



REDUCING CO₂ EMISSIONS FROM CARS TOWARDS AN INTEGRATED APPROACH

COMBINING EFFORTS TO ACHIEVE LARGER, COST-EFFECTIVE REDUCTIONS

The European automobile manufacturers are fully committed to reducing carbon dioxide (CO₂) emissions from cars and have a credible track record of practical, innovative and affordable solutions. To make further progress, concerted effort is required. Climate change is a complex and global challenge. Singling out the automobile industry will fail to achieve sufficient environmental gains and will put car manufacturing in Europe at risk. The sensible solution is an integrated approach, combining further developments in vehicle technology with an increased use of alternative fuels, intelligent traffic management, changes in driving style and car use, and CO₂-related taxation. This requires partnership between the fuel industry, policy makers, drivers and the automotive industry.

European
Automobile
Manufacturers
Association



ACEA



1 } IMPROVEMENTS
IN VEHICLE
TECHNOLOGY
WILL CONTINUE

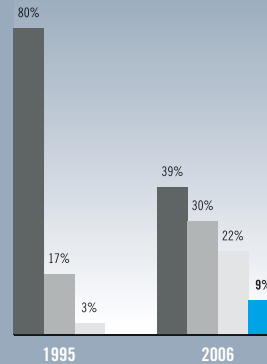
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MULTIPLE SOLUTIONS: A single technological solution to further reducing CO₂ emissions from cars does not exist. Most likely, the future will see a number of technological combinations entering the market, tailored for different usage, driving circumstances and consumer preferences. In the past decade, ACEA members have introduced more than 50 new CO₂ cutting technologies into their vehicles, reducing emissions by over 13%, and many more are in the pipeline. The industry invests € 20 billion (4% of turnover) per year in research and development.

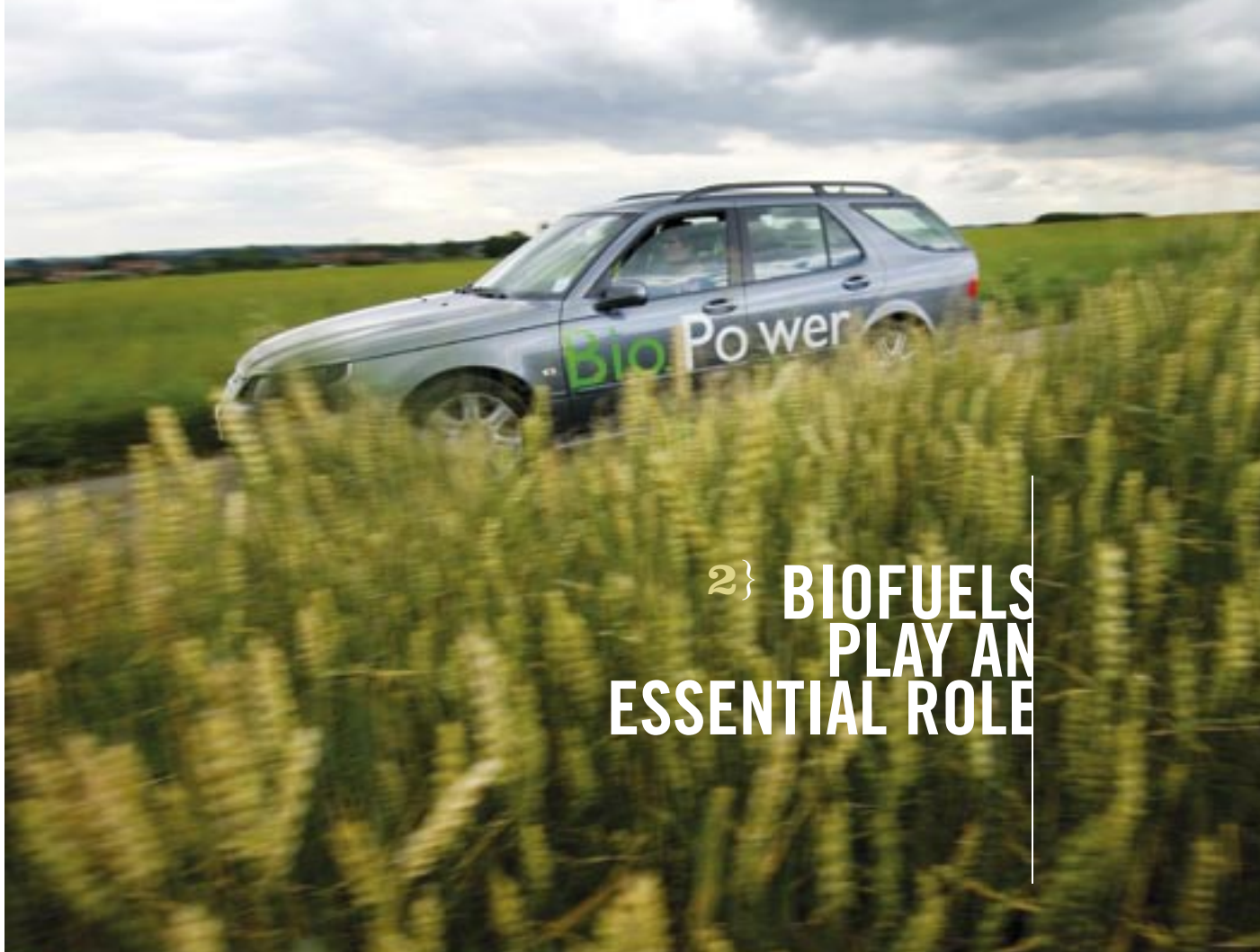
FIELDS OF RESEARCH: Innovations focus on refining conventional engine technologies, improving aerodynamics of cars, reducing rolling resistance and decreasing the mass (weight) of cars. The industry is also developing hybrid vehicles as well as combustion and fuel-cell hydrogen engines in various forms, which will contribute to cutting CO₂ in the long-term future. The use of alternative fuels is another essential development.

