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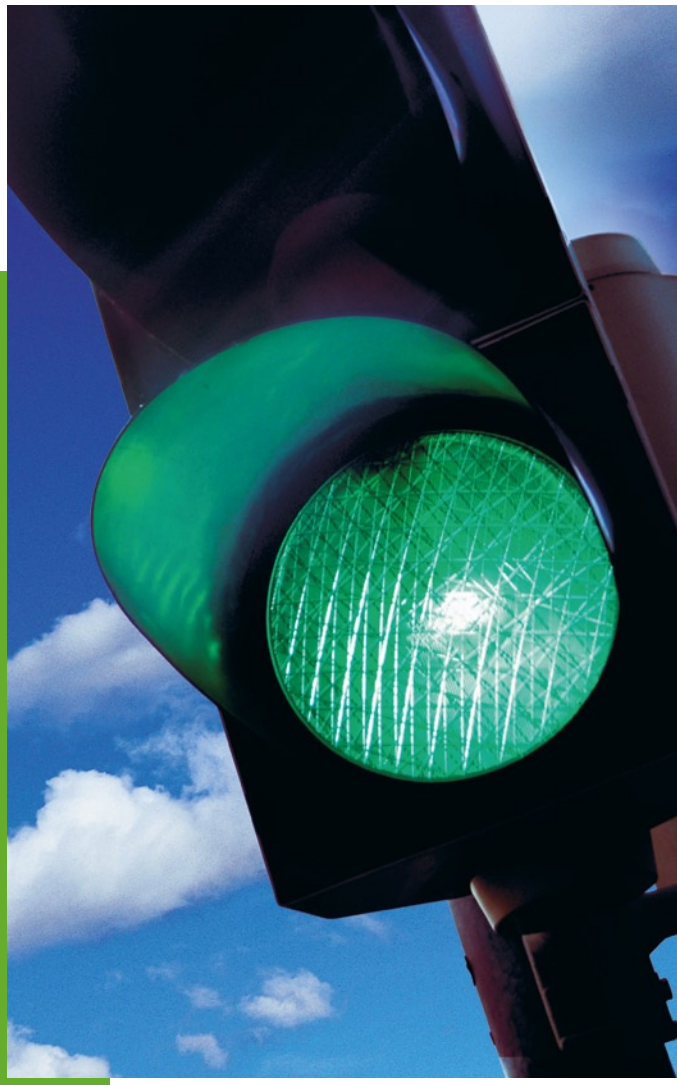
SOFT MOBILITY

Measures for a climate-friendly transport policy in Europe



2nd edition

Michael Cramer
Member of the European Parliament

Stop climate change. Play your part.

The Greens | European Free Alliance
in the European Parliament

Commissioned by Michael Cramer MEP,

in the framework of the Climate Change Campaign

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Preface

Change transport, not the climate

Dear Readers,

all over the world people are talking about and fearful of the financial meltdown and the economic crisis – just a few months after the world realised it is facing a threat to its very existence in the form of climate change. Now, in mid-2009, we are forced to acknowledge that the threat to the climate continues unabated and the world economic slide is proceeding apace.

We shall only master these two Herculean tasks of our time if we tackle them together – by means of a Green New Deal! Billions in investment to boost the economy must be used to change our economy and our society into a sustainable society. Nowhere is that clearer than in the transport sector: billions in aid for the automotive industry will only help overcome the crises if they also bring sustainable change leading to soft mobility, that is to say mobility which is people-friendly and environmentally friendly.

Tackling climate change means not overlooking transport. In the EU, transport is responsible for 30% of all emissions that are damaging to the climate, and that figure is increasing rapidly. Since 1990, CO_2 emissions from transport have risen by a third, while billions in investment have reduced such emissions by 10% in other sectors. In other words: growth in the transport sector more than outweighs the climate successes of other sectors.

Irrespective of these figures, transport was overlooked by Kyoto – as it was in the EU climate change package, which is weakest in precisely this sector. Transport must therefore be finally included in a follow-up agreement to the Kyoto Protocol. Otherwise the fight against climate change will fail.

With this revised and updated version of this brochure we Greens want to demonstrate how we can be mobile without damaging the climate. Our three-pronged approach is reduction, modal shift and efficiency.

I therefore hope you will enjoy reading this and learn plenty from it!

Michael Cramer

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1 Present situation: transport versus protection of the climate

THESIS 1: **Emissions of greenhouse gases from transport in Europe are increasing in both absolute and relative terms. Without additional and strategically coordinated measures in the realm of transport, the EU will fall far short of the climate-protection targets it has set itself.**

Under the Kyoto Protocol, the European Union has pledged itself to cut the greenhouse-gas emissions of the 15 older Member States by 8% in relation to the 1990 level during the period from 2008 to 2012.

In 2006, the 1990 emission level had only been reduced by 2.7%.[1] The enlarged 27-member EU, which does not have a common Kyoto target, has nevertheless managed a 7.7% reduction, due primarily to the rapid transformation in the domains of industrial manufacturing and energy production following the demise of socialism in the countries of Central and Eastern Europe. The common EU target of reducing CO_2 emissions by 2020 by at least 20% compared to the 1990 level, or even by 30% if other industrialised and newly industrialised countries are included, is not achievable if there is a linear continuation of the trend.

Land transport was a major source of greenhouse gases in Europe in 2006, producing 20% of the total volume of emissions. It was also the only sector in which emissions had been rising sharply since 1990, the total increase in CO_2 emissions in this sector having amounted to some 25%. In the 15 older EU Member States, emissions rose by an annual average of 1.7% between 1990 and 2005. In the ten new Member States, the average increase was initially only 0.2%. Since 2000, the picture has changed: greenhouse-gas emissions in the new Member States are now increasing at an average annual rate of 5.6%, whereas emission growth in the older Member States has slowed down to one per cent a year. Three quarters of the volume of CO_2 emissions from land transport operations are produced by road traffic.[2]

The greenhouse-gas emissions from air transport and international sea transport must also be taken into account. They are responsible for about 3% (air transport) and 4% (sea transport), respectively, of the CO_2 emissions in the EU-27, but there is a sharp upward trend.[3] Whereas emissions from shipping rose by an annual average of 2.3% from 1990 to 2000, a figure that has even increased to 2.9% for the period since 2000,[4] the growth in the volume of air traffic over the same period has actually amounted to 5.6%.[5]

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1 EEA 2008b: Annual European Community greenhouse gas inventory 1990–2006 and inventory report 2008 Submission to the UNFCCC Secretariat: http://reports.eea.europa.eu/technical_report_2008_6/en/Summary_Annual_EC_GHG_inventory_19902006_and_inventory_report_2008

2 See Eurostat (2005): Annual European Community greenhouse gas inventory 1990–2003 and inventory report 2005: http://reports.eea.europa.eu/technical_report_2005_4/en/EC_GHG_Inventory_report_2005.pdf

3 Because air transport emits greenhouse gases into higher atmospheric strata, its impact on the greenhouse effect is far greater than that of land transport. One reason for this is the formation of ozone resulting from emissions of nitrogen oxide, while vapour trails from aircraft produce cirrus clouds, which are also suspected of magnifying the greenhouse effect. This is why the Intergovernmental Panel on Climate Change (IPCC) came to the conclusion in 1999 that the climatic effect of air transport is two to four times greater than the impact of CO_2 emissions alone (see COM(2005) 459 final: Communication of 27 September 2005 on reducing the climate-change impact of aviation, p. 4).

