EUROPEAN PARLIAMENT

REPORT

Policy Department
Economic and Scientific Policy

WORKSHOP

on

C02 reductions from passenger cars

Brussels, 3 December 2007

IP/A/ENVI/WS/2007-6

PE 393.512

This workshop was requested by the European Parliament's Committee on the Environment, Public Health and Food Safety

Only published in English.

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Manuscript completed in November 2007.

Workshop: C02 reductions from passenger cars, 21 November 2007, European Parliament, Brussels

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SUMMARY

Opening of the workshop

Chris Davies MEP rapporteur of the EP's committee on the Environment, Public Health and Food Safety opened the workshop and welcomed the participants.

Summary of individual presentations

Presentation of the short study 'CO2 reductions from passenger cars' (John Stans, Tauw)

The Tauw study consists of the following elements: a summary of relevant research, an overview of the points of view of stakeholders (car manufacturers, environmental organisations, general public) and an independent assessment about the possibility to reduce CO2 emissions from passenger cars. The main conclusions are:

- Given the state of the art of today's car technology, it is possible to meet the target of 120 g CO2/km. For small cars this target is possible by optimisation of the engine, for larger cars some form of hybridisation is necessary. An interesting development is in cars that use light materials to bring down the weight of the car. This can lead to an emission factor far below 120 g/km. The use of biofuels can be an interesting option for further reduction of the emission factor, but will unlikely be able to have a significant contribution in the short run (2010 - 2015). A significant use of biofuels (10 - 20 %) might be possible in 2020 - 2030. For large scale application of biofuels however attention is necessary for the development and application of sustainability criteria like Green House Gas balance, food competition, biodiversity and deforestation.
- Engine improvements lead to higher retail costs of the car. This increase of costs will however be more or less compensated by the savings on fuel due to higher engine efficiency.
- Implementation: the target of 120 g/km is not likely to be reached in 2012, 2015 however is considered to be a feasible target year.

Expert panel presentations: the view of different stakeholders

Car industry: Graham Smith (Senior Vice President External & Environmental Affairs of Toyota Motor Europe, President of the SMMT (Society of Motor Manufacturers and Traders), Chair of the Board of The Low Carbon Vehicle Partnership):

- An integrated approach is needed to bring down CO2 reductions from passenger cars: car innovation, traffic improvement and eco-driving.
- Toyota, like the European Parliament, has a preference for legislation rather than a voluntary commitment. Toyota likes the same rules being applied to everybody.
- On the target date, Toyota argues for a further three years to 2015 (major change of car models every 4 - 7 years, hence 2012 is too early).
- Toyota prefers weight as the utility parameter.
- Toyota welcomes CO2-based car taxation as a means to stimulate environment friendly vehicles.

Environmental organisations: Jos Dings (Director of Transport & Environment):

- Transport & Environment (T&E) emphasises that the target of 120 g CO2/km was originally (in 1995) set for 2005. Implementation in 2015 means therefore a 10 years postponement.
- Efficiency evolution has almost come to a standstill, progress in recent years is very minimal (2004 - 2006: 163 -160 g/km).
- T&E stresses the importance of fuel efficiency and refers to the recently published and rather alarming Energy World Outlook 2007 of the International Energy Agency (IEA): in view of the growth of countries like China and India oil shortages might possibly occur in the upcoming ten years. Oil shortages might lead to an increased use of more polluting fossil fuels (tar sands, coal).
- 120 g/km in 2012 is possible against very low costs (only 19 Euro per tonne CO2 avoided, an increased use of biofuels would cost 158 Euro per tonne CO2, both figures come from the Impact Assessment of the European Commission, February 2007)
- The weight of the car is the most important factor for its fuel consumption and CO2 emission.
- T&E sees the use of a utility parameter (or class parameter, a parameter that makes different emission standards for different car classes possible) only as a temporary measure. Their fundamental belief is that emission standards should be independent of car class according to the principle 'the polluter pays'. A temporary utility parameter should avoid incentives that make CO2 lowering more difficult. For that reason a weight based utility parameter will not do: it only works counterproductive, it rewards car makers for making cars heavier and therefore lead to higher CO2 emissions. Weight parameters did not work abroad (US, Japan). A parameter based on the footprint (wheelbase x track width) of the car (as being used now in the US for some vehicle types) works out better, it stimulates car makers to bring down the weight of the car and is in that way more effective for bringing down its CO2 emissions.

Research: Richard Smokers (CE Delft, formerly TNO Automotive; two Dutch research institutes):

- The presentation of Richard Smokers focussed on the possibility to bring down the emission factor from 160 g/km (actual situation in 2006) to 130 g/km in 2012.
- The main conclusion is that the technology (engine improvements) is available to make this reduction possible. Only for large petrol cars hybridisation is necessary to reach 130 g/km, for cars in other segments engine improvements alone will do.
- Smokers emphasised that possible market trends need to be compensated (the autonomous increase of average car weight and performance and the shift to larger segments (SUVs)). Weight is crucial.
- Increased retail prices are exceeded by savings on fuel. 130 g/km is cost effective at consumer level without reduction of car comfort and performance.
- The period until 2012 to reach 130 g/km is short, but manufacturers seem to have increased pace.
- Flanking policies such as consumer stimulation, CO2-based taxes and improved labelling can help to achieve required sales of fuel efficient vehicles.

Discussion

- Chris Davies wondered why car makers don't enter the market with low emitting cars when the technology is there and when it can be done cost neutrally. Jos Dings and Richard Smokers pointed out that the main reasons for this is the focus of consumers on the retail price of a car, possible savings on fuel over the car lifetime are not taken into consideration when buying a car. Competition between car manufacturers is retail price based.
- A representative from ACEA doubted the statement that the switch towards cars with an emission factor of 120 g/km can be done more or lest cost neutrally, referring to the penalty T&E proposes in one of its reports (150 Euro per g/km CO2 'overshoot' per car). Jos Dings pointed out that penalties might be part of future legislation but are not taken into account when judging cost neutrality. The 19 Euro per tonne CO2 avoided as mentioned in the Impact Assessment of the European Commission is the relevant figure. These costs are low compared to the costs of the increased use of biofuels (158 Euro per tonne CO2 avoided).
- A representative from the European Hydrogen Association pointed out the possibility to lower the CO2 emissions of cars by the increased use of hydrogen. All panel members agreed that hydrogen might be an interesting option for the long term. For the short term however the focus should be on increasing fuel efficiency. There should also be attention to the CO2 emissions related to the production and transport of hydrogen when it might become a major fuel for passenger cars.

ANNEX I

Presentations

Directorate-General for Internal Policies
Directorate A - Economic and Scientific Policy
Policy Department A.: Economic and Scientific Policy Unit

Tauw

WORKSHOP
CO2 reductions from passenger cars

European Parliament, Altiero Spinelli Building ASP A 1-G-2, Brussels
Wednesday 21 November 2007, 12:30-14:00 hrs.

