



**EUROPEAN COMMISSION**

DIRECTORATE-GENERAL FOR ENERGY AND TRANSPORT

DIRECTORATE G - Logistics, innovation, co-modality & maritime transport  
**Clean Transport & urban transport**

Brussels, 16 January 2007  
TREN/G.4/FS/jt

**Preparation of the Green Paper on urban transport**

Technical Workshop  
"Urban transport and green propulsion"  
Brussels, 31 January 2007

Discussion Paper on the Promotion of Clean and Energy Efficient Vehicles

NOTICE

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# **European Transport Policy in Support of Green Propulsion in Road Transport**

## **INTRODUCTION**

Mobility has become an inherent element of our world, essential for the ever closer integration of Europe and instrumental for Europe's communication and exchanges with other parts of an ever globalised world.

Increasing mobility, however, has to be coherent with sustainable development and respect environment. The integration of environment and sustainable development into sectoral policies, in fact, has been the objective of European policy for several years, setting a clear signal at the European Council in Cardiff 1998. Transport has been the first sector developing an overall strategy along this line in 1999. The approach then was broadened with the Sustainable Development Strategy enshrined by the European Council in Goteborg 2001.

Many concrete actions have been taken since then. Environmental considerations, in fact, have become an integral part of European transport policy, implementing the Lisbon strategy renewed in March 2005. Mastering mobility and intelligent transport management should provide a basis for the prosperity of all citizens, present and future.

European transport policy takes a holistic and multimodal approach and aims at "Green Propulsion" in all modes, throughout the whole transport sector. This paper gives an overview on the actions taken or planned by the European Commission in the area of road transport.

## **1. MAIN ENVIRONMENTAL CHALLENGES RELATED TO TRANSPORT**

**The main environmental challenges to transport policy are related to the energy resources used to move goods and persons, and to the impact of transport on global climate and on local air quality. Three main issues therefore have to be tackled:**

- The excessive dependence of transport on oil with its impact on security of supply;
- CO<sub>2</sub> emissions from transport with their impact on climate change;
- Pollutant emissions from vehicles with their impact on health.

Urban transport deserves particular consideration. Pollutant emissions from motor vehicles impact on air quality, which in many cities does not yet meet EU standards. Around 40% of transport related CO<sub>2</sub> emissions and up to 70% of pollutant emissions from transport come from road traffic in urban areas.

## **2. ACTIONS TAKEN TO RESPOND TO THESE CHALLENGES**

### **2.1. Reduction of oil dependence of transport**

The transport sector has seen increasing energy demand. Today, the energy issue, which has risen to the top political agenda, is predominantly an issue for the transport sector. Transport nearly entirely depends on oil as energy source, where concerns on availability and security of supply are largest.

The European Commission has taken action to maintain and improve mobility for the future by reducing the use of oil in transport, and in particular in the road transport sector. The

measures are guided by a two-pronged approach: first improving energy efficiency, and second promoting alternative fuels to gradually substitute oil.

**Energy efficiency** of vehicles is supported by voluntary agreements of the European Commission with the automotive industry with the aim to reduce energy consumption and at the same time CO<sub>2</sub> emissions of new cars<sup>1</sup>. The objective is a reduction in average fuel consumption of all new cars by 25% between 1995 and 2008/9. Meanwhile, significant improvements have been achieved in vehicle technology, leading to higher fuel efficiency. As a result, the average fuel consumption of new cars has fallen by 15%, from 7,6 litres/100 km in 1995 to 6,4 litres/100 km in 2004.

**Alternative fuels** have been given high weight in a Communication of the European Commission of 2001<sup>2</sup>, which identified biofuels, natural gas, and hydrogen as the main candidates and proposed an indicative target of 20% market share overall by 2020.

Biofuels as the most mature and most promising alternative fuels with a perspective for fast market broadening have been supported by legislative actions adopted in 2003. A Directive on the promotion of the use of biofuels or other renewable fuels for transport<sup>3</sup> set reference targets for the market share of biofuels of 2% in 2005, increasing by three quarter of a per cent annually to 5.75% in 2010. A Directive on the taxation of energy products<sup>4</sup> allows Member States to reduce taxes on biofuels or completely exempt them from taxes.

Following up, the Alternative Fuels Contact Group called by the Commission from experts from the main stakeholders in Europe, assessed the technical and economical basis for future developments of alternative fuels and confirmed in its report on the "Market Development of Alternative Fuels" of December 2003 a considerable market potential for alternative fuels, consistent with the 20% substitution target for 2020.

These actions have resulted in important progress. The market share of biofuels has strongly increased, but it remains nevertheless still below the level required by the directive.

The sale of the natural gas vehicles and the number of natural gas filling stations have increased appreciably in some Member States where the use of natural gas or of biogas as motor fuel is supported by economic incentives or legislative obligations.