4 CO_2 emissions from global shipping were assessed at 813 million tonnes for 2001 (cf. V. Eyring et al., 'Emissions from International Shipping: 1. The last 50 years', in Journal of Geophysical Research, No 110/2005. http://www.agu.org/pubs/crossref/2005/2004JD005619.shtml). That is equivalent to the total of CO_2 emissions from road traffic in the 25 Member States of the EU.

5 Op. cit., pp. 101-102.

Fig. 1: The increase in emissions from transport is negating progress in other sectors. If the CO_2 emissions from transport had fallen in the same way as in other sectors in the period 1990-2006, the CO_2 emissions from the EU of 27 would now be 9.3% lower than in 1990 instead of only 0.2%.[6]

See also the table "CO_2 emissions in the EU-27", page 40.

Source: European Environment Agency, June 2008

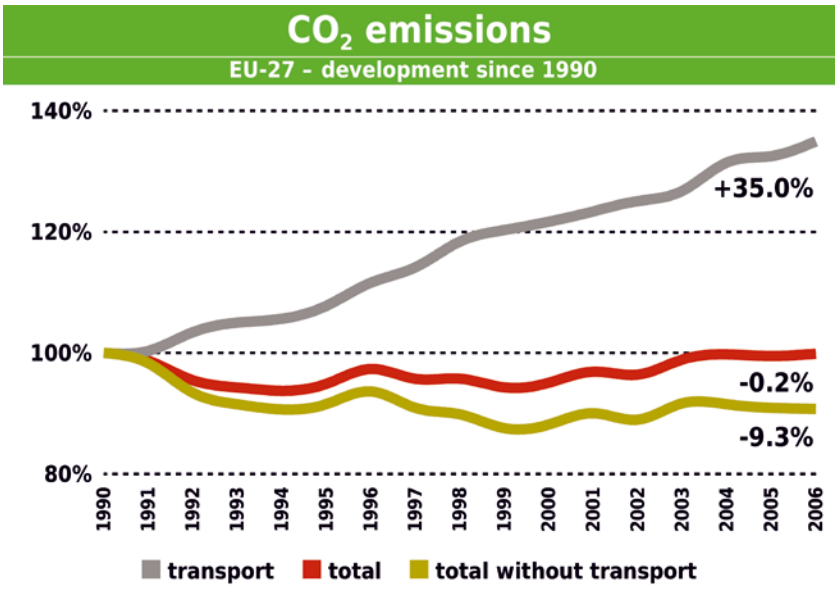
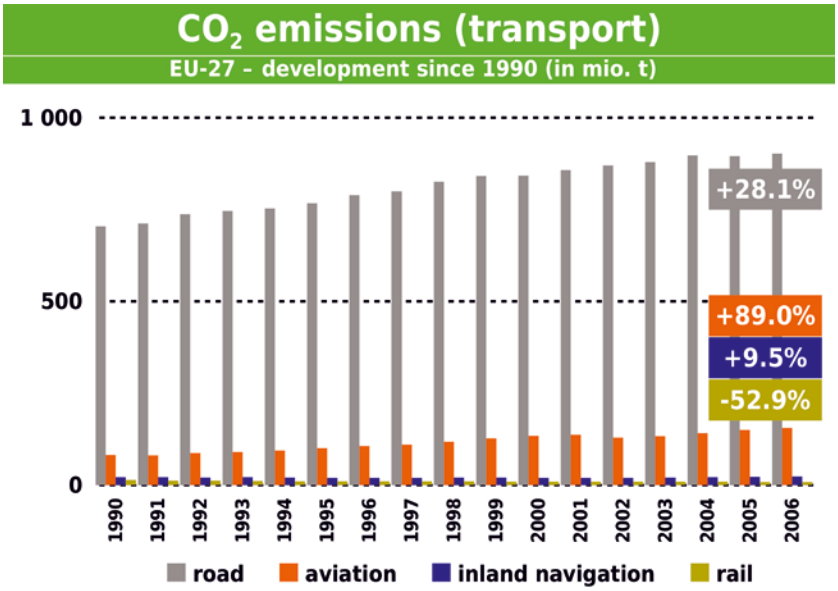


Fig. 2: CO_2 emissions from aviation and road transport have risen dramatically (grey and orange bars), while the low share of rail in CO_2 emissions has further decreased by more than one third.

See also the table "CO_2 emissions in the EU-27", page 40

Source: European Environment Agency, June 2008



CO_2 emissions from air transport have more than doubled since 1990, and those from sea transport have risen by 60%.

This makes air and sea travel, which are not covered by the Kyoto Protocol, the fastest-growing sources of greenhouse-gas emissions.

6 EEA 2008a: Climate for a transport change TERM 2007: indicators tracking transport and environment in the European Union: http://reports.eea.europa.eu/eea_report_2008_1/en/EEA_report_1_2008_TERM.PDF

If the current growth rate for air traffic is maintained, emissions from international flights from airports in the EU will have increased by 150% in the period from 1990 to 2012. This increase in emissions from international air transport would cost the Community more than a quarter of the reduction quota that forms part of its Kyoto target. Emissions from aviation, which currently account for 3% of the total volume of emissions, will develop in the longer term into a major contributor to the greenhouse effect.[7]

Taking all forms of transport together, according to the Statistical Pocketbook 2009 published by the Directorate-General for Energy and Transport of the European Commission (see the tables showing CO_2 emissions in the EU-27; Table 4.2.4, page 208[8]) CO_2 emissions in the transport sector have risen by 35% since 1990 (Figure 1, page 6).

All forecasts for the coming years in Europe are based on the expectation of growth in the volume of traffic, which will inevitably lead to increasing CO_2 emissions too, because no coordinated European strategy is being developed to curb these emissions.

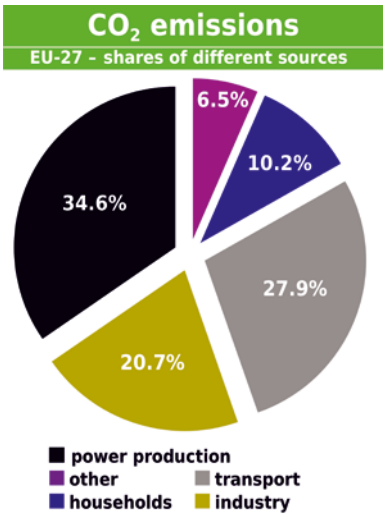


Fig. 3: In 2006, the transport sector accounted for 27,9% of all CO_2 emissions in the EU-27. This share is further increasing.

See also the table "CO_2 emissions in the EU-27", page 40

Source: European Environment Agency (EEA), June 2008

Mobility is a prerequisite and a consequence of European and global integration. Anyone who favours European integration is also bound to support freedom to travel and the free exchange of goods – within environmentally acceptable limits, of course. It is only a few years since the peoples of Central and Eastern Europe fought to secure these rights. The challenge is to ensure, in spite of these forces generating growth in the volume of traffic, that measures are taken to reduce CO_2 emissions from transport operations to a tolerable level in the medium term. This cannot and will not be achieved unless we have an EU-wide strategy which guides and coordinates the transport policies of the old and new Member States on the basis of the binding climate-protection targets.