12:30 Welcome and opening – Rapporteur Chris Davies MEP

12:40 Presentation of the short study 'CO2 reductions from passenger cars ': John Stans (Tauw)

Expert panel presentations: the view of different stakeholders

13.00 *Car industry:* Graham Smith (Senior Vice President External & Environmental Affairs of Toyota Motor Europe, President of the SMMT (Society of Motor Manufacturers and Traders), Chair of the Board of The Low Carbon Vehicle Partnership.

13.10 *Environmental organisations:* Jos Dings (Director of Transport & Environment)

13.20 *Research:* Richard Smokers: (CE Delft, formely TNO Automotive; both are Dutch research institutes):

13.30 Discussion

13.55 Concluding remarks by Chris Davies MEP

14.00 End of workshop

Venue: European Parliament – Altiero Spinelli Building ASP A 1-G-2
Brussels, Rue Wiertz 60 (main entrance)

Participation in the workshop is free of charge and open to all, but **prior registration** (via the reply form, preferably by email) is **required** and should be done **before Wednesday 14 November**! For further information, please contact:

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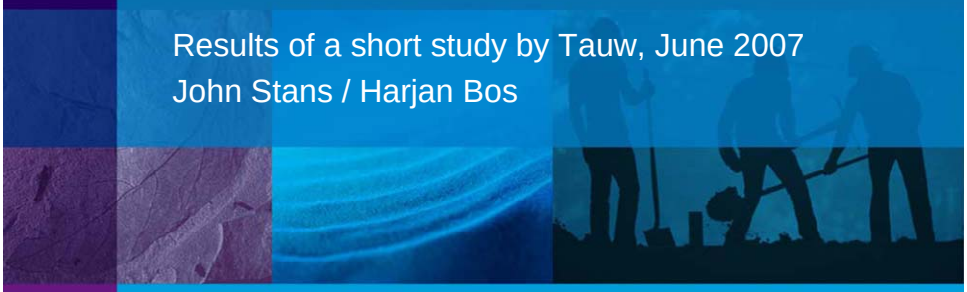
CO_2 Reductions from Passenger Cars

Results of a short study by Tauw, June 2007

John Stans / Harjan Bos



Tauw

Introduction

- Road transport is biggest source of GHG emissions in the EU after power generation
- Contribution from road transport: 20%
- Contribution from passenger cars alone: 12%
- Road transport emissions still increase: 26% from 1990-2004.

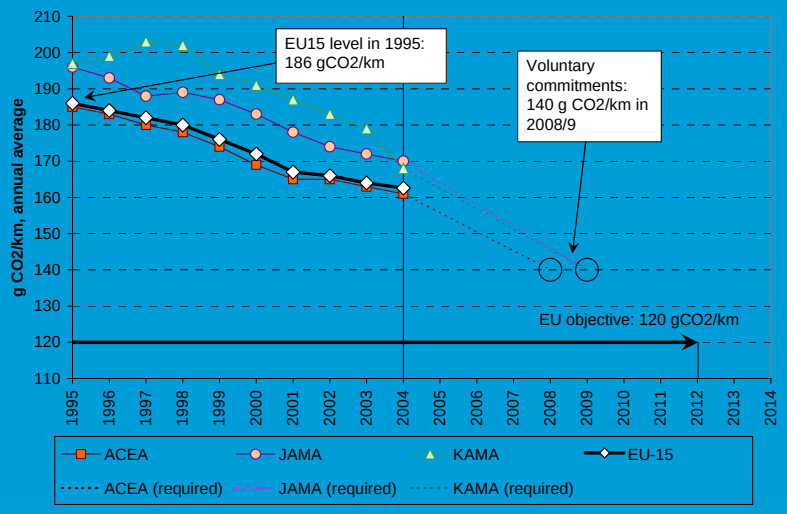
Tauw

Existing strategy

- Target for 2012: CO_2 emissions from passenger cars in EU: 120 g CO_2 /km through:
  - Voluntary reduction to 140 g/km by 2008/2009
  - Raising awareness among consumers
  - Promotion of fuel efficient cars (fiscal measures)

Tauw

EU 15 average new car fleet CO_2 emissions between 1995 and 2004 (EC 2007)



Tauw

Proposed revised strategy (February 2007):

- EU legislation to reduce CO_2 emissions to 120 g CO_2 /km by 2012
  - Reduction to 130 g/km by improved motor technology
  - Reduction of 10 g/km extra by additional measures: efficiency improvements for components such as tyres and air conditioning, reduction of carbon content in road fuels
- Vans: reduction to 175 g/km by 2012 and 160 g/km by 2015.
- Support for research efforts aiming at emission of 95 g/km by 2020.
- Promotion of fuel efficient cars by labelling and road tax based on CO_2 emissions
- Code of good practice on car marketing

Tauw

Scope of the short study by Tauw

- Independent assessment:
  - Feasible reduction targets: engine, vehicle design technology, costs
  - Potential cost savings for consumers due to lower fuel consumption
  - Environmental benefits due to less CO_2 emissions
- Approach
  - Summary of relevant research
  - Overview of points of view of stakeholders
  - Independent view

Tauw

Summary of relevant research

- TNO:
  - Cost increase for CO_2 reduction to 140 g/km in 2008: Euro 1200
  - Additional cost increase for further CO_2 reduction to 120 g/km in 2012: Euro 2450
- UBA:
  - Lower cost increases expected

Tauw

Views of stakeholders

- Car manufacturers:
  - CO_2 reduction by vehicle technology least cost effective
  - Better options:
    - Biofuels
    - Ecodriving

Option:	Savings (Mtonnes CO_2/yr)
1% biofuels:	3.1 to 4
5% biofuels:	15.5 to 20
Vehicle technology (120 g/km)	14.4
Ecodriving:	7.8
Infrastructure: ?	

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Views of stakeholders

- Environmental organisations:
  - Voluntary approach fails
  - Emissions trading and biofuels are no alternatives to technology
  - 120 g/km is feasible with existing technology but including stopping negative trends
  - Need for offering longer term targets
  - Some brands are on track, others are not!

