

## Context

Road transport is responsible for over 70% of transport CO<sub>2</sub> emissions which equates to 20% of the EU's total CO<sub>2</sub> emissions. In addition the sector is responsible for approximately half of the EU's €300bn/yr oil import bill.

In 2009 and 2011 the EU adopted two regulations to reduce these emissions by setting fleet average targets for the amount of CO<sub>2</sub> per kilometre a vehicle should emit, when tested on the EU's standardised test procedure:

- regulation 443/2009 setting 130 and 95 g/km CO<sub>2</sub> targets for cars for 2015 and 2020 respectively;
- regulation 510/2011 setting 175 and 147 g/km CO<sub>2</sub> targets for vans for 2017 and 2020 respectively;

The Commission is obliged to review the 'modalities' of reaching the two 2020 objectives by 1 January 2013. This review process has now begun in earnest.

In addition the EU is considering introducing CO<sub>2</sub> standards for heavy goods vehicles (lorries).

This paper summarises T&E's views on these pieces of legislation and provides ideas for further policy development. It should be seen as complementary to the answers we submitted to the EU consultation questionnaire.

## What is needed ?

Surprisingly enough only a few studies go into the question of what CO<sub>2</sub> standards for cars are necessary in order to meet climate change objectives. For example, the European Commission's modelling for the 'low carbon roadmap' for 2050 uses efficiency figures for the entire car fleet which is not comparable to the new car vehicle fleet average used in EU legislation.

But a 2009 study by Roland Berger<sup>1</sup> translates the International Energy Agency's (IEA) 'Scenario 450' (whereby CO<sub>2</sub> in the atmosphere is kept below 450 parts per million) into the necessary CO<sub>2</sub> limits for new vehicles. The graph below illustrates the result.

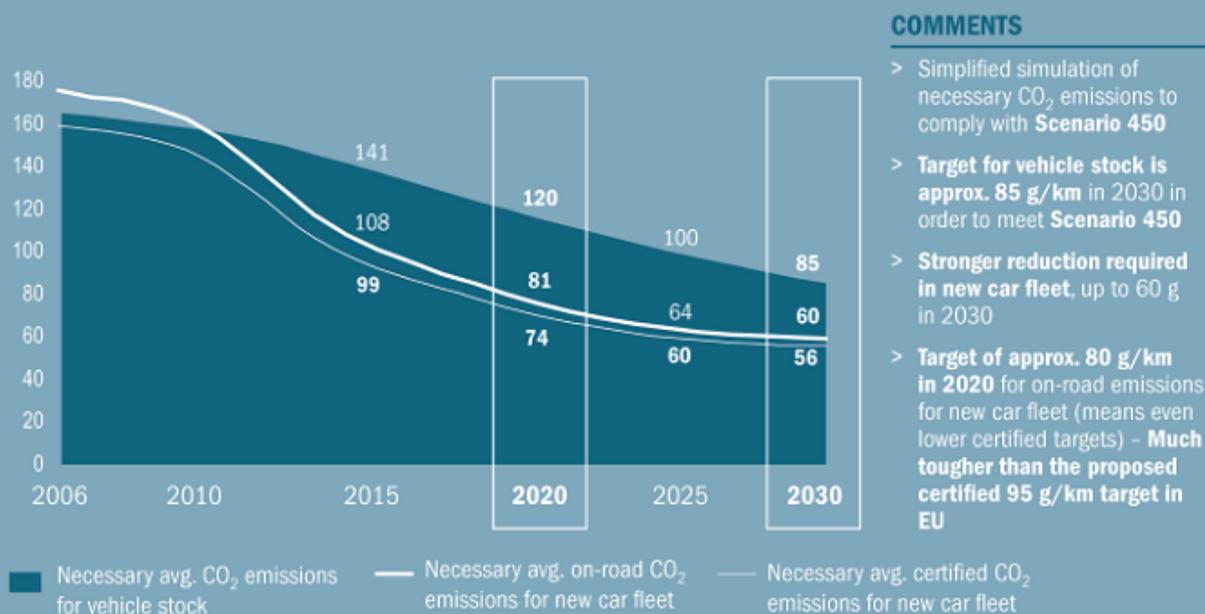
Graph: development in CO<sub>2</sub> standards for new vehicles 2015-2030 according to IEA's '450ppm' scenario in the 2008 World Energy Outlook