THESIS 2: **A change of course in European transport policy and mobility management is required if Europe is to compete successfully in the world's sunrise markets.**

Forms of mobility that do not impair the global climate are also the best protection against the greatest economic threat to our societies, namely the end of availability of mineral-oil resources. Should the oil shortage arrive suddenly, for example if deliveries from Saudi Arabia, the world's foremost oil-extracting country, which accounts for 13% of global production, were to be stopped, within a short time scarcely a wheel would still be turning in Europe. The consequence would be a worldwide economic crisis – which, incidentally, would hit the world's poorest countries especially hard and would put the current banking and economic crisis in the shade.

Even without such an oil shock, the sands of time are running out on the age of fossil fuels. Almost all experts believe that it will only be a matter of years before oil extraction peaks then goes into decline. At the same time, the world's appetite for energy is growing ever more voracious. Developing and newly

7 See COM(2005) 459 final, p. 2.

8 European Commission: EU energy and transport in figures. Statistical Pocketbook 2009, Brussels: http://ec.europa.eu/transport/publications/statistics/doc/2009_energy_transport_figures.pdf

industrialised countries are now responsible for 53% of CO_2 emissions, whereas in 1992 the figure was just 38%.[9] China's CO_2 emissions have overtaken those of the United States in absolute terms. *Per capita* CO_2 emissions in the United States are 20 tonnes per annum, while in Germany the figure is 10, in China approximately 3, and in Kenya just 1 tonne. But a rapidly increasing fraction of the world's population whom poverty has hitherto condemned to low energy consumption are experiencing the sort of economic growth, especially in China and India, that is enabling more and more of them to emulate the energy-hungry lifestyle of the West. This is why China is already producing more cars than Germany, and almost all of them have been manufactured for the home market.

This development is changing the conditions in which the European car industry operates in two respects. Firstly, China will grow in the medium term into a powerful competitor in the production of low-priced cars. There is no reason why the automotive success stories of Japan and Korea cannot be replicated in China. Secondly, the pressure for low-energy propulsion technology will be dramatically increased by the growing shortage of oil. This presents the European car industry with opportunities, but also exposes it to risks. Its advantage in terms of brand image, which enables it to charge higher prices, can only be maintained if the most innovative vehicles – and that means first and foremost the most energy-efficient – come from Europe. If the European car industry hesitates, others will overtake it. Those others might even be China and India.

'Transport policy is energy policy.' That statement, made by the Greens/European Free Alliance Group in the European Parliament in its Vienna Declaration on a sustainable energy policy in Europe, needs to be re-emphasised. Unless the volume of CO_2 emissions from transport is significantly reduced, the EU will not achieve its climate-protection targets.

However, a strategy of ending dependence on oil, a 'farewell to oil' in favour of forms of mobility that protect the climate and the environment, is not only a necessity for the sake of the global climate; it is also crucial to the competitiveness of Europe. And no sector of the economy is more dependent on oil than transport. In the aftermath of the oil crisis of 1973/74 there was a great scramble to switch to other energy sources for power generation and heating, but transport has remained dependent on oil for more than 97% of its energy requirements. Strenuous efforts are needed to reduce this dependence both significantly and quickly.

Without a medium- and long-term conversion of the energy basis of transport from fossil fuels to renewable energy sources, people's mobility would sooner or later regress to pre-industrialisation standards. For this reason, we must use solar power, in the broadest sense of the term, in future to fuel our motorised transport, as otherwise vehicles will no longer run. The fact that this is not impossible is shown by the Swedish Government's plan to make the national economy, including the transport sector, entirely independent of oil imports by the year 2020.

THESIS 3: **The volume of road, sea and air traffic is increasing in Europe. The volume of traffic carried by rail, which is greener and more environmentally and climate-friendly, is stagnating or declining.**

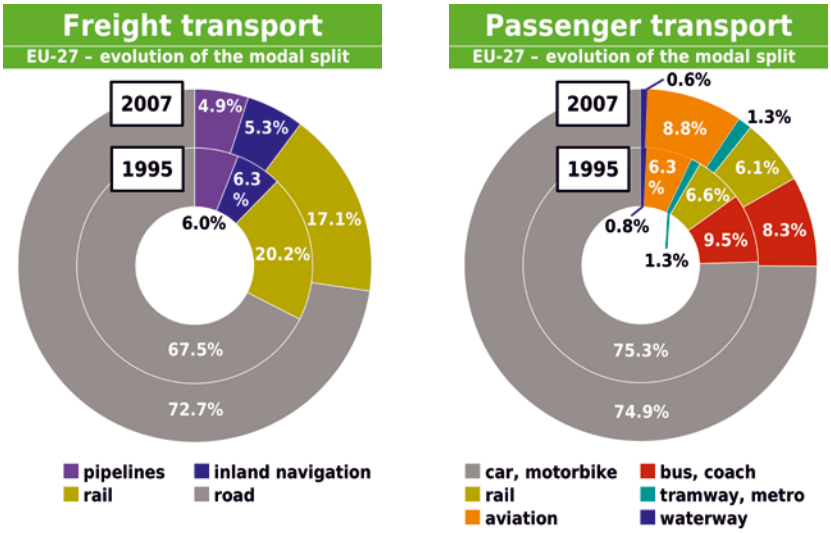
Europe is ill-prepared for the end of the oil era. The share of the transport market accruing to rail transport, which is relatively environment-friendly and energy-efficient, is dwindling everywhere, most drasti-

9 See http://www.globalcarbonproject.org/carbontrends/index.htm

cally in the new Member States, where it was by far the leading form of transport before the fall of the Iron Curtain.[10]

Fig 4/5: The evolution of the modal split for freight transport shows that the relative share of road transport has increased by 5.2% between 1995 and 2007, reaching 72.7%. The share of environmentally-friendly rail transport has decreased by 3.1%, falling to 17.1%.

Source: Statistical Pocketbook 2009, DG Energy and Transport



Traffic, especially freight traffic, continues to shift almost unabated from rail to road (Figure 4). The railways' share of the freight market in the 25 Member States of the EU, for instance, dwindled from 20.3% in 1996 to 16.7% in 2006.[11] During the same period, the share accruing to road hauliers rose from 67.4% to 72.7%.[12]

Fig. 6: Freight transport by truck accounts for more than five times more CO_2 emissions than rail and about three times more than waterborne transport.

Source: Institute for Energy and Environmental Research, database environment and transport, 2008

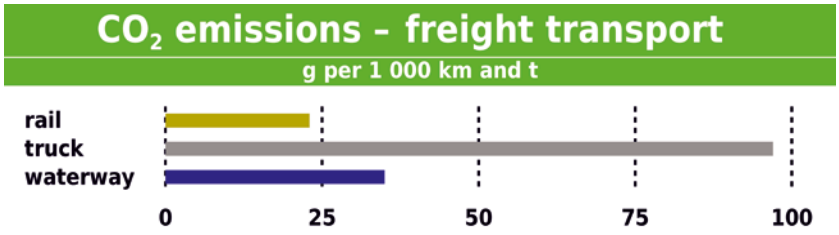
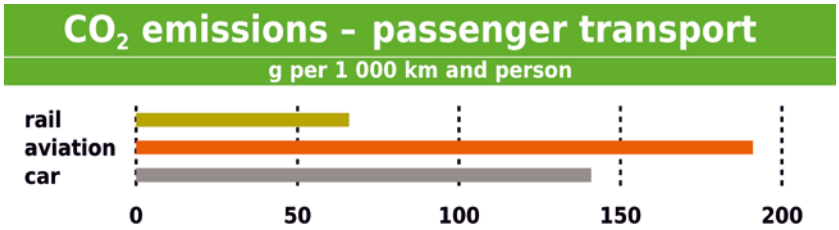


Fig. 7: Travelling by train is more than twice as climate-friendly as going by car and more than three times more climate-friendly than taking the air-plane.