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Views of stakeholders

- General public (sample taken may not be representative):
  - Willingness to pay extra for lower CO_2 emissions

Tauw

Assessment

- Technical: 120 g/km as average is feasible
  - Motor technology improvements feasible
  - Car weight reductions
  - Hybridisation
- Biofuels:
  - Increase from 0.3% in 2000 to 5.75% (target) in 2010
  - Can become more significant in 2020-2030 (10 to 20%)
  - Fuel Quality Directive of importance
  - Sustainability criteria to be considered

Tauw

Assessment

- Cost consequences:
  - Cost savings on fuel more or less compensate the increase in retail price
- Environmental consequences:
  - Benefits
    - Slowing down of climate change
    - Slowing down of depletion of fossil fuel reservoirs
  - Point of attention:
    - Large-scale application of biofuels in need of sustainability criteria: GHG balance, food competition, biodiversity, deforestation

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Implementation issues

- Target year: 2012 is unlikely, 2015 more feasible
  - Slow progress of reaching 140
  - 7 year production cycle.
- Provide clarity about targets, both short and long term, to facilitate investment strategies and research
- How to divide efforts among manufacturers?
- Are sanctions appropriate if targets are not met?
- Influence consumer behaviour: financial benefits / taxes.

Tauw

TOYOTA's stance on the EU's CO_2 strategy

Graham Smith
Senior Vice President External Affairs & Environmental Affairs
Toyota Motor Europe

TOYOTA

Agenda

1. Toyota in Europe
2. CO_2 140 Voluntary Commitment
3. Post CO_2 140
4. Conclusion

TOYOTA

Toyota - in Europe

- Began selling cars in 1963
- Over €6 billion invested since 1990 in manufacturing, sales, parts and logistics networks as well as R&D, Design and Formula One.
- Over €5 billion/year spent with European suppliers each year
- 1,124,000 vehicles sold in 2006
- 5.8% market share in 2006

TOYOTA

Pan-European operations

Head Office:
Brussels, Belgium

28 National Marketing and Sales Companies (NMSCs)
2,884 Sales Outlets

TOYOTA

European production: “operating at full capacity”

Around 70% of Toyota’s sold in Europe are made in Europe

TOYOTA

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3. Post 140g CO_2
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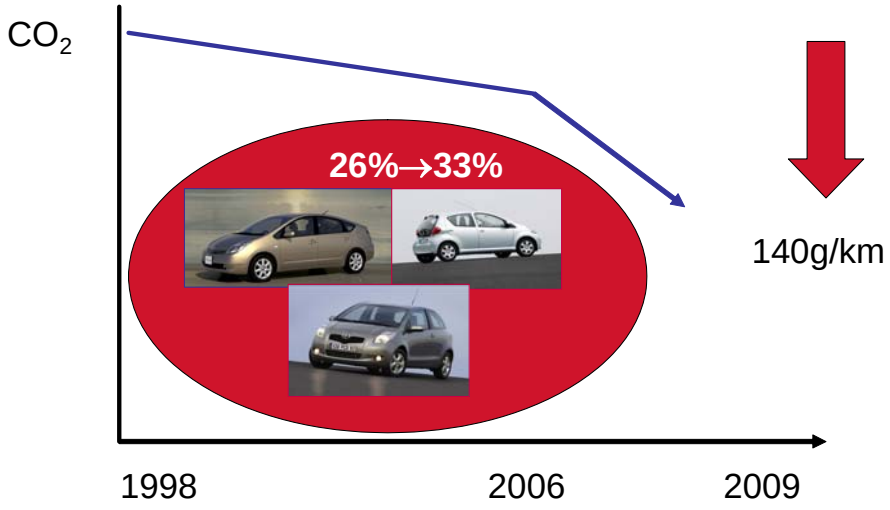
CO_2 140 g/km - voluntary commitment



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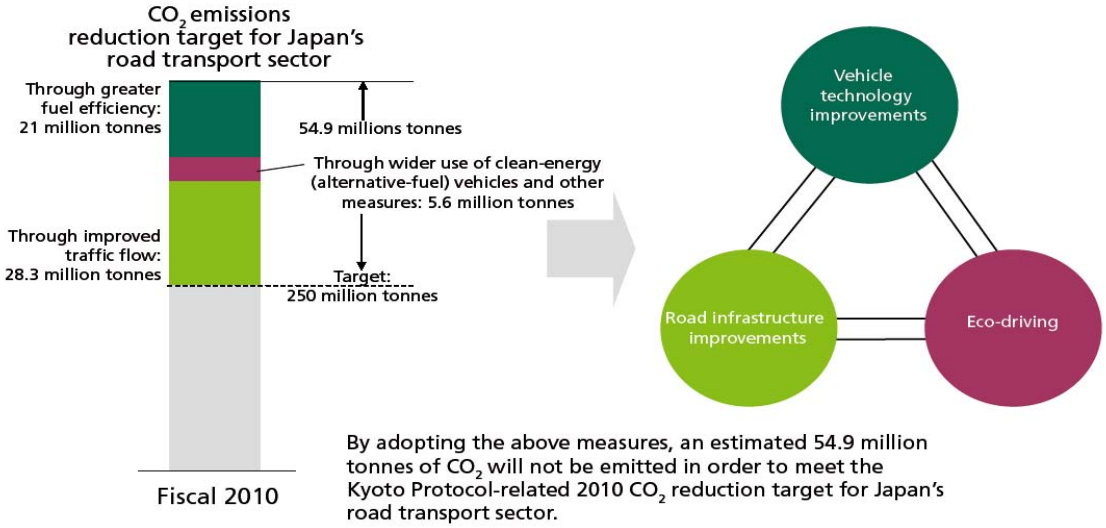
Post CO_2 140 g/km – integrated approach

An integrated, "three-in-one" approach is required.



By adopting the above measures, an estimated 54.9 million tonnes of CO_2 will not be emitted in order to meet the Kyoto Protocol-related 2010 CO_2 reduction target for Japan's road transport sector.

TOYOTA

Post CO_2 140g - Toyota stance

Item	Expected proposal	Toyota
Legislation	Regulation	Same for everybody
Target date	2012	Postpone
"Utility" parameter	TBD	Weight
Complementary measures	10g/km	> 10g/km
Infrastructure & eco-driving	Not complementary measure	To be included
Group average	Yes	Flexibility
N1 vehicle	Separate standards	Separate

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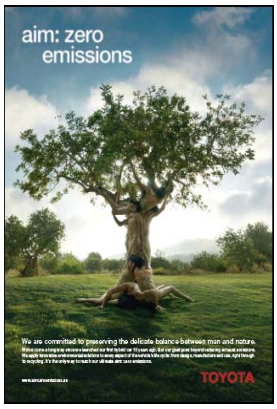
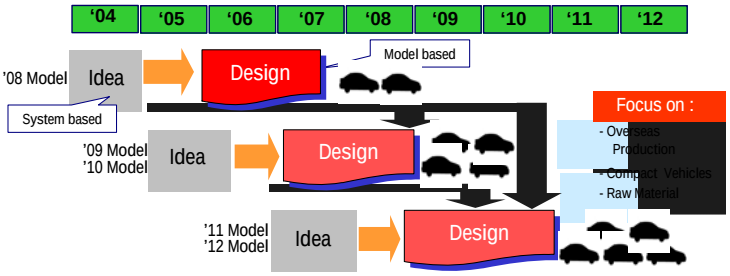
Post CO_2 140g – target date