On the road to sustainable mobility



Trend in new car CO₂ emissions (g/km)

- 161+
- 160-141
- 140-121
- 120 and less



2} BIOFUELS
PLAY AN
ESSENTIAL ROLE

2



UNDERESTIMATED: Biofuels can significantly help reduce CO₂ emissions from cars. Car manufacturers have developed and adjusted engines for different kinds of alternative fuels and combinations of lubricants. In EU policy, the importance of alternative fuels has long been underestimated. Alternative fuels will have to be developed and made available on a much larger scale.



LABELLING AT THE PUMP: With next generation fuels and higher blending requirements on the way, the automotive industry needs enough time to modify engines to ensure technical compatibility. The industry stresses the need for separate availability of today's fuels at fuel stations for the foreseeable future to ensure older cars run on the fuel for which they were designed. New fuels should be separately labelled and available for tomorrow's vehicles.



**3} CHANGES
IN DRIVING
STYLE WITH
"ECO-DRIVING"**

3



EASY TO APPLY: By slightly changing their driving style, car users can significantly reduce fuel consumption and CO₂ emissions. “Eco-Driving” is easy to apply:

- Shift into a higher gear early; maintain a steady speed in the highest possible gear; anticipate traffic flow; switch off the engine at short stops
- Check and adjust the tyre pressure regularly
- Make use of in-car fuel saving devices such as on-board computers and dynamic navigators
- Remove surplus weight and unused roof racks

HIGHLY COST-EFFECTIVE: Eco-driving training leads to a fuel economy of up to 25 %, with a significant long-term effect of 7% under everyday driving conditions. Eco-driving could be part of the learning package for new drivers. Training could also cover professional, experienced drivers. The European Climate Change Programme calculated that the CO₂reduction potential of eco-driving would be in the order of 50 million tonnes of CO₂ emissions in Europe by 2010. Research clearly indicates that eco-driving is highly cost-effective. The independent research institute, TNO, estimates cost savings of up to € 128 per tonne CO₂ saved.





**4 } INFRASTRUCTURE
MEASURES
AND TRAFFIC
MANAGEMENT ARE
INDISPENSABLE**

4



TRAFFIC JAMS: Infrastructure measures have an enormous potential to reduce CO₂ emissions. Traffic jams are a major source of carbon emissions. Better road design and intelligent traffic management provide effective solutions. ACEA investigated the yearly CO₂ reduction potential and costs of substituting 50% of current traffic lights with modern dynamic lights, thus generating an optimal traffic flow. Annual savings of 2.4 million tonnes CO₂ are possible. Adjusting road surface can reduce rolling resistance by up to 40%, delivering 5% of CO₂ reductions.