Source: Institute for Energy and Environmental Research, database environment and transport, 2008



10 In the ten new Member States, some 59% of freight was still carried by rail in 1990; this figure had fallen to 43% by 2000 and 39% by 2003. During the same period, the railways' share of the freight market in the 15 older Member States declined from 20% in 1990 to 13% in 2000. By 2003, it had settled around the 14% mark; see McKinsey & Co., The Future of Rail Freight in Europe. A perspective on the sustainability of rail freight in Europe. Presentation to the European Parliament, Brussels, on 9 November 2005, p. 6 (http://www.cer.be/files/McKinseyFINAL-164934A.pdf).

11 Eurostat, http://epp.eurostat.ec.europa.eu/portal/

12 Eurostat, http://epp.eurostat.ec.europa.eu/portal/

In the realm of passenger transport, the market shares of the various modes of transport have remained fairly stable. There is, however, a continuing slight shift towards road transport in this category too (Figure 5).

The absolute and relative *growth in the volume of road and air transport* has a powerful impact on the increase in transport-induced CO_2 emissions, since the specific CO_2 emissions from road and air traffic are considerably higher than those from rail traffic. According to a study conducted by the German pro-rail group *Allianz pro Schiene*, an alliance of environmental and transport associations, the specific CO_2 emissions from private cars are 2.1 times higher than those of a passenger train (Figure 7). Road-haulage vehicles have no less than four times the climatic impact of a freight train (Figure 6). The study, like others before it, shows the impact of air transport to be considerably more harmful than that of either road or rail transport. To maintain and increase further the climatic benefit of rail transport over cars and lorries, the railways must also become even more energy-efficient. Railways with electric traction can even be run with virtually no carbon footprint if they use power from renewable energy sources such as wind, sun, water power or geothermal power. The European railways must, however, do something to increase the proportion of renewable energy sources used for rail power. The plan by the German rail operator Deutsche Bahn AG to replace nuclear power by coal-based electricity is, however, counterproductive in this context.

The growth of *passenger transport* has now slowed down in Western Europe, whereas the process is still in full swing in Central and Eastern Europe as the new Member States try to bring their economies up to Western standards. The greatest degree of convergence has been achieved in eastern Germany. In some of the eastern *Länder* the car-ownership ratio even exceeds the average for the old Federal Republic.

In the realm of *freight transport* the signs point to continuing growth, particularly because of a steady increase in the distances covered by haulage operations. Admittedly we are currently seeing a decline in transport activities as a result of the worldwide economic crisis, but this will very probably only be a blip in a steady prolonged period of growth, since the principles underlying worldwide economic activity will not change. The following are among the reasons for this growth:

- a sharp increase in the flow of goods because of the single European market,
- strong export orientation of Member States' economies, while the EU is also a major market for imports from other parts of the world,
- reduction in manufacturing industry of vertical ranges of manufacture, necessitating the delivery of more and more primary products from all parts of the world ('global sourcing'),
- 'just-in-time' logistical strategies involving the minimisation of storage capacity in sales outlets and production plants in favour of last-minute haulage operations, and
- transformation of the retailing structure from a host of small shops to large chains, leading both to an increase in the movement of goods and to the establishment of large shopping centres on greenfield sites, which are almost inaccessible without a car and therefore increase the volume of shopping traffic.

The flexibility that is needed to cope with these new requirements, particularly with regard to consumer goods, can best be provided by road haulage. The inherent advantage of road transport lies in the unrivalled development of the road network, which means that a lorryload of citrus and tropical fruits from

Spain, for example, can be taken direct to the wholesale market in Poland without the need for trans-shipment.[13] Its other great competitive advantages lie in low wage levels, particularly in the new Member States, and in inadequate social protection and supervision of drivers. In particular, the road-haulage industry is not yet required to pay its own social costs, most notably in cases where the damage it causes to health and the environment is not factored into HGV tolls.

Cross-border rail freight in Europe, by contrast, is hampered by the fact that there are still five different track gauges, six different electrical power systems, eight pantograph systems, seven signalling systems, more than 20 train-control systems, four loading gauges, five railway communication systems and a host of non-harmonised rules and regulations, which almost invariably necessitate a change of engine and driver when trains cross national borders. Because of the lengthy waiting times this entails, the average speed of cross-border goods trains is only 10 mph. The market in transport of bulk goods, an area in which road haulage cannot compete, is shrinking. Besides, on many major routes this market is shared with inland-waterway and coastal-shipping operators.

Air transport quickly recovered from the events of 11 September 2001 and the SARS crisis in Asia, and is now setting new records for total passenger and freight miles every year, latterly with year-on-year growth rates at about 5%. Here too the economic crisis has led to a short-term decline in passenger numbers, but the pattern is not expected to be very different from what it has been after previous international crises. In the light of the current fall in passenger numbers as a result of the banking and worldwide economic crisis, it should also be borne in mind that the decline is not due to a change in people‘s mobility patterns, so it will quickly be replaced by similar growth rates similar to previous ones. Additional highly attractive offers from the major airlines are a contributory factor, as are those of the low-cost carriers that have been creating a furore in the sphere of passenger air transport for several years. They frequently offer internal European flights for a few euros, for example, and, astonishingly, even make money from this in some cases. They are sometimes aided and abetted by unfair competitive advantages deriving from low handling charges, which are generally state-subsidised, at regional airports. In addition, these airports pay direct subsidies in the form of so-called marketing grants for the opening of new air routes. Moreover, even today public treasuries still meet the cost of building and maintaining transport access to airports. In its study on the expansion of regional airports in Germany, Deutsche Bank Research refers to public subsidisation in the form of investment grants and operating subsidies amounting to €9.20 for each air traveller, whereas the major airports are only subsidised to the tune of €0.50 per passenger.[14]

Air freight traffic is also growing fast: in the EU-25 it rose by 6% between 2006 and 2007.[15] Although air freight accounts for only some 1% of the volume of all international transport, it earns an estimated 40% of the total value of international freight transport.

International shipping, and particularly container services, have been enjoying a boom over a number of years as a result of the division of labour within the global economy. Even if shipping vastly outperforms road haulage in terms of low CO_2 emissions per unit of weight, the exponential growth in intercontinental trade in goods, especially between Asia and Europe, is contributing more and more to the total volume of CO_2 emissions. An estimated 40% of all tonne-kilometres of freight transport in the 15 older Member States are ascribable to sea shipping. Wage and carriage costs are so low that it is cheaper, for example, to ship Australian coal halfway round the globe to Europe than to extract coal from the seams in the Ruhr coalfield or in Lorraine.

13 The cost of road haulage is so low that it is worth sending North Sea shrimps by refrigerated lorry to Morocco for peeling, then bringing them back to be sold at the fish market in Hamburg.

14 Deutsche Bank Research: ’Expansion of regional airports: misallocation of resources’, in Current Issues, 18 November 2005, p. 1 (http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000193311.pdf).

15 Eurostat, http://epp.eurostat.ec.europa.eu/portal/

Inland waterway transport accounted for 5.3% of freight transport in the 27-member EU in 2006. The main artery, carrying 80% of all inland waterborne freight in Europe, is the Rhine, the primary role of which is to serve as a link with the hinterland for Rotterdam, Europe's largest port. Inland waterway transport is heavily weather-dependent. When the river is too high, too low or iced over – which is the case for about four months of the year – vessels are immobilised. Where timely delivery is crucial, as in the case of container goods, this means that, alongside the road next to a river, there must also always be a parallel rail infrastructure with the capacity to carry extra freight in such cases.