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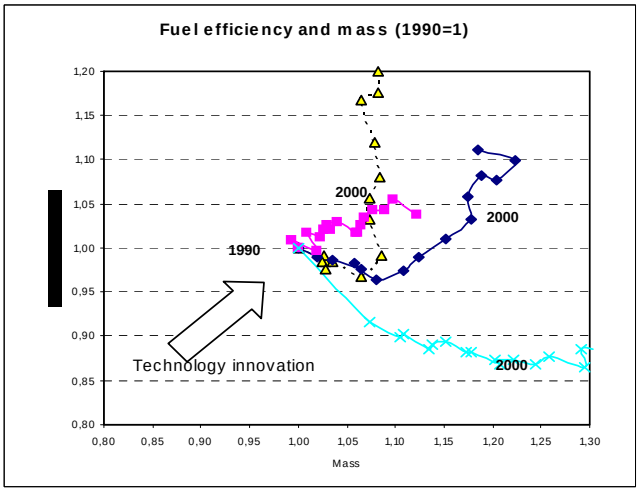
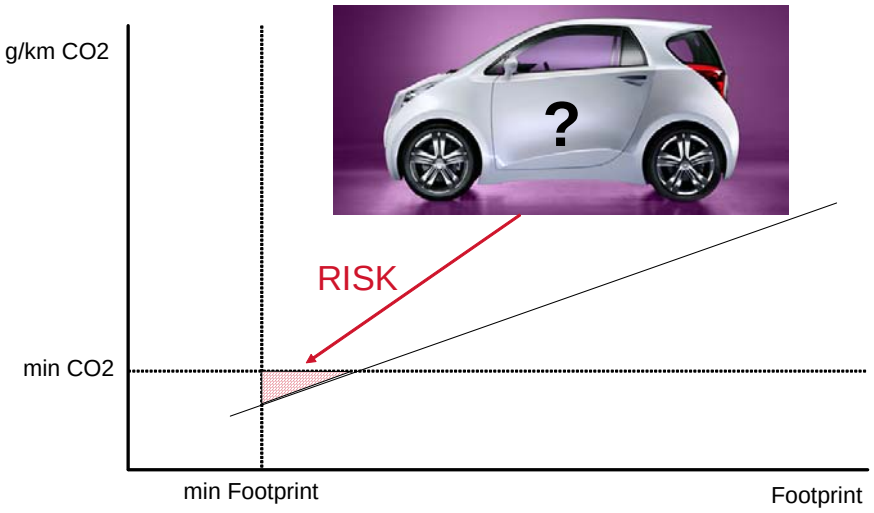
Post CO_2 140 g/km – utility parameter



While Europe and the USA increased average mass of their fleet, Japan increased fuel efficiency at constant mass

TOYOTA

Post CO_2 140 g/km – utility parameter



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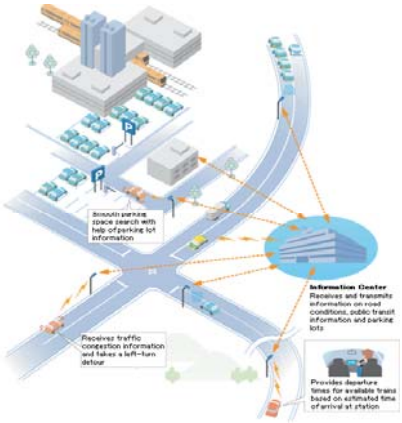
Post CO_2 140 g/km – include infrastructure



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Post CO_2 140 g/km – include eco-driving

Schneller schalten – weiter kommen

Country	Training Program Result	Participation level
Finland	· Average fuel-efficiency increase for ordinary drivers was12.5-13.5% · For professional drivers, the fuel efficiency increase was 8～9%.	Approx. 10,000 people (% of 3 million licence holders: 0.3%)
Switzerland	· Fuel efficiency increase of 12%or more.	Approx. 1,000 people (% of 4 million licence holders: 0.3%)
Germany	· A result of the order of 25% fuel efficiency improvement.	Approx. 3,000 people (% of 5 million licence holders: 0.6%)
Netherlands	· CO_2 reduction result 222.5kt	N.A .

(Source) JAMA/ Foundation for Promoting Personal Mobility and Ecological Transportation

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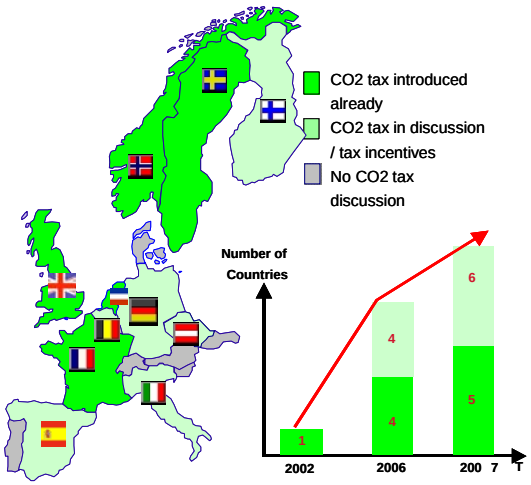
Post CO_2 140 g/km – include CO_2-based car taxation



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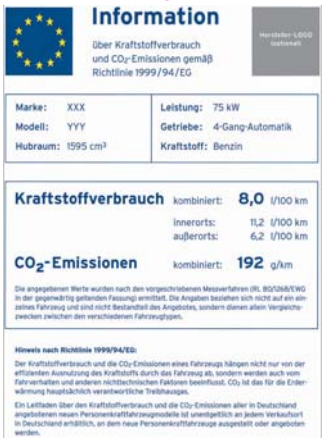
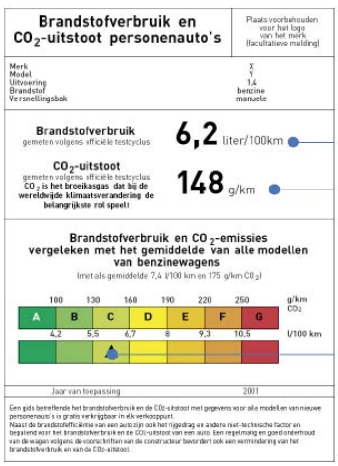
Post CO_2 140 g/km – include CO_2 labelling

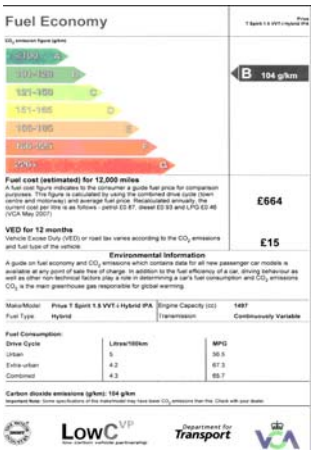
Germany



Belgium



UK



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Post CO_2 140 g/km – exclude N1 vehicles

Potential	Challenge
	 

?