**Research and technological development** programmes in transport and energy, funded by the Framework Programmes of the European Union, have had a strong focus on clean and energy efficient technologies.

Major demonstration projects have been supported by Community funds to accelerate the development of alternative fuels and the technologies necessary for their use in vehicles. Biofuel production and their use in captive fleets have been supported in several projects in the framework of "Biofuels Cities". The BEST project supports biofuels with a strategic introduction of more than 10 000 vehicles and more than 140 fuelling stations in 10 towns and regions. The BIOGASMAX project supports production, distribution, and use of biogas as

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<sup>1</sup> Voluntary agreements with automotive industry: COM(98)495, COM(99)446 and Recommendations of the Commission on the reduction of CO<sub>2</sub> emissions from cars 1999/125/EC of 5 February 1999 (ACEA) 2000/303/EC, 13 April 2000 (KAMA) and 2000/304/EC of 13 April 2000 (JAMA);

<sup>2</sup> COM(2001)547

<sup>3</sup> Directive 2003/30/CE

<sup>4</sup> Directive 2003/96/CE

transport fuel. Hydrogen and fuel cells have been supported with 300 M€ from the Sixth Framework Programme (2002-2006) of the European Union. Particularly successful was the CUTE project, which has put into operation buses running on hydrogen, has established a solid basis for the development of the market of this clean and innovative technology. In October 2006 half a dozen of cities signed a "Memorandum of understanding" for the purchase of several hundred hydrogen buses.

A European Technology Platform on hydrogen and fuel cells has been initiated by the European Commission in 2004 to accelerate the development of hydrogen as a fuel. This Technology Platform has drawn up, in 2005, strategies for research and deployment of hydrogen and fuel cell technologies over the next 15-25 years were drawn up and presented an implementation plan to align research and development work over the next 10 years.

The search for integrated solutions for clean urban transport has also been supported within the framework of the CIVITAS initiative. The European Commission has invested around 100 M€ in 36 cities throughout Europe. It will continue supporting this type of initiative in the future.

## **2.2. Reduction of CO<sub>2</sub> emissions**

Transport is, together with energy, one of the two main sectors in the CO<sub>2</sub> emissions chart in Europe, with a share of 26% at present. Road transport alone presently contributes 84% of all transport emissions in the European Union. The rest comes from aviation (14%) and rail and inland waterways (2%).

While the EU as a whole has reduced its emissions of greenhouse gases by just under 5% over the 1990-2004 period, the CO<sub>2</sub> emissions from road transport have increased by 26%, with about 12% of the overall EU emissions of CO<sub>2</sub> coming from the fuel consumed by passenger cars. Actions in this area therefore are most important to build up a long-term perspective of substantial reductions of CO<sub>2</sub> emissions overall.

The European Commission has proposed a Community strategy on the reduction of the CO<sub>2</sub> emissions by cars in a Communication in 1995<sup>5</sup>.

This strategy is based on three pillars:

- a voluntary agreement between Commission and the automotive industry, as formalised in 1998/9 to reduce the average CO<sub>2</sub> emissions of new cars to 140 gCO<sub>2</sub>/km by 2008/9;
- a taxation system for cars based on the emissions of CO<sub>2</sub>, as proposed by the European Commission in a Communication of 2002<sup>6</sup>, and then in a proposal for a Directive in 2005<sup>7</sup>;
- better information for the consumer on the performance of cars in terms of CO<sub>2</sub> emissions, as stipulated by the labelling directive of 1999 which requires the display of the CO<sub>2</sub> emissions of cars in the sales rooms.

Car manufacturers have made continuous and substantial progress towards improving the fuel efficiency of their cars, thereby lowering the CO<sub>2</sub> emissions. In 2004 average CO<sub>2</sub> emissions of new passenger cars sold in the EU15 were 163 g CO<sub>2</sub>/km, 12.4% below the 1995 level of

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<sup>5</sup> COM(95)689

<sup>6</sup> COM(2002) 431

<sup>7</sup> COM(2005) 261

186 g CO<sub>2</sub>/km. Thanks to the efforts undertaken under the voluntary commitments, the car industry has delivered a sizeable contribution to the EU strategy for reducing greenhouse gas emissions and to its Kyoto reduction objectives. However, car manufacturers will have to make major additional efforts to reach the 140g CO<sub>2</sub>/km target by 2008/9. The European Commission has already stated that, if it becomes clear that industry will not honour its commitments, it will consider proposing measures, including legislative ones, to ensure that the necessary CO<sub>2</sub> reductions are achieved.