The recurring calls for rivers and canals to be developed to take vessels the size of Rhine barges are misguided, especially in view of the increase in extreme weather conditions associated with climate change. Instead of investing in widening, straightening and deepening rivers, it would be better to renew the fleet, which is 15 years old on average, and adapt it for use on the existing river system. At the same time, the environmental standards of inland vessels must be considerably enhanced, which must also involve the retrofitting of serviceable vessels. This is one of the main aims of the Commission's action programme Naiades (Navigation and Inland Waterway Action and Development in Europe).[16]

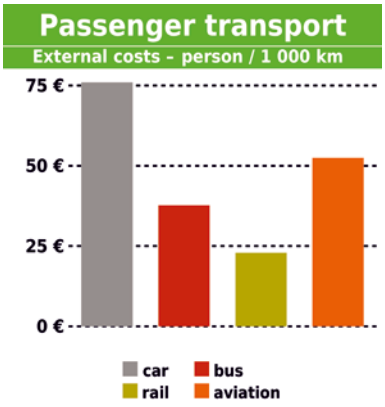


Fig. 8: The true costs of passenger transport: Travelling by car is about three times more expensive than by rail.

THESIS 4: **Transport pricing does not tell the environmental truth, because social costs are not factored in. This, along with selected tax subsidies, especially for air transport, distorts competition between modes of transport to the detriment of the railways.**

The social cost of transport operations chiefly encompasses costs arising from accidents, atmospheric pollution, damage to the climate and to public health, noise, impairment of natural resources and the landscape and damage to buildings. A study covering the 15 older EU Member States plus Norway and Switzerland[17] provides hard and fast numerical evidence. It puts the social cost of the use of private cars at €76 per 1 000 passenger-kilometres (pkm), which is more than three times the social cost of rail travel (€22.90 per 1 000 pkm). Travel by bus and plane, at €37.70 and €52.50 per 1 000 pkm respectively, both generate lower social costs than the use of a private car (Figure 8).

The differences are even greater for freight transport. The transport of freight by rail generates social costs of €17.90 per 1 000 tonne/kilometres, which is less than a quarter of the social costs generated by HGV traffic (€71.20 per 1000 t/km). Compared with deliveries made by light utility vehicles (€250.20 per 1 000 t/km) and air transport

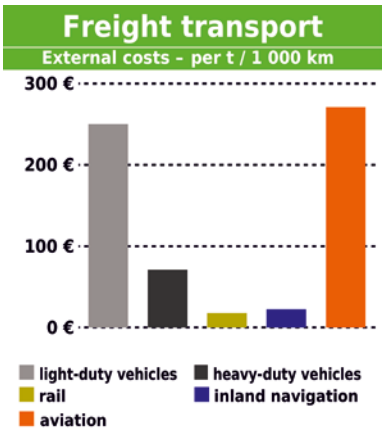


Fig. 9: The true costs of freight transport: Air transport is 15 times more expensive than rail transport, while transport by light-duty vehicles costs 14 times and by heavy-duty vehicles more than four times as much as rail.

Source: Infras/IWW 2004 I: External Costs of Transport – Update Study, im Auftrag der International Union of Railways (UIC), Final Report, Zürich/ Karlsruhe.

16 See COM(2006) 6 final dated 17 January 2006: Communication from the Commission on the promotion of inland waterway transport: Naiades – an integrated European action programme for inland waterway transport. http://ec.europa.eu/transport/iw/doc/2006_01_17_naiades_communication_en.pdf

17 Infras/IWW: External Costs of Transport - Update Study, commissioned by the International Union of Railways (UIC), Final Report, Zürich and Karlsruhe, 2004.

(€271.30 per 1 000 t/km), the social cost of rail transport is 14 or 15 times lower. At €22.50 per 1 000 t/km, transport by inland waterway generates social costs that are 11 or 12 times lower (Figure 9).

In accordance with the principles that users should pay the cost of transport, that prices should be a true reflection of cost and that modes of transport should compete on a level playing field, the social costs arising from each mode of transport should gradually be shifted onto its users. Such a gradual redistribution of social costs by means of appropriate levies or excise duties will not only lead to fairer pricing, since those who generate these costs will finally have to meet them, but will also enhance the competitiveness of the more environment-friendly rail system in the European transport market.

Competition between rail and air continues to be grotesquely distorted by exorbitant tax subsidies for air transport, which is neither subject to an energy tax (kerosene duty) like rail and road transport, nor are cross-border flights subject to VAT. There is no logical economic or regulatory reason for the historically rooted and long-outdated fiscal privilege enjoyed by one particular mode of transport. Its abolition throughout Europe is long overdue.

THESIS 5: **The planning of transport infrastructure by the Member States, and more especially by the EU itself in the form of Trans-European Network (TEN) projects, is hopelessly underfunded and is still based in some cases on the pursuit of the wrong priorities, with expensive showcase projects being put before efficient transport systems, hardware before software and the construction of new railways before the upgrading of existing lines.**

If Europe intends to make progress in protecting the climate from the impact of transport operations, there must be a renaissance of Europe's railways. The example of the United States demonstrates convincingly that it is possible for a highly industrialised country to move a large percentage of its freight by rail. More than 40% of goods are now carried by rail in the United States, as against a diminishing average of some 16% in the 27 EU Member States. The secret of the United States' success lies less in the existence of a perfectly developed infrastructure than in the fact that long-distance trains are not hampered by national borders, different track gauges or incompatible train-control and signalling systems.

Accordingly, the EU has recognised the urgent need to remove all of these obstacles. In a number of legislative 'railway packages', measures designed to harmonise European rail transport with a view to achieving 'interoperability' have been adopted and are being implemented in stages.

Besides this very important 'soft' infrastructure, however, there is also a lack of 'hard' infrastructure in the form of well-developed railway lines. This applies especially to lines linking the new Member States with the older ones. On some routes, trains cannot even match the speeds at which steam trains used to operate before the Second World War. The train journey from Berlin to the Estonian capital, Tallinn, for example – a distance of 1 700 kilometres – took 60 hours in the year 2000; passengers had to change nine times and cross the border between Latvia and Estonia on foot. In 2009 the time has at least been reduced to 35 hours, but in 1935 the same journey could be made by steam train in 27 hours – still much less time than it takes now.

The European Union is certainly aware of the problem. Its Trans-European Transport Networks (TEN-T) are intended to improve the situation. The budget for the development of the entire network of trans-European railways, which is to have a total length of some 94 000 kilometres by 2020, including 20 000 kilometres of high-speed lines, and of the network of trans-European roads, with a total target length of 89 500 kilometres, amounts to more than €600 billion.

The bulk of the construction and development measures planned and prioritised by the EU relates to the rail network, with 12 500 kilometres of new lines and 12 300 kilometres of upgraded lines. The TEN plans also provide for improvements to the road network, comprising the construction of 4 500 kilometres of new roads and the upgrading of a further 4 800 kilometres. The budget also covers the development of inland waterways, of short sea shipping and of the European satellite-based navigation system Galileo.[18] Since most intercontinental freight is transported by ship, great importance attaches to the ship/rail interface, where Europe is still far from adequately equipped.