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<sup>1</sup> Powertrain 2020 – the future drives electric, Roland Berger, October 2009

**FIGURE 1.1-3: Simulation of CO<sub>2</sub> emission targets for new car fleet sales in Europe**

Necessary OECD Europe CO<sub>2</sub> fleet emissions for vehicle stock and new car fleet (g/km)



Source: IEA WEO 2008; Roland Berger

This study concludes that **CO<sub>2</sub> standards of 74 and 60 g/km for 2020 and 2025 respectively** are needed to hit the scenario targets. In other words, as the graph says: *‘Much tougher than the proposed certified 95 g/km target in EU’*.

### What is feasible?

Time and again carmakers have claimed that environmental legislation would either be unfeasible or would make cars ‘unaffordable’. Such claims have been proven wrong in numerous cases.

CO<sub>2</sub> is no exception, as the 2011 edition of T&E’s ‘How clean are Europe’s cars?’ report shows<sup>2</sup>. In 2010 the industry reduced its average CO<sub>2</sub> output by 3.7%, arriving at 140 g/km on average.

Studies conducted ten and five years ago predicted that reducing CO<sub>2</sub> emissions from new cars to an average level of 140g CO<sub>2</sub> /km would make cars €2,400 and €1,200 more expensive (from 1995 and 2002 baselines) respectively.

Meanwhile new cars have become 13% cheaper on average in real terms (accounting for inflation) over the past eight years. On a typical €20,000 car, that reduction equates to €2,600. It is probably coincidental, but nevertheless car prices have fallen more quickly since CO<sub>2</sub> reductions began in earnest, from an average of 0.7% per year over the 2002-2006 period to 2.4% per year on average over the 2007-2010 period.

This analysis shows that fears that reduction of CO<sub>2</sub> emissions would make cars unaffordable have been unfounded. In addition, the absence of any relationship between reduction of CO<sub>2</sub>

<sup>2</sup> How clean are Europe’s cars, 2011 edition, September 2011, [http://www.transportenvironment.org/Publications/prep\\_hand\\_out/lid/653](http://www.transportenvironment.org/Publications/prep_hand_out/lid/653)

and higher retail prices – if anything an inverse relationship was found – and the significance of the estimated cost figures (every % of CO<sub>2</sub> reduction would cost about 0.5% of a car's retail price) strongly suggest that the costs of reducing CO<sub>2</sub> to an average of 140g CO<sub>2</sub>/km were considerably overestimated.

A recent report by Greenpeace further underpins these points by analysing claims made before the CO<sub>2</sub> legislation, and what happened in reality<sup>3</sup>.

A recent speech by Bosch echoes a similar sentiment:

*'Whatever the creative ideas engineers might come up with, the experience we have garnered through developing pioneering powertrain technologies gives us the confidence to say that even the CO<sub>2</sub> targets of 70 grams per kilometre, in discussion for 2025, are achievable.'*<sup>4</sup>

## What the EU should do

### Targets

#### *Cars: 80 g CO<sub>2</sub>/km in 2020; 60 g CO<sub>2</sub>/km in 2025*

For **cars**, we think regulatory targets should be set at 80 g/km for 2020 and 60 g/km for 2025. 80 g/km for 2020 is necessary as explained above. It is also feasible certainly given the emerging evidence that a significant part of official CO<sub>2</sub> reductions is not due to technical improvement but more 'creative' use of tolerances in the test cycle (see next section).