JAPAN: A recent study in Japan showed the impact of traffic-flow improvement on CO₂ reduction. The new “Oji section” of the Tokyo Metropolitan Expressway, opened in December 2002, has reduced annual CO₂ emissions in central Tokyo by between 22,000 and 31,000 tonnes. This corresponds to the annual gasoline consumption of around 10,000 cars. In its recently adopted CO₂ strategy, Japan has incorporated infrastructure measures on a large scale. In total, 52% of CO₂ reductions from cars will come from measures other than vehicle technology.

A young child with curly hair, wearing a dark jacket, is looking out of the open driver-side window of a dark-colored car. The car is parked at a gas station, with a green fuel nozzle visible in the foreground. In the background, there is a white building with a sign that reads "ELECTRIC" and a poster of two people riding bicycles. The scene is brightly lit, suggesting daytime.

5 } CO₂-RELATED TAXATION
OF CARS AND OF
ALTERNATIVE FUELS
ARE KEY

5



SHAPING DEMAND: CO₂-based taxation of cars and of alternative fuels has a significant CO₂ reduction potential by shaping consumer demand and setting economic incentives to which vehicle manufacturers and fuel suppliers will respond. A CO₂-based taxation system raises customer awareness and involves drivers and car owners alike. Recent experiences in some EU member states (the UK, the Netherlands and Sweden, for example) show that taxation measures can have a significant influence on consumer behaviour and demand.

MARKET SIGNALS: Currently, eleven EU member states have introduced, in their taxation systems, elements based on the car's CO₂ emissions and/or fuel consumption and more countries will follow in 2008. Yet, the current systems differ greatly across the EU and therefore fail to send clear market signals. Manufacturers face a fragmented EU market and are unable to exploit economies of scale. The European car manufacturers advocate harmonised taxation of cars and of alternative fuels in the EU. Taxation should neither favour nor discriminate a specific technology, and every gramme CO₂ should be taxed the same.

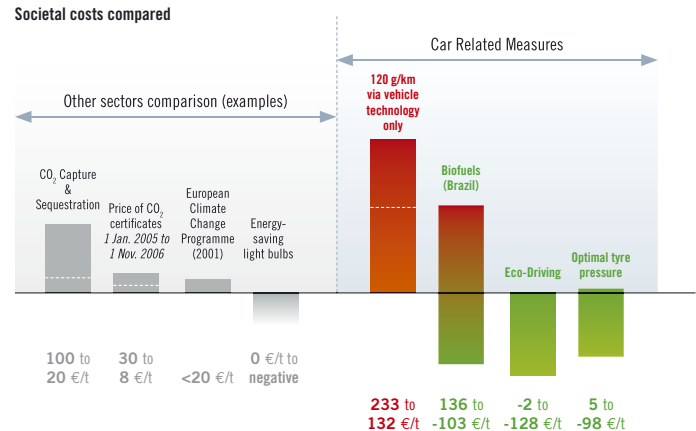


WHAT ARE THE COSTS OF CO₂ REDUCTIONS THROUGH VEHICLE TECHNOLOGY?

Within the European Climate Change Programme, the independent scientific institute, TNO, assessed in 2006 the costs and CO₂ reduction potential of different measures, including vehicle technology, biofuels and infrastructure. The costs of moving towards 120 gCO₂/km by 2012 through vehicle technology were calculated to be at about € 3600 on average per vehicle. The costs of reducing down to 130 gCO₂/km are still prohibitively high with at € 2500 per vehicle, endangering car production in Europe.

SOCIETAL COSTS: Taking into account the price of technology and the fuel savings for consumers, the TNO institute calculated societal costs of emission cuts through vehicle technology at between € 132 and € 233 per reduced tonne of CO₂, depending on the oil price. This is up to ten times more expensive than other traffic-related measures.

COST-EFFECTIVENESS IS KEY: It is essential to find the most cost-effective way to achieve the maximum result in reducing CO₂ emissions from cars. Cost-analysis by independent researchers show that larger CO₂ emission reductions can be achieved without endangering manufacturing in the EU. That is why the automobile industry proposes combining different methods, including changing driver behaviour, infrastructure measures, alternative fuels, CO₂-related taxation and vehicle technology.

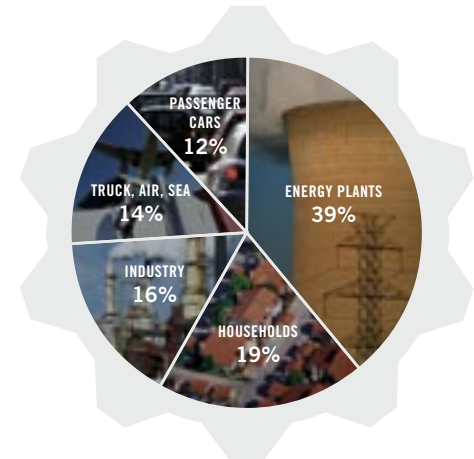


HOW MUCH CO₂ DOES THE EUROPEAN CAR FLEET EMIT?