For the first 14 TEN-T projects adopted at the Essen summit of the European Council in 1994, 90% of the cost of each project was to be paid from the relevant national budgets, and the remaining 10% was to be funded by the EU. This distribution of the financial burden is probably one of the main reasons why a grand total of three TEN projects have been completed to date. For this reason, the grant element for priority projects was increased to 20% as part of a revision of the TEN guidelines, and 50% part-funding from the EU budget will even be provided in future for cross-border sections. The snag in all of this is that the EU budget is far from able to meet these commitments.

The list of priority TEN projects contains a total of 30 construction projects, including the 14 'Essen projects', and the latter alone, according to figures communicated by the Member States in 2005, will cost €252 billion. Coordinators have been appointed for six core projects – five rail axes plus the development of the standardised European Rail Traffic Management System (ERTMS) for installation on a defined core trans-European network with a total length of some 20 000 kilometres. Under the hard-won agreement on the Financial Perspective for the EU budgets from 2007 to 2013, however, even these six projects are underfunded, let alone the others, foremost among which are the east-west links between the old and new Member States. Instead of the €20.35 billion proposed by Parliament and the Commission, the budget for the TEN-T projects was cut by two thirds to €7.2 billion. The implementation of most of these projects has thus become an impossible dream.

If the TEN list is not to remain a Utopian wish list as a result of this drastic pruning, two things are needed. The first is another critical review of the transport projects with prioritisation of a core network as proposed in the Lichtenberger report on the Green Paper on the future TEN-T policy[19], and the second is serious reflection for the purpose of identifying additional ways of funding the development of a viable and environmentally compatible European transport infrastructure. In particular, major showcase projects should be subjected to very critical scrutiny. The six core projects alone, for example, include the Brenner base tunnel, the tunnel on the proposed rail link between Lyon and Turin, the bridge over the Strait of Messina and the Fehmarn Belt bridge between Germany and Denmark – four highly controversial and disproportionately costly projects whose benefit to the transport system is far outweighed by their prohibitive environmental and economic cost (for further details, see subsection 3 D on pages 35 *et seq.* below).

Subsection 3 C, on pages 29 *et seq.* below, deals in detail with new funding methods that would be desirable in terms of both transport economics and environmental protection.

18 European Commission, Trans-European transport networks. TEN-T – priority axes and projects 2005, Brussels, 2005, pp. 7 et seq. See http://europa.eu.int/comm/ten/transport/projects/doc/2005_ten_t_en.pdf

19 http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A6-2009-0224+0+DOC+PDF+V0//EN

2 Aims: breaking the link between economic and transport growth, defining the target for the switch to rail and reducing the volume of CO_2 emissions from transport

It is a declared aim of the EU to break the link between economic growth and growth in the volume of transport operations. In real terms, however, the 27-member EU has made little progress over the past few years. In the domain of freight transport, the situation has remained static since 1995, while passenger traffic has fallen slightly, by about 3.5%. In the new Member States, where economic growth is comparatively high, more tangible success has been achieved in breaking this link, success that is due in part to the rapid growth of a previously underdeveloped service sector, which is less transport-intensive than agriculture or industry.

The defined objective of breaking the link between economic growth and transport growth, however, centres on a relative value and as such has limited use as a means of achieving the goals of EU environmental and climate policy. The fact is that an expanding economy and a transport sector which is growing slightly more slowly would still combine to keep driving up energy consumption and the associated emissions.

The Joint Expert Group on Reduction of Energy Use in Transport, a working group under the Joint Expert Group on Transport and Environment (JEGTE), compiled a report[20] for the European Commission which contains a comprehensive catalogue of objectives and measures.

The first measure it proposes is the setting of national targets for the reduction of energy use in transport by the target year of 2020. These should be accompanied by national action plans. The report refers to the aim set out in the German Federal Government's national sustainability strategy of a 20% reduction in transport intensity in the realm of passenger transport (ratio of passenger/kilometres to GDP) and a 5% reduction in freight transport intensity (ratio of tonne/kilometres to GDP) in relation to 1999 levels.

This aim of breaking the link between economic growth and transport growth, however, is only a relative objective, and its achievement will not necessarily mean a fall in emissions of climate gases, because it merely measures the relationship between two trends.

It is therefore more appropriate to apply reduction targets to the volume of CO_2 emissions from transport operations.

A CO_2 reduction target of 10% for road traffic was introduced in the Netherlands in 1990 for the period from 1986 to 2010. In the year 2000, however, the Government distanced itself from this target since it was in danger of being missed and because specific measures in pursuit of this target had been avoided for political reasons.

As a target value for the reduction of the volume of CO_2 emissions in transport, we suggest that the EU should set itself the aim of reducing these emissions too by 8% in the medium term, i.e. by 2012, regardless of the state of play in other sectors. The EU Member States should then set aims for 2020 and

20 This report is available on the Web at:
http://www.umweltbundesamt.de/verkehr/downloads/reduction-energy-use-transport.pdf

conclude a binding agreement whereby the volume of climate gases from transport operations in the EU as a whole is reduced by 30% in relation to the base year 1990.

In our view, a necessary enabling objective for the achievement of a reduction in CO_2 emissions is a shift in the modal balance from the modes of transport with the highest climate-gas emissions, namely cars, utility vehicles, HGVs and aircraft, to the modes that are least harmful to the climate, i.e. rail, inland waterways, coastal shipping and inner-city cycling. As an environmental benchmark, the EU should therefore set itself the target of an annual 1% shift in the modal split in favour of the more climate-friendly modes of transport and should structure all of its transport-related action accordingly. Such a targeted shift would also help to ensure that the annual 1% increase in energy-efficiency agreed by the Council in March 2006[21] is applied in the transport sector.

21 Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services

3 Action: stepping stones on the way to climate-friendly transport

What action can be taken to achieve these aims?

Borrowing from and supplementing the catalogue of measures recommended by the aforementioned Joint Expert Group, we propose the following steps as mandatory action for the reduction of energy consumption in transport operations:

1. From the Greens' perspective, *traffic reduction* is the foremost priority. Limitation and reduction of the volume of traffic on the roads can be achieved by improving haulage logistics with a view to avoiding unladen journeys – as has been achieved in Switzerland, for instance, following the introduction of the mileage-based heavy-vehicle levy (LSVA) there – and by pursuing an appropriate infrastructure policy. Such a policy includes, for example, supplying conurbations with locally sourced regional products, as in the Food Campaign launched in London by Ken Livingstone and Jenny Jones, and urban planning based on the aim of minimising the distances people have to travel, combined with clear priority for public transport.

2. *Increasing the energy-efficiency of vehicles:* technical measures should be taken to reduce the specific energy consumption of each individual means of transport.

3. *Optimised choice of mode:* each kind of transport operation should be carried out using the mode of transport with the highest level of energy-efficiency (modal shift).

4. *Increasing the vehicle utilisation rate* per vehicle/kilometre: each operator should make the most logistically efficient use of available carrying capacity.

5. *A reduction in journey distances and transport requirements* can be achieved by strengthening regional economic processes and ending support for misguided location policies that result in wide dispersal of the production chain.

6. *More energy-efficient behaviour* at the wheel: systematic training should be given in ecodriving, i.e. driving in such a way as to minimise fuel consumption and emission levels.

7. *Improved logistics:* the organisation of the freight transport chain and passenger transport connections should be optimised to permit the most efficient modal mix (intermodality).

