in the high-tech car suppliers industry in Europe.
- Take into account the impact of his policy on oil prices and exploration of marginal (i.e. unconventional) oil, and assess the economic and environmental impacts of that;

On a more technical level, it should

- not assume that cars 'grow' autonomously in weight and power. The baseline scenario of the current impact assessment assumes that cars 'autonomously' will grow by 1.5% per year. Such an assumption, certainly if it is stretched far ahead in the future, obviously makes it much harder to reduce CO₂. The historic figure would have been much lower or even zero had car makers complied with their voluntary commitment or had regulation been in place in the past. Assuming this trend will continue is therefore a self-defeating assumption and a reward to car makers for not complying with their earlier commitments
- not just take into account low-carbon vehicle technology as a compliance mechanism, but also low-carbon vehicle specifications. This point has been extensively addressed in this submission.

For further information:

Kerstin Meyer, Aat Peterse

aat.peterse@transportenvironment.org

kerstin.meyer@transportenvironment.org

Transport and Environment (T&E)

Rue de la Pépinière, 1

B-1000 Bruxelles

Tel: +32 2 502 9909

www.transportenvironment.org