Furthermore, the European Commission is currently carrying out a review of the Community strategy to reduce CO<sub>2</sub> emissions from cars in order to reach the equivalent of 120 g CO<sub>2</sub>/km objective by 2012, within an integrated approach.

Support to energy efficient and CO<sub>2</sub> saving vehicle technology is also provided by the proposal for a new Euro 5 emission standard. The proposal includes the type-approval of hybrid vehicles and incorporates the measurement of CO<sub>2</sub> and fuel consumption and the evaluation of smoke from diesel vehicles under free acceleration conditions.

The improvements in vehicle technology, with the resulting gains in fuel efficiency, however, have not been enough to neutralise the effect of increased traffic and car size. In the light of this and of the EU's obligations under the Kyoto protocol, the European Commission is determined to address CO<sub>2</sub> emissions and fuel consumption from road transport. Reaching the EU objective of 120 g CO<sub>2</sub>/km by adopting an integrated approach in line with the recommendations of the CARS 21 High Level Group, is one of the core measures of the recent energy efficiency action plan and of the renewed EU sustainable development strategy.

### **2.3. Reduction of pollutant emissions**

Air pollution as a cause of health problems has been tackled in the legislation of the European Union on emission limits of pollutants from vehicles, and also fuel quality standards. The Euro pollutant emission standards<sup>8</sup> have gradually reduced pollutant emissions. The limit value for particulate emissions, e.g., was reduced by a factor of 18 for heavy duty vehicles between Euro I in 1993 and Euro IV in 2006. For cars, emission limits will be reduced by a factor of 28 between Euro 1 in 1993 and the Euro 5 standard proposed by the European Commission in 2005 for application from 2010.

The Euro 5 proposal<sup>9</sup> which sets new emissions limits for the exhaust emissions from light duty vehicles, is currently in the co-decision process. It will replace the previous emissions legislation<sup>10</sup>. Council and European Parliament are currently in discussion on this draft Regulation, amended with an additional later Euro 6 stage.

The next standard of the Euro V stage for exhaust emissions from heavy duty vehicles will be applicable from 1 October 2008, and a proposal for a next step with Euro VI emission limits is currently under preparation by the Commission.

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<sup>8</sup> Directive 70/220/CEE and daughter Directives: 88/77/CEE; 91/441/CEE; 91/542/CE; 94/12/CE; 98/69/CE; 99/96/CE; 2005/55/CE

<sup>9</sup> COM(2005) 683 final

<sup>10</sup> Directive 70/220/EEC

In support to the low pollutant emission requirements, fuel quality has been improved through European regulation. Sulphur content in fuels, in particular, has been strongly reduced<sup>11</sup> to a level of 10 ppm, to be applied to gas oil for road and non-road land-based transport by 2009.

As a result of consistent and vigorous legislation with gradually lower pollutant emission limits, an overall reduction of nitrous oxide and particulate emissions of 30 to 40% has been achieved since the adoption of the first Euro standard. But high levels of local pollution, particularly in the urban areas, will still require additional measures.

### **3. AN OVERALL STRATEGY FOR SUSTAINABLE TRANSPORT**

Beyond these specific actions, the overall strategy of Community transport policy aims at meeting the major challenges of oil dependence and of climate change.

Several recent strategy documents for the transport and energy sectors deal with aspects of sustainable development. A number of concrete political actions have already been proposed.

#### **3.1. White Paper on transport**

The **mid-term review of the White Paper on transport**: "Keep Europe moving – Sustainable mobility for our continent"<sup>12</sup> aims at de-connecting the development of sustainable mobility from negative effects, in particular the impact on environment. It envisages in particular the deployment of intelligent transport systems, and modal transfer to rail and waterways transport.

- **Innovation** in all fields of transport is an absolute priority of the White Paper. The satellite navigation system GALILEO will give a range of options to improve the management of traffic and logistics.
- Particular attention, also in the applications of GALILEO, is given to the development of **intelligent transport systems**, such as Intelligent Cars for road transport.
- An **intelligent charging system** should contribute to use more efficiently existing infrastructure, reduce congestion and limit pollution. A general framework for charging is foreseen to be presented in 2008 for an assessment of external costs, such as congestions, accidents, and pollution, for all modes of transport.

All these actions should improve transport efficiency and thereby reduce the consumption of energy and emissions of pollutants and CO<sub>2</sub> from transport.

#### **3.2. Urban transport**

Urban transport is of particular importance, as 80% of European citizens live in urban areas. Therefore the European Commission envisages presenting a **Green Paper on Urban Transport** in 2007, which will examine all possible common solutions based on approaches which have been tested successfully by the most ambitious European cities (urban road pricing zones, "green" zones, use of alternative fuels, improvement of the logistics for freight deliveries, public transport, safe infrastructures for walking and cycling).