8. *Mobility card* for public transport: a European standard should be developed for a customer-friendly, easy-to-use system of public passenger transport with additional mobility-enhancing features for individuals.

These measures can be influenced by various political management instruments, which can be categorised as follows:

- regulatory measures, such as the setting of maximum values;

- political action to provide support and encourage research in the field of transport infrastructure (e.g. promotion of urban mobility);

- political measures relating to pricing (excise duties, levies and withdrawal of subsidies);
- infrastructure measures, such as Trans-European Network projects.

Changes in people's mobility patterns and in freight transport can also result from factors that are not open to political influence or are the intended or unintended consequences of political management measures. A sharp increase in the price of oil, for instance, is very likely to affect people's transport choices. Demographic and economic trends in the Member States will also have a decisive influence on the general development of the transport situation. Regardless of these factors, our strategy paper identifies measures that will, in any event, contribute significantly to a lowering of traffic climate-gas emissions.

In the following subsections, we focus primarily on measures that can be made compulsory through political action on the part of the EU and can therefore radically change the conditions in which passenger and freight transport operate within the Union.

At the same time, we are aware that, because of the complex decision-making processes involving the Commission, Parliament and the Council and the fact that voting on many of the proposals made below is subject to the unanimity requirement in such important bodies as the Economic and Financial Affairs Council (Ecofin), a great deal of persuasion is still needed.

3 A Regulatory measures

Environmental policy standards creating a level and plannable playing field for all participants in the market can be set by means of regulatory provisions. The introduction and gradual tightening of the European pollutant standards for passenger cars have proved to be an extremely effective means of drastically lowering the volume of pollutant emissions from road traffic. That has not, however, been the case so far for emissions of climate gases which are not subject to maximum values.

The greatest contribution at the lowest cost, which would also be the quickest to implement, would be made by measures focused on vehicle efficiency, targeting both the technological efficiency and the efficient use of present means of transport. Since passenger cars and commercial vehicles account for such a high percentage of the total volume of traffic in the EU, the reduction of fuel consumption by road traffic, also leading to a reduction in CO_2 emissions, is the most important of these measures.

(A 1) **CO_2 emissions from road traffic and fuel consumption should be reduced by means of ambitious maximum values.**

The European Automobile Manufacturers' Association (ACEA) promised the European Commission that it would reduce the average CO_2 emissions of new passenger cars sold by its member companies to 140 grams per kilometre by the year 2008. This is equivalent to a fuel-consumption rate of 5.8 litres per 100 km (48.7 mpg) for petrol engines and 5.3 litres per 100 km (53.3 mpg) for diesel engines. The association of Japanese manufacturers, JAMA, and the Korean association, KAMA, intend to achieve that target one year later.

It is now clear that this voluntary commitment has not been met. According to a study commissioned by the European Federation for Transport and Environment (T&E),[22] in 2007 average CO_2 emissions fell by only 1.7% from 160 to 158 grams per kilometre. While French manufacturers, at 143 g per km, and Fiat, at

22 See http://www.transportenvironment.org/Publications/prep_hand_out/lid:513

141 g per km, are on task in terms of the voluntary commitment, German manufacturers still have an average consumption of 168 g per km, so they are responsible for the failure of the voluntary commitment. This is partly due to growing sales of German-made sports utility vehicles (SUVs) in the wake of aggressive advertising, while fuel-efficient cars like the 3L VW Lupo have been taken out of production. The only manufacturer with plus points is BMW, since the introduction of an efficiency package in all its new vehicles led to a 7.3% reduction in average emissions in 2007 alone, albeit from a high level. BMW also claims that it is set to achieve a similar reduction this year. This shows that German manufacturers are also capable of producing cars with a much lower fuel consumption when they put their mind to it.

In 1995 the EU Environment Council, which included the then German Environment Minister Angela Merkel, adopted a CO_2 target of 120 grams per kilometre, which was originally to apply from 2005. The target year was postponed to 2012 after the car manufacturers were unable to meet the voluntary commitment they had adopted for 2008. In December 2007, the European Commission then adopted a proposal for a directive introducing a ceiling for CO_2 emissions from passenger cars and light-duty vehicles,[23] according to which new passenger cars must not exceed average CO_2 emissions of 120 g per km by 2012. For 2020 the aim is to achieve a ceiling of 95 g per km.[24] In fact, engine emissions only have to be reduced to 130 g per km, and a further credit of 10 g per km is allowed for additional measures such as low-resistance tyres, more efficient air-conditioning systems or the possibility of using biofuels. The ceiling will be based on vehicle weight, so the heavier the vehicle the more CO_2 it may emit. As the range of vehicles offered by manufacturers differs, the ceiling will vary considerably. For example it will be 122 g per km for Fiat and 138 g per km for Daimler.

Although this proposal is weaker than the EU‘s long-term target and although German manufacturers are allowed to emit more CO_2 from their larger and heavier cars than Italian and French manufacturers, the German Government has succeeded in gaining an even greater concession for German manufacturers. At a meeting of the European Council on 11 December 2008, the Heads of State or Government adopted the CO_2 directive for passenger cars, according to which the already lax maximum values are not to be fully in force until 2015 (a procedure known as phasing-in) and the manufacturers‘ maximum CO_2 value is to be credited for as yet unspecified ‚eco-innovations‘. The average target CO_2 ceiling in 2012 will therefore be 162 g per km, which is higher than the average maximum value for 2007! Even in 2015 the maximum value will not be far below the reducing trend of the past few years. The follow-on maximum value for 2020 is relatively ambitious, at 95 g, although there is to be a review in 2013, when the level of the 2020 maximum value can also be reconsidered. The penalty payments of 95 euros per vehicle and gram for failure to comply with the maximum value are also to be drastically reduced in the first few years, yet it is vital for the penalty payments to be high enough to give the manufacturers a clear economic incentive to keep below their ceiling by introducing suitable technical measures.

As a result of the many loopholes and inadequate penalty payments, the CO_2 ceilings will not spur manufacturers on to produce much more economical cars in the coming years, and this will have a direct impact on the attainment of climate targets in the transport sector. The position taken by the European Greens was a CO_2 ceiling of 120 g from 2012 and 80 g CO_2 from 2020 without credits for additional measures. According to a Transport & Mobility Leuven study on behalf of Greenpeace[25], this proposal would have allowed a saving of 130 million tonnes of greenhouse gas equivalents in the EU in 2020 compared with a business-as-usual scenario, that is to say a scenario without CO_2 ceilings. The Commission proposal only arrived at a reduction of 32 million tonnes. With the diluted measures now adopted emissions will reduce at the same rate as they would without CO_2 ceilings.

23 http://ec.europa.eu/environment/air/transport/co2/co2_home.htm

24 For light-duty vehicles, which will not be discussed further below, the CO_2 ceiling is to be 175 g/km in 2012 and 160 g/km in 2015.

25 http://www.tmleuven.be/project/greenpeace/20080828Greenpeace_CO2_Targets.pdf

If the instrument for achieving climate-protection targets is to be effective, an ambitious maximum value has to be adopted now for 2012 and 2020. A large proportion of the cars that will be on the road in 2020 will have been manufactured in the years from 2012. Only by promptly setting the ceiling for 2020 will there be planning certainty and long-term incentives for innovative leaps in automotive engineering, such as could be achieved with electric cars running on green electricity, for example. We are therefore calling for the CO_2 ceiling for 2020 to be tightened up to 80 g per km without loopholes. In 2012 an ambitious follow-up maximum for 2030 should also be set at a level that will enable the EU's long-term climate-protection targets to be met in the road transport sector.