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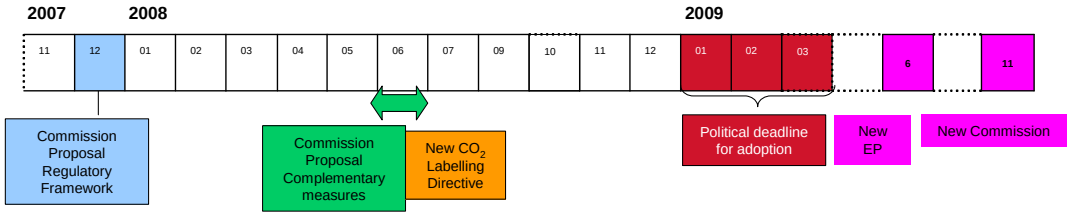
Post CO_2 140g – legislative timetable



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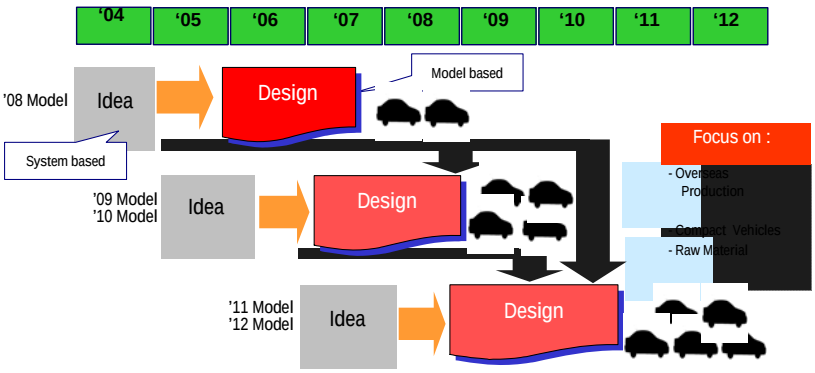
Post CO_2 140g – target date



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Agenda

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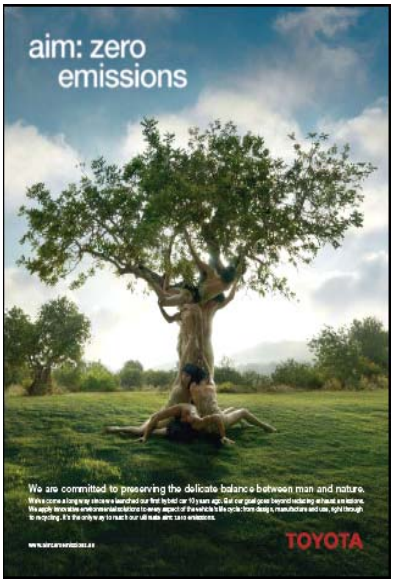
Conclusion



TOYOTA

Thank you

TOYOTA

Reducing CO2 emissions from cars

Jos Dings, Director, T&E

European Parliament, 21 November 2007

www.transportenvironment.org

T&E membership

Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovenia, Spain, Sweden, Switzerland, UK

49 Members – 21 Countries

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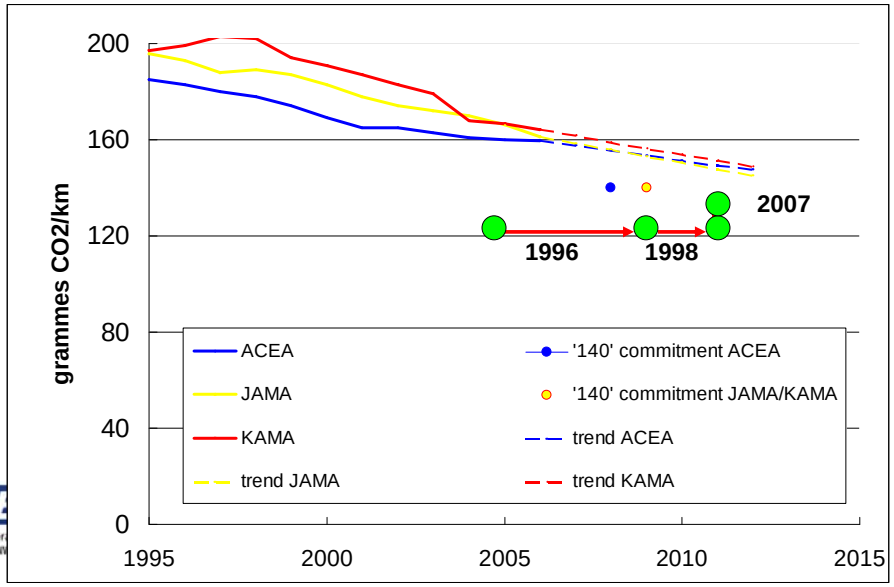
Efficiency evolution has come to almost standstill – and targets postponed



Efficient cars bring:

To society:
slower climate change
lower oil market pressure – lower oil prices
→ lower gas prices too
→ much lower import bills (quantity AND price)
→ less coal use in power plants
→ less 'unconventional' oil

to consumers: fuel cost savings, not just in transport

to business: technology development – Lisbon !

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‘120 by 2012’ perfectly feasible

- impact assessment: 120 g/km by 2012 would only cost €19 per tonne of CO2 !!
- although it assumes cars will keep on gaining weight over time (NO lower carbon specifications)
- although it ignores learning effects

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Long term targets !!

- Absolute necessity from industry, climate and energy policy point of view
- 5% p.a. improvement: 80 g/km by 2020, 60 g/km by 2025
- ACCEPT THAT TECHNOLOGICAL UNCERTAINTIES EXIST !!
- Don’t let impact assessment ‘tyranny’ hijack strategic policy making

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Ranking of CO2 'progress' in 2006 and role of weight increase

Company	average CO_2 emissions (g/km)			average weight (kg)		
	2005	2006	%	2005	2006	%
Toyota	161	153	**-5.0%**	n/a	n/a	
Honda	160	154	**-3.8%**	n/a	n/a	
PSA Peugeot Citroën	146	142	**-2.7%**	1291	1282	**-0.7%**
BMW	188	184	**-2.5%**	1540	1537	**-0.2%**
Mazda	177	173	-2.0%	n/a	n/a	
Nissan	171	168	-1.6%	n/a	n/a	
Hyundai	168	167	-0.8%	n/a	n/a	
Renault	148	147	-0.8%	1294	1294	0.1%
Fiat	145	144	-0.5%	1150	1190	3.5%
Ford	163	162	-0.5%	1378	1393	1.1%
General Motors	157	157	-0.3%	1309	1336	2.1%
Volkswagen Group	165	166	**0.9%**	1444	1460	**1.0%**
Suzuki	164	166	**1.8%**	n/a	n/a	
DaimlerChrysler	182	188	**2.8%**	1499	1561	**4.1%**