The main objective of the Green Paper will be to examine whether there are obstacles to an urban transport policy at the level of the European Union and if there is a consensus to develop and implement common solutions of "European interest", while fully respecting the

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<sup>11</sup> Directive 99/32/EC

<sup>12</sup> COM (2006) 314

principle of subsidiarity. All modes of transport, both for passenger and freight transport will be covered by the Green Paper on Urban Transport with the aim to develop an integrated approach. An open debate should make it possible to identify how actions at European level can best contribute in a constructive way to local actions in these sectors.

The preparations for the Green Paper on Urban Transport should also include consultations on the Commission **initiative on clean vehicles**. The European Commission's objective is to create a market, in order to encourage the manufacturers to build clean vehicles at a lower price. Reflections on possible ways forward could include, among others, environmental procurement criteria and early application of new Euro standards. The criteria for vehicle procurement by public bodies could include e.g., in addition to the other criteria, life-time costs for energy consumption and for CO<sub>2</sub> and pollutant emissions. Such an approach could give a competitive advantage to the cleanest and most efficient vehicles and also minimise the overall societal cost.

### 3.3. Energy efficiency

The **Green Paper on energy efficiency**<sup>13</sup> addresses transport as a key sector, and a number of concrete measures are proposed in the **Energy Efficiency Action Plan**<sup>14</sup> presented by the European Commission on 19 October this year. An integrated approach, covering different actors, including motor and tyre manufacturers, drivers, oil/fuel suppliers and infrastructure planners is necessary, as stated by the Energy Efficiency Action Plan. The call for such an integrated approach, involving industry, policy, and consumers has been pioneered by CARS 21, a common initiative of all stakeholders initiated by the Commission with the objective to make cars cleaner and safer through packages of technical and non-technical measures.

The measures proposed in the Energy Efficiency Action Plan address all actors:

- An amendment to the directive on the labelling of cars according to fuel efficiency is envisaged to widen the scope and to harmonize the display throughout the European Union, with the objective of encouraging the consumers to acquire more energy-efficient vehicles;
- A mandate for a European standard, and if possible an international standard, to set maximum limits of the rolling resistance tyres, and the labelling of tyre performance will be prepared;
- Tyre pressure control systems will be proposed;
- Energy-efficient eco-driving should be supported by a legislative proposal on harmonised requirements for the education of drivers, and by specific projects. Energy-efficient eco-driving will be addressed by a European campaign launched by the Intelligent Energy Europe Agency.

### 3.4. Energy supply

Following the **Green Paper on a European strategy for secure, competitive and sustainable energy**<sup>15</sup> of March 2006, the European Commission has presented a proposal for a new European energy policy in its report "**An Energy Policy for Europe**"<sup>16</sup> with the core energy objective for Europe to reduce greenhouse gas emissions from its energy consumption by 20% by 2020. Improvement of energy efficiency in transport and diversification of energy

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<sup>13</sup> COM(2005)265

<sup>14</sup> COM(2006) 545 final

<sup>15</sup> COM (2006) 105

<sup>16</sup> COM (2007) 1

resources through the development of alternative fuels for the transport sector, and a long term vision for energy technology development are among the main lines.

The European Commission will possibly propose additional measures aiming to strengthen the development of the biofuel market in order to achieve the objectives quantified for 2010. In fact, the European Commission considers that the potential exists for a considerably larger market share than the 5,75% envisaged for 2010. In December 2005, the Commission has adopted a **Biomass Action Plan**<sup>17</sup>, comprising more than 30 actions to promote biofuels in the European Union. In February 2006, the European Commission presented a Strategy for Biofuels<sup>18</sup>, with a range of market-based, legislative and research measures to boost production of fuels from agricultural raw materials.

### **3.5. Research and technological development**

The research and technological development programmes for transport of the **Seventh Framework Programme** of the European Union, foresee support for green propulsion technologies. Integrated solutions in urban transport will be supported by increased support from a continuing CIVITAS programme. Common initiatives on technology development, such as the Technology Platform on biofuels or the "Joint Technology Initiative" planned for hydrogen could accelerate the market development of innovative technologies within the framework of public-private partnerships, with the participation of industry, Member States and Regions. Financing should be ensured by various sources, including Community funds.

## **4. CONCLUSIONS**

All these actions in the area of road transport, envisaged and embedded in the framework of a holistic approach to European transport policy, should allow to substantially progress towards green propulsion, which on one side ensures mobility for the citizens in Europe in the future, and on the other side provides a secure and sustainable basis for the energy supply to transport and reduces the impact of transport on global and local environment.

The European Commission has the firm intention to go ahead towards implementation of the measures necessary to ascertain sustainable mobility with green propulsion in the future.

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<sup>17</sup> COM (2005) 628

<sup>18</sup> COM (2006) 34