#### *Vans: 125 g CO<sub>2</sub>/km in 2020; <100 g CO<sub>2</sub>/km in 2025*

For **vans**, the 147 g/km target for 2020 is far too weak, certainly given recent evidence that baseline emissions have been overestimated (see below). This means vanmakers would as a result have to cut their CO<sub>2</sub> emissions by only 19% from the 2010 baseline, which means technologies needed for vans would be seriously less advanced than for cars. It is environmentally and economically a pure waste if advanced technologies are developed, but not used in a part of the market.

In addition there is, as with cars, a strong likelihood that vanmakers will also use flexibilities in the test procedure to the maximum. We believe these developments offer even stronger reasons than is the case with cars for a downward adjustment of the 2020 target. We therefore believe that 125 g/km by 2020 is still eminently possible, a position we took when the law was first debated. For 2025 a target of around or below 100 g/km would be needed to ensure roughly equivalent technical efforts in the cars and vans sector. As baseline emissions become clearer these figures can be further specified.

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<sup>3</sup> <http://www.greenpeace.org/eu-unit/Global/eu-unit/reports-briefings/2011%20pubs/Nov%20-%20Dec/claimsVreality.pdf>

<sup>4</sup> Reducing CO<sub>2</sub> emissions with optimized internal-combustion engines, Paper by Dr. Rolf Leonhard, Executive Vice-President Engineering Diesel Systems, at the 60th Automotive Press Briefing in Boxberg, June 2011

## How to get there

As far as 'modalities' are concerned we want to make the following points:

- For 2020, we would like to see the weight parameter changed to footprint, and the slope should also be adapted at least to account for technical progress. Our 2011 'How clean are Europe's cars' report demonstrates that distributional effects of such a change are minor;
- Supercredits, eco-innovations and credits for flex-fuel cars are phased out in the current regulation and that should remain the case, otherwise it means the 2020 target is weakened. Keeping eco-innovations also sends a wrong signal towards the development of the test cycle that is supposed to capture as many technologies that contribute to fuel efficiency as possible;
- Assuming that CO<sub>2</sub> standards continue to deliver and drive innovation, beyond 2020 new types of powertrains are expected to hit the market in significant numbers, making the current 'tailpipe CO<sub>2</sub>'-based rules potentially obsolete. Therefore lifecycle emissions of both the energy and the vehicle should be closely studied to enable a better view on how to account for these developments in the future;
- We are against the introduction of 'banking' provisions for the achievement of the 2020 target. The industry will likely 'over comply' with the 2015 target, turning banking into a net weakening of the future target;
- As far as the test cycle is concerned, evidence is mounting that it is just as much the measurement procedures, including for road load, as the drive cycle itself that are to blame for the growing gap between official and real world CO<sub>2</sub> emissions. The revision process is very slow and the Commission could play a bigger and more pro-active role in making a change happen;

## Lorries

For lorries, we want to make the following points:

- The carbon footprint as well as the emissions share of the sector is increasing steadily because of higher growth figures and lower efficiency improvements than have been seen in the case of cars. Action is therefore long overdue;
- The measurement methodology should be robust enough to cover all relevant current and future technological improvements, otherwise it captures only a selection of reduction options rather than all;
- Labelling is relatively more important in this sector than for cars. Therefore both standards and labels are necessary, standards to put a floor in the market and labels to incentivise performance beyond the level of the standard;
- Any standard or label should be capacity-neutral i.e. not give any additional incentive to make lorries bigger or smaller;
- any standard or label should not just include rigid vehicles and tractors, but also trailers. Trailers are very important in the EU market and they have a lot of potential for efficiency improvements.

## Technical comments to EU preparatory work

These comments are based on the report published by TNO on the feasibility and modalities of the 95 g/km target for cars for 2020<sup>5</sup> and on the TNO presentation on on-going work on vans and CO<sub>2</sub> at the European Commission's 6 December stakeholder meeting.