In Europe, passenger cars contribute to 12% of man-made CO₂, according to figures from the European Commission for the EU 25. The share of transport is 26%, of energy plants 39%, of industry 16% and of households 19%.

EMISSIONS COME FROM USAGE: Emissions from new cars have decreased by over 13% in the last decade. The majority of CO₂ emissions is now caused by the aging car fleet, a lack of traffic management and increased mileage. Between 1995 and 2003, motorists in the EU 25 increased their annual mileage by 16.4%. Furthermore, the ownership of cars rises faster than the sales of newly produced cars.

AGING CAR FLEET: The average age of cars in the EU 15 is now 8 years and up to 14 in the new EU Member States, to the detriment of the environmental performance of the car fleet. A strategy to reduce CO₂ emissions from cars cannot just focus on new cars and on vehicle technology. Climate change is a complex and global problem that can only be tackled when efforts are combined.



CO₂ emissions in the EU

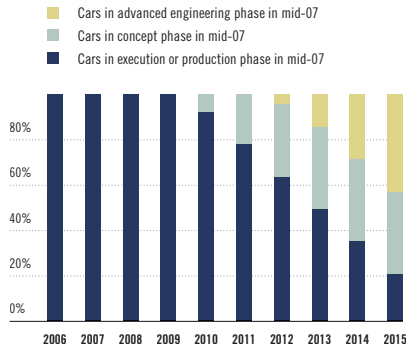
SOURCE: EU Commission 2004

LEAD-TIME IS ESSENTIAL: CAR'S CONCEPT PHASE AND PRODUCT CYCLE TAKE UP TO 12 YEARS

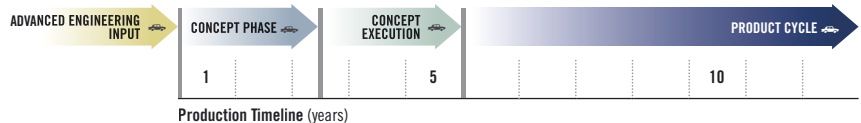
Cars are highly complex and innovative products. Their development - from design to production logistics - takes up to 5 years. Their product cycle, or the time they are kept in production, comprises up to 7 years. Vehicle and engine adjustments are hugely complicated and capital-intensive operations. Manufacturers and their suppliers plan and allocate production capacity well ahead. To be able to adjust automobiles to new legal requirements, the car industry needs sufficient "lead-time".

LEGISLATION: The implementation of a legislative framework on CO₂ emissions from new cars is not feasible before 2015. The European car manufacturers will, regardless of mandatory measures, continue to reduce CO₂, as they have done over the past decade. Still, for technical reasons, legal requirements must be known years beforehand. Every detail matters, as a further reduction of carbon emissions through vehicle technology affects the fundamentals of a car: its engine, transmission, weight and aerodynamics. CO₂ emissions cannot be reduced through filters or other forms of «after treatment».

Production is planned well ahead



LEAD-TIME – COMMON PRACTICE: Lead-time is an accepted part of legislation. In the Euro 6 standards on reducing further nitrogen oxide from car, adopted in 2006, a lead-time of around ten years was provided: the date for the entry into force of Euro 6 for all new cars is 2015. Lead-time is also common in other industrial sectors and world regions.

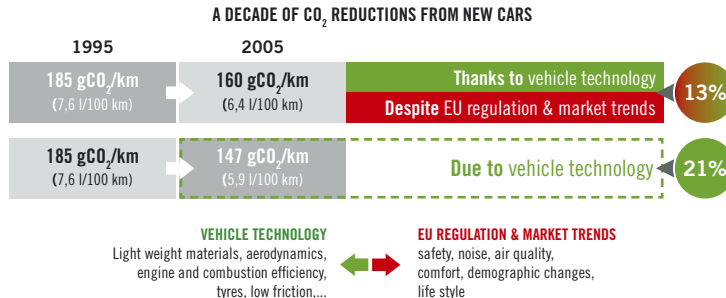


WHAT DOES THE “1998 COMMITMENT” SAY?