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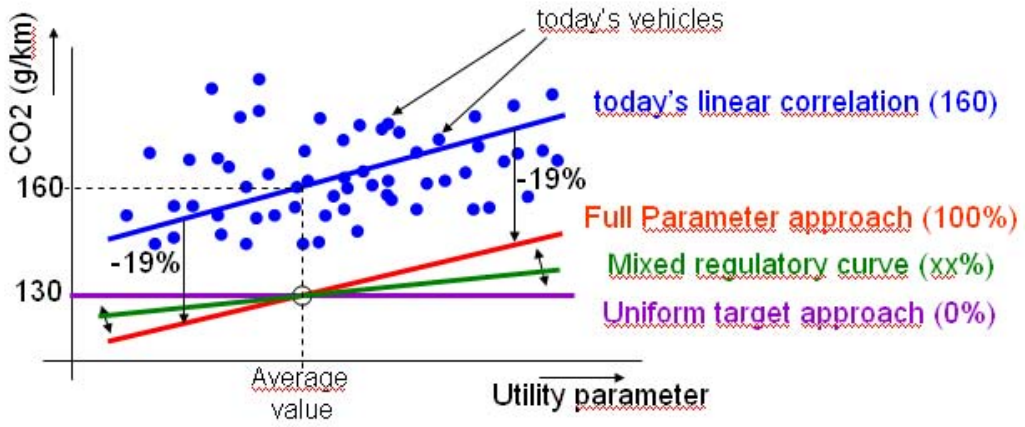
- Source: T&E/IEEP on basis of European Commission data

Utility-based standard



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The choice of utility parameter - why we should NOT base CO2 standards on weight

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www.transportenvironment.org

Weight based CO2 standards are counterproductive

- The failure to reduce weight is one of the most important reasons why CO2 has not gone down quickly enough
- Weight based CO2 standards punish weight reductions with stricter standard – even if standard curve is relatively ‘flat’
- This reduces environmental effectiveness, pushes up compliance costs, or both

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Weight based standards have not worked abroad

- US: awareness that weight-based standards have failed (28% increase in vehicle weight 1987-2007)
- US changed to ‘footprint’ (~ interior space) based standards
- Japan has not been the smashing success story: car weight increased by 15% for small ‘kei’ cars, and by 4% for normal cars in 1998-2006

T&E European Federation for TRANSPORT and ENVIRONMENT

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They will lead to more traffic fatalities

- US: ‘*weight reduction would be expected to decrease the overall number of fatalities’* (i.e. heavier cars are more dangerous)
  - More damage to other road users
  - More rollovers
- Footprint-based standards address both negative effects

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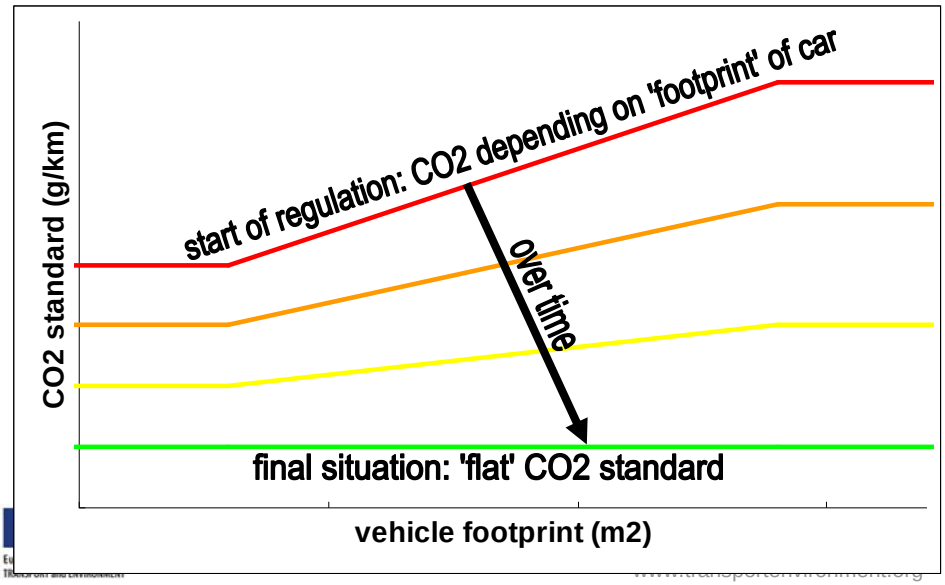
Addressing the ‘Smart’ issue under footprint-based standards



Ensuring compliance

Credibility

- Ambitious targets + weak compliance mechanism = business as usual !
- Compliance should NOT be achieved through access to external credits or compensation schemes

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On penalties

- In a penalty-based system the penalties should be high enough to ensure compliance
- €150 per g/km CO2 per car seems appropriate, based on marginal abatement costs
- We do not want car makers to pay, we want more efficient cars !!

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On exemptions

- Many flexibilities will be built in the regulation, unlike Euro 5/6 standards:
  - Fleet-averaging of emissions
  - utility-based standards
  - pooled compliance
- Additional exemptions absolutely unnecessary – niche manufacturers are well able to pass on costs

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To do list

- 120 by 2012, 80 by 2020, 60 by 2025
- No weight based standards ! Rather footprint, or better: flat
- Dissuasive penalties – it is not a tax, it is a regulation
- Exemptions unnecessary – there are enough flexibilities