### Focus should be on benefits as well as costs

Our main concern is that the report focuses almost exclusively on costs, which makes us concerned that the Commission is less serious in preparing work to underpin the benefits (see next section).

### Additional cost estimate scenarios are welcome, but should be used throughout

The report, for the first time, is not exclusively based on a set of cost data delivered by industry, but includes additional scenarios that a) transfer findings from the US EPA to the EU situation and b) highlight 'alternative accounting for progress' over the 2002-2009 period. We believe that the scenario based both on EPA data and including analysis of 'alternative accounting', i.e. Scenario C, is the most credible of the scenarios studied, particularly given historic overestimation of compliance costs.

As such we are not surprised that this scenario shows ex-ante compliance cost estimates of reaching 95 g CO<sub>2</sub> /km at €760 per vehicle which is well below previous estimates, and has a quick payback through fuel savings.

However, the report in many places still uses results from the scenario in which industry data are used as the main scenario, for example when retail price effects are estimated. It is important to take more realistic scenarios into account in all areas studied.

### Maximised use of testing flexibilities should not be rewarded

The 'alternative accounting for progress' scenario describes roughly 10% of reductions of CO<sub>2</sub> in past years as 'unexplained'. If, as hinted at by the report, these 'reductions' are on paper only and have been achieved by maximizing flexibilities in the testing process, there is a danger of rewarding the industry for failure to deliver the real reductions implied by the law.

When legislators set the 95 g/km target they did so in order to reduce CO<sub>2</sub> emissions of cars by 40% compared with 2007 levels. In order to keep this overall environmental effect, the 'missing grammes' should be used to tighten the 2020 target. 10% of unexplained progress represents roughly 15 g/km, which is another justification to have a 2020 target at 80 g/km, not 95.

### Preparation for a 2025 target

We are concerned that the EU doesn't even seem to have considered a 2025 target. America has undertaken analysis and found targets to be cost effective. We see no reason the EU should lag behind.

### More work needed on effect of light-weighting

We are disappointed that the report does not quantify the cost savings that would occur from a more comprehensive use of lightweighting strategies as a result of a shift to footprint-based standards. The report still makes it look like weight- and footprint-based CO<sub>2</sub> standards lead to similar outcomes in terms of compliance costs. This is simply not correct. At the 6 December

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<sup>5</sup> TNO et al., Support for the revision of Regulation (EC) No 443/2009 on CO<sub>2</sub> emissions from cars, November 2011, [http://ec.europa.eu/clima/policies/transport/vehicles/cars/docs/study\\_car\\_2011\\_en.pdf](http://ec.europa.eu/clima/policies/transport/vehicles/cars/docs/study_car_2011_en.pdf)

stakeholder meeting TNO presented additional evidence of such cost savings. Although we believe these estimates are still very cautious, it is better to put them in the report than to leave them out.

### **Rebound analysis contains a factual error**

In the analysis of the 'rebound effect' TNO wrongly uses fuel price elasticities, which leads to too high rebound effects. We don't dispute that fuel price elasticities are significant, as the main response to fuel price increases is the choice of a more efficient car. But this is exactly the reason fuel price elasticities cannot be used if the more efficient car is an input, not an output, of the analysis.

### **Van CO<sub>2</sub> baseline highly questionable, suggesting data problems when targets were set**

We are shocked by the finding that the 2010 baseline for average CO<sub>2</sub> emissions from vans now turns out to be 181 g/km, meaning vanmakers only have to cut their emissions by 3% to hit the 2017 target of 175 g/km. The assumption on which the legislation was based was that 2007 average emissions were 203 g/km. We do not believe that the reduction from 203 to 181 g/km between 2007 and 2010 is largely due to technical progress. If indeed it is confirmed that the 2007 baseline was wrong in retrospect due to incorrect data, the Commission should revise the politically agreed targets downward.

### **What the impact assessment should include**

We encourage the Commission to take forthcoming work by the International Council on Clean Transportation (ICCT) on expected compliance costs into account.