The 1998 Commitment was signed by the automotive industry’s trade association, ACEA, and the European Commission in 1998, to help achieve the EU Community’s Kyoto goals. Its most highlighted feature is the agreement to reduce CO₂ emissions from new passenger cars to 140 gCO₂/km by 2008 mainly through vehicle technology.

LESS KNOWN: Much less known is that the Commitment is part of a three-pillar strategy of the EU Community with the longer-term goal of reducing car CO₂ emissions to 120 gCO₂/km by 2012 by means of a more comprehensive package of measures besides vehicle technology.

OTHER PILLARS: The other two pillars were meant to shape consumer demand through taxation measures and a labelling scheme providing information to consumers. The European Commission has now repeatedly acknowledged that only the first pillar – the 1998 Commitment – has yielded results; the other two have not. Regrettably, this has negatively impacted the achievements of the car industry.



CONDITIONS: The 1998 agreement stipulates explicitly that external factors, such as regulation, market changes and the economic environment may influence the progress in CO₂ reduction and states that these factors should be taken into account when assessing the Commitment and the performance of the car industry.

Technology alone will not yield sufficient results. Improvements in vehicle technology have been offset by conflicting EU regulations on air quality and safety, and by a market trend towards larger, more comfortable cars and a persistent low demand for fuel efficiency. With an integrated approach to reducing CO₂, these developments can be addressed.

1 IMPROVEMENTS IN VEHICLE TECHNOLOGY WILL CONTINUE



3 CHANGES IN DRIVING STYLE WITH "ECO-DRIVING"

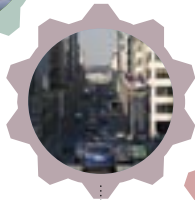


BIOFUELS PLAY AN ESSENTIAL ROLE

2

INFRASTRUCTURE MEASURES AND TRAFFIC MANAGEMENT ARE INDISPENSABLE

4



5 CO₂-RELATED TAXATION OF CARS AND OF ALTERNATIVE FUELS ARE KEY



Integrated Approach

European
Automobile
Manufacturers
Association

ACEA represents the fourteen major European car, truck and bus manufacturers. They provide direct employment to 2.3 million people and support the jobs of another 10 million employees. Members are: BMW Group, DAF Trucks, DaimlerChrysler, FIAT, Ford of Europe, General Motors Europe, MAN Nutzfahrzeuge, Porsche, PSA Peugeot Citroën, Renault, Scania, Toyota Motor Europe, Volkswagen and Volvo Group.



ACEA

www.acea.be

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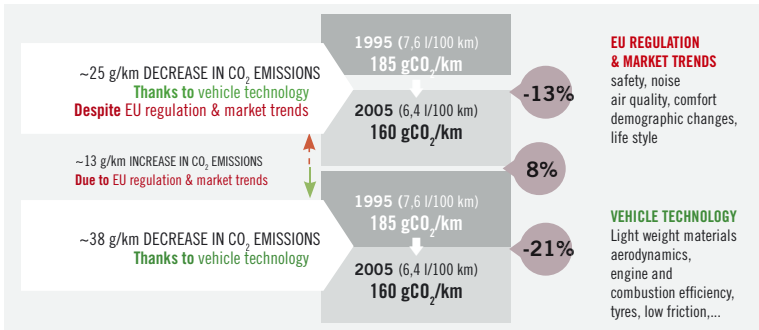
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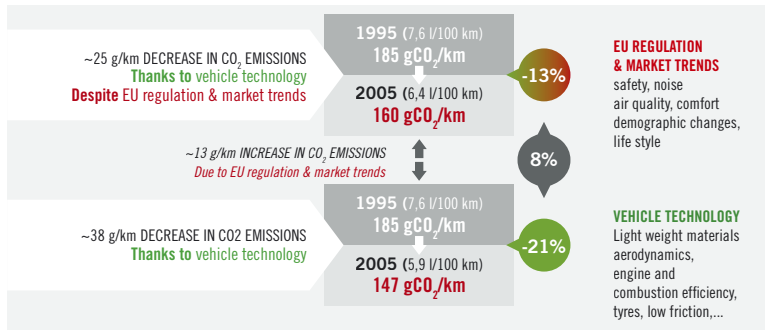
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VEHICLE TECHNOLOGY

Light weight materials
aerodynamics,
engine and
combustion efficiency,
tyres, low friction,...

EU REGULATION & MARKET TRENDS

safety, noise
air quality, comfort
demographic changes,
life style