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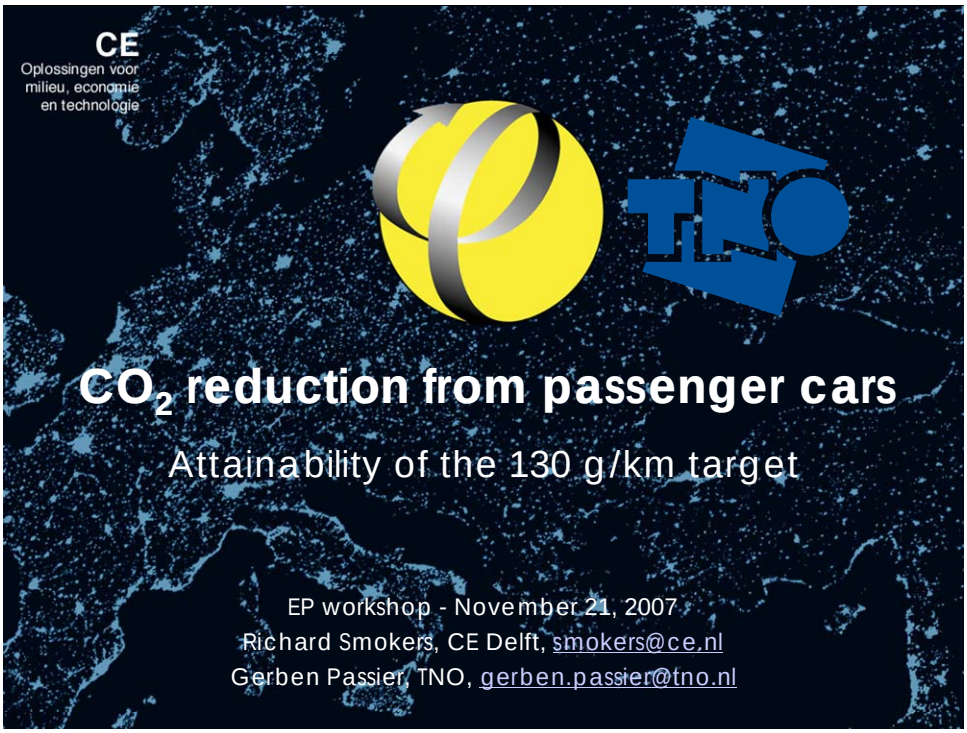
CE
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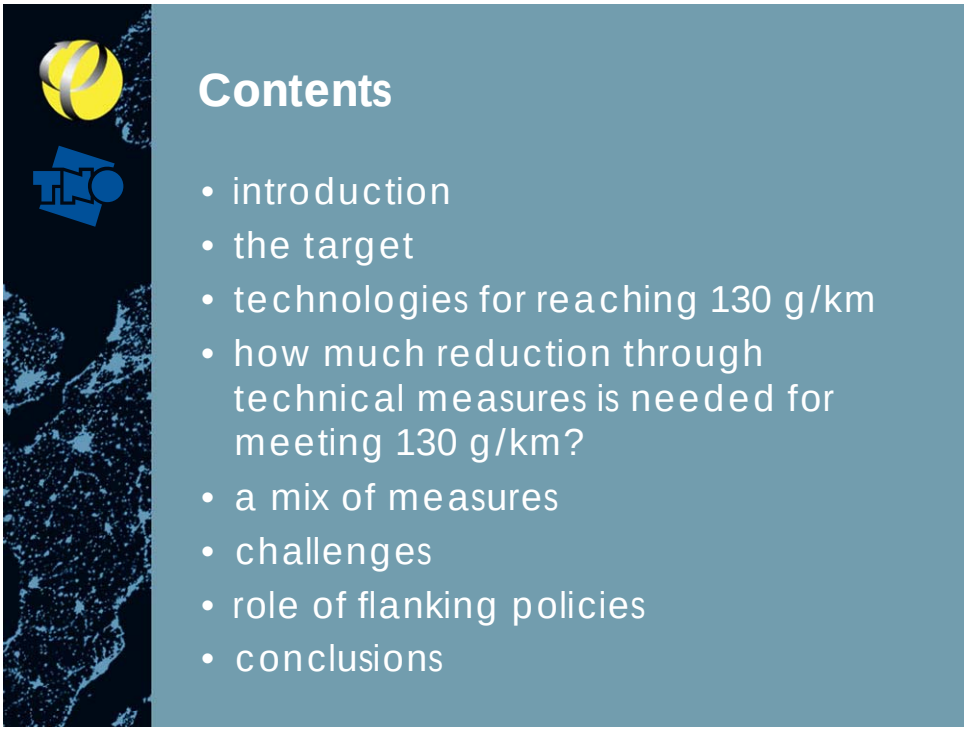
CO_2 reduction from passenger cars
Attainability of the 130 g/km target
EP workshop - November 21, 2007
Richard Smokers, CE Delft, smokers@ce.nl
Gerben Passier, TNO, gerben.passier@tno.nl


Contents
• introduction
• the target
• technologies for reaching 130 g/km
• how much reduction through technical measures is needed for meeting 130 g/km?
• a mix of measures
• challenges
• role of flanking policies
• conclusions

Introduction

- Based on report (TNO 2006):
  - *Review and analysis of the reduction potential and costs of technological and other measures to reduce CO_2 emissions from passenger introduction*
  - Contract SI2.408212 (DG ENTR)
  - by TNO, IEEP and LAT, 2005/2006
    - project leader R. Smokers (now @ CE Delft)
- Independent expert view by CE Delft and TNO

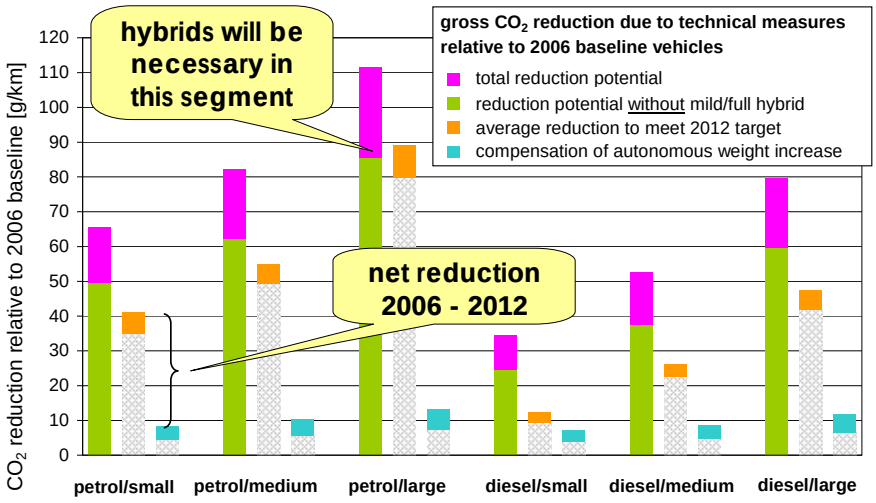
The target

- from: 160 g/km in 2006
  to: 130 g/km in 2012
- assumed implementation
  - sales weighted average target per manufacturer
  - based on some utility-based limit function
- possible market trends need to be compensated:
  - autonomous increase of average weight and performance
  - shift to larger segments: SUVs…

Technologies for meeting 130 g/km

- petrol direct injection
- variable valve timing/control
- engine down-sizing
- optimised gear boxes
- start-stop + regenerative braking
- mild & full hybrid power train
- weight reduction
- improved aerodynamics
- low rolling resistance
- + range of “small” options

Required reductions (rel. to 2006 avg.) to meet overall 2012 target of 130 g/km



- spread in required reductions per segment per manufacturer is higher than spread in average reduction!
  - some need to do more, others less

A mix of measures

- Target can be met by:
  - applying "average" level of CO_2 reduction measures to complete product portfolio
  - selling a sufficiently large share of vehicles with advanced CO_2 reduction measures
    - e.g. full hybrids in higher market segments
  - or a mix of both

  and/or:
  - selling smaller / lighter vehicles with lower performance...