For the time being we believe the best scenario available to base the impact assessment on is Scenario C of the TNO report as we strongly believe it is the most credible of the three scenarios studied (see above);

But crucially, the impact assessment should study the benefits in much greater detail than in the past. In the past, only CO<sub>2</sub> emissions reductions, average fuel savings and total reductions in oil imports were quantified. We believe that needs to be improved, especially because in the current economic climate balance-of-payment issues and job creation are such crucial parameters.

Essentially a regulation to reduce CO<sub>2</sub> emissions from vehicles replaces spending on oil imports with spending on low carbon technology. This has important effects on oil prices, balance of payments, and job creation, all of which should be assessed.

### **Impacts on oil prices**

More fuel efficient cars cut oil use which means oil prices will also be lowered. T&E commissioned a study into this effect and found significant results<sup>6</sup>. Lower oil prices have economic benefits for the entire EU economy (not just transport), particularly as gas contracts are typically also linked to oil prices.

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<sup>6</sup> The impact of lower oil consumption in Europe on world oil prices, Enerdata, February 2009, [www.transportenvironment.org/Publications/prep\\_hand\\_out/lid:531](http://www.transportenvironment.org/Publications/prep_hand_out/lid:531)

## **Economic impacts of lower oil import from lower volumes and lower prices**

2011 is expected to become the first year with average oil prices above \$100/barrel. The EU is expected to import \$402bn, or €300bn, worth of oil in 2011<sup>7</sup>. The latest IEA World Energy Outlook expects oil prices to surge to \$150/barrel in the short to medium term. The EU is set to overtake the US as the world's biggest oil importer by 2015. Simply put, with greater efficiency, more money stays in Europe and less flows out. We expect the Commission to quantify the economic effect of this difference in the quality of spending.

## **Jobs**

As these regulations replace spending on oil with spending on low carbon technology, some job losses in the oil industry can be expected, and job creation in technology development and the vehicle supply business. Eurostat data reveal that the oil industry is very capital intensive but not labour intensive. The 'upstream' (i.e. exploration and production) business creates about 2 jobs per €1m added value (for exploration and production in Europe that is). Downstream (i.e. refining and retail) the oil industry creates about 4 jobs per €1m. Contrast this with the supplier industry, the most important beneficiary of the legislation. Again according to Eurostat figures this sector creates about 20 jobs per €1m value added on average. The net effect of a €1m displacement of value added from oil to car industry suppliers would then be in the range of 16-18 jobs created. We expect the Commission to further refine and improve this analysis.

## **Most people buy second-hand, not new cars**

Analysis of UK data reveals that three out of every four car buyers buy second hand. Most people are simply not affluent enough to buy a new car. Data also reveal that after three years, typically two thirds of a car's value is written off, while only one third of its life mileage has been reached. Put differently, second hand car buyers typically pay only a minor share of the costs of fuel saving technologies but still reap a major share of the fuel cost benefits they offer – quite contrary to the car industry's claims that driving would become unaffordable. In other words, fuel efficiency standards help alleviate fuel poverty without imposing a significant cost burden on most car buyers. The Impact Assessment should contain an analysis of the impact of the regulations on regular EU citizens i.e. second hand car buyers.

## **Impacts on EU countries with high imports of second hand cars**

What is true for average citizens is just as well true for most Central and Eastern European countries – they buy most of their cars second hand. Previous Impact Assessments were based on statistics of western countries, while in reality the 'end life' in Western Europe is the start of a new life in Eastern Europe. We expect the assessment to take a special look at the 'new' member states too.

[www.transportenvironment.org/cars-and-CO2](http://www.transportenvironment.org/cars-and-CO2)

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<sup>7</sup> <http://www.ft.com/intl/cms/s/0/106fbec2-18fe-11e1-92d8-00144feabdc0.html#axzz1g8yCSPM3>