Contribution to the reduction of CO_2 emissions from transport operations: medium

(A 2) **Improvement of the technical rules governing energy-saving devices in vehicles could create additional energy-efficiency potential.**

In some cases, it would only take small amendments to statutory regulations to achieve quite large reductions in CO_2 emissions. For example, low-resistance tyres and friction-modified lubricants have long been on the market but are not universally used, because there is no obligation to do so.

Friction-modified lubricants are synthetic oils with additives which possess particularly good lubrication qualities (low viscosity). This reduces friction in the engine, which has a direct impact on fuel consumption. The mileage per gallon attainable with conventional lubricants can be increased by two to five per cent by switching to a friction-modified oil.

As a first step, we propose that a standard, such as an eco-label, be established for these low-viscosity engine oils and that the standard then be made mandatory.

Low-resistance tyres have lower rolling resistance than conventional tyres. The saving on fuel consumption is in the order of 2% to 9%. A great deal of energy can also be saved if tyre pressures are correct. Driving with underinflated tyres reduces the life of the tyres, increases the risk of accidents and increases fuel consumption by two to four per cent. For this reason, low-resistance tyres should be prescribed as standard. In addition, after a transitional period, all new vehicles should be fitted with a tyre-pressure indicator. This will bring twofold benefits by cutting fuel consumption *and* increasing road safety.

Contribution to the reduction of CO_2 emissions from transport operations: high

(A 3) **Ecodriving: energy-efficient driving technique can be encouraged by compulsory cost and consumption indicators in new vehicles.**

One of the greatest potential sources of energy-efficiency is the driving technique of each individual motorist. Up to 25% of fuel consumption can be saved through the use of efficient driving methods. On the one hand, such methods have to be learned; on the other, they need continual positive reinforcement.

Driving schools throughout the EU must be required to adjust their curricula so that learners are taught how to drive in an energy-efficient manner. We also propose that every new car sold in the EU should come with a voucher for free training in fuel economy. In addition, after a transitional period, all new vehicles should be equipped with a consumption indicator, which would display their current rate of fuel consumption. In order to make the feedback to drivers even more effective, a permanent 'online' display should show the cost implications of the rate at which their driving technique is causing the vehicle to

consume fuel. Whenever the driver unlocked the petrol cap, he or she would be prompted to enter the price of the fuel dispensed at the pump into the on-board computer, which would display the price per litre multiplied by the current level of consumption. It is also conceivable that a particularly aggressive driving technique could trigger a warning tone, similar to the tone that is widely used today to signal that a seat belt has not been fastened. Fuel-economy training courses should be compulsory for anyone who drives for a living.

Contribution to the reduction of CO_2 emissions from transport operations: medium

(A 4) Biofuel quota: only justifiable with sustainable production

There has been a dramatic about-face in the biofuels debate in the past few years. Until recently biofuels were lauded as a major hope for greater climate protection, continuity of supply and the enhancement of wealth creation in rural regions, but now they are being denounced as responsible for worldwide food price hikes and for the destruction of the rainforest.

Sustainably produced biofuels can at least contribute to greater climate protection and help to reduce our dependence on oil, but they are no substitute for a comprehensive strategy for the more efficient use of energy in the transport sector. Consequently, there must be verifiable criteria for biofuels, so only the use of biofuels with a demonstrable CO_2 reduction and not involving any ecologically irresponsible changes of land use should be allowed in the future.

As part of the EU objective of increasing the share accounted for by renewable energy sources to 20% by 2020, at least 10% is to be from renewable energy sources in transport. This does not need to be confined to biofuels: the use of renewable electricity also counts towards the quota in the transport sector. This means not only the electric car but also the increase in the renewable energy share accounted for by traction power, as emerged from a call to the Commission from the German rail operator Deutsche Bahn AG.

The use of biofuels is also subject to strict sustainability criteria, according to which the reduction in greenhouse gas emissions from the use of biofuels must demonstrably be at least 35% initially, then at least 50% with effect from 2017, and at least 60% for new production installations from 2017. Biofuels must not be made from raw materials obtained from land with high biodiversity value or with high carbon stock, including tropical forests, wetlands, peatlands and even natural or non-natural grassland.

Contribution to the reduction of CO_2 emissions from transport operations: medium

3 B Action to provide support and encourage research

Besides regulatory, fiscal and infrastructure-related measures, the EU can also do a great deal to contribute to a climate-friendly transport structure by supporting research and demonstration projects and by establishing market-based incentive programmes. In the framework of the Marco Polo programme, for example, very successful action has been taken since 2003 to promote the creation of new intermodal freight-transport chains. For the next funding period, from 2007 to 2013 (Marco Polo II), the Commission has asked for €740 million. How much of that amount will actually be made available on the basis of the agreement on the Financial Perspective remains to be seen, and a certain degree of scepticism seems to be warranted.

Great potential for the reduction of climate gases is also offered by alternative forms of propulsion and fuels and by environment-friendly multimodal urban-transport strategies. The main channel through which the EU can encourage innovation in this field is its support of relevant projects through the Seventh Framework Research Programme (2007-2013).

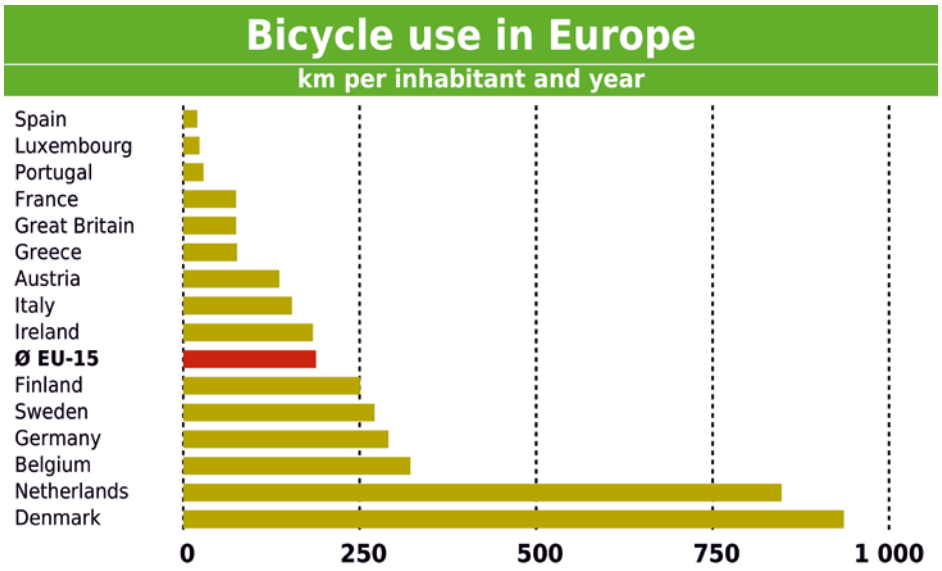
(B 1) **Urban passenger transport should be as clean and quiet as possible and should include intermodal services with user interfaces that possess uniform elements.**

Some 80% of the population of the EU live in densely populated conurbations. Many cities possess thoroughly attractive systems of local passenger transport, albeit with scope for further improvement. Bicycles are the ideal form of transport for distances up to five kilometres, but their utilisation varies widely. Whereas bicycles account for 27% of total mileage in the Netherlands, where the average distance cycled per inhabitant in a year exceeds 1 000 kilometres, far less use is made of bicycles in most