Challenges

- Challenges:
  - have products ready in time
    - product life-cycle
    - product development lead time
      - BUT "Frankfurt" shows that manufacturers can also effectively update existing models
  - at acceptable costs
    - requires economies-of-scale
- Only 4 years to develop and apply required technologies for 30 g/km reduction after legislation has been adopted (2008-2012)
  - BUT approximate targets for 2012 have been known for quite some time already!

Role of flanking policies (1)

- Role of consumers
  - lifetime fuel cost savings for going from 160 g/km in 2006 to 130 g/km in 2012:
    - ≈ € 2,200 @ 1.00 €/litre
    - ≈ € 2,700 @ 1.20 €/litre
    - savings exceed retail price increase
    - for car with same size, comfort and performance
  - however, new car buyers do not perceive full lifetime savings
  - consumers will need to be stimulated to buy fuel efficient cars or smaller / lighter cars

Role of flanking policies (2)

- EU and Member State policies for promotion of fuel efficient cars can help to reach target in time
  - CO_2-differentiation of vehicle tax
  - tax credits for advanced vehicles
  - improved labelling

Conclusions (1)

- 130 g/km is cost effective at consumer level without reduction of comfort / performance
- compared to technical reduction potential the average required reduction for meeting 130 g/km in 2012 is relatively limited
  - but with significant spread in the required reduction per manufacturer

Conclusions (2)

- compared to the 2006 average the remaining reduction is challenging
  - short time period (2008-2012)
  - but manufacturers seem to have increased pace
- flanking policies can help to achieve required sales levels of fuel efficient vehicles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ANNEX II

Short Curriculum vitae

Short Curriculum Vitae John Stans

John Stans is senior consultant and group manager in the Environment and Safety Department of Tauw in Deventer since March 2003

He has 33 years of experience in research and consulting on environmental issues. During this time he has gained experience in hydrodynamics and hydraulics, water quality, water resources management, environmental impact assessment, quality and environmental management, accreditation and certification. Since 1989 he specialised more in environmental management systems, certification, environmental auditing, corporate strategy, and sustainability issues as well as implementation of EU directives in pre-accession countries and new Member States.

John Stans experience includes the development and introduction of environmental management systems and environmental audits across a range of industrial sectors in a number of European countries and also in the United States. As Chairman of the sub-committee on Environmental Auditing, and Member of the subcommittee on EMS, of the ISO Technical Committee (TC207), he is fully involved in international developments in the field of environmental standards and certification including standards for environmental auditors. He was co-editor of the UNEP/ICC/FIDIC 'train-the-trainers' manual on environmental management and author of the UNEP/ICC/FIDIC Guide to ISO 14001 Certification / Registration. These manuals are used world-wide. As a specialist in environmental management he has become a skilled trainer, with target audiences ranging from government officials to management staff and workers in the private sector.
John Stans is an experienced manager of projects in the fields of environmental management, EMAS, environmental action programmes, audits, and environmental impact assessment.

He has been a Member of the Dutch Commission on Environmental Impact Assessment since 1988 and was also a Member of the Steering Committee / Working Group on the implementation of EMAS in the Netherlands.

Graham Smith

Senior Vice-President
External Affairs & Environmental Affairs
Toyota Motor Europe

Graham Smith graduated from Trinity College, Cambridge, with a Masters Degree in Economics and subsequently gained a Diploma in Business Administration from Manchester Business School. He joined Toyota (GB) PLC in 1993 as a Regional General Manager, was subsequently appointed Marketing Director in May 1994 and promoted to the position of Managing Director on the 1st January 1996. He was appointed to his current position as Senior Vice-President, Toyota Motor Europe, responsible for External Affairs and Environmental Affairs on the 1st July 2006. Concurrently he also assumed the new role of Managing Director, Toyota Motor Europe London Office, coordinating efforts in Governmental and External Affairs specifically for the UK market. Prior to joining Toyota (GB) PLC, Graham held a number of senior Sales and Marketing positions with Ford Motor Company.

In January 2003 Graham was invited to Chair the newly established UK Low Carbon Vehicle Partnership (LowCVP) and continues to hold this position. The LowCVP is a partnership of around 250 organisations who are stakeholders at the forefront of initiatives to reduce carbon emissions from road vehicles. Members include representatives of vehicle manufacturers and fuels companies, environmental organisations, road user groups, academic and government bodies. The LowCVP develops initiatives to promote the sale and supply of low carbon vehicles and fuels and provides input and advice on Government policy. The organisation also provides a forum for partners to share knowledge and information.

On the 1st January 2007 Graham was appointed as President of the UK Society of Motor Manufactures and Traders (SMMT). He is also a Fellow of the UK Institute of the Motor Industry.

Born in Cumberland, England Graham and his wife Elaine now divide their time between their homes in Tervuren, Belgium and Horsham in the UK.

Jos Dings is Director of T&E, the European Federation for Transport and Environment. T&E is Europe's principal environmental organisation campaigning specifically on transport issues and draws its 49 member organisations from 21 EU Member States. T&E works on aviation, shipping, standards for cleaner vehicles and fuels, and European infrastructure charging and investment policy. As Director Jos carries responsibility for strategy, staffing, fundraising and external representation of T&E.
Before joining T&E in 2004, Jos worked at CE Delft, an environmental consultancy, where he headed the transport division. Jos is 38 years old, married with three children, and loves bike racing in the mountains.

Dr. Richard T.M. Smokers

Richard Smokers has an extensive track record in technology assessment and policy-oriented studies in the field on transport, energy and environment. Since May 2006 he works as senior consultant for CE in Delft. Between June 1996 and May 2006 he occupied various positions in the Environmental Studies & Testing group at TNO Automotive. Before joining TNO Automotive, Richard Smokers has worked at the Policy Studies department of ECN, the Netherlands Energy Research Foundation.

At ECN and TNO he has been working on a large number of national and international projects in the field of technology assessment of alternative powertrains (electric, hybrid and fuel cell vehicles) and alternative fuels. European projects include UTOPIA, MATADOR (in which he was leader of the Task developing test procedures for electric, hybrid and fuel cell vehicles), Cleaner Drive and FCTESTNET (in which he has led Work Package 1 assessing testing aspects related to the application of fuel cells in transport). In the context of IEA Implementing Agreements Richard Smokers has set up and co-ordinated international projects on environmental impacts of electric vehicles and on hybrid vehicles and has worked in a project on fuels cells for transportation. He also has extensive expertise on the (measurement and modelling of) emissions and energy consumption of conventional vehicles and regularly works as a consultant to the Dutch Ministry of VROM (Environment).

Recently Richard Smokers has worked as a consultant for the European Commission in various projects on the CO_2-emission of passenger cars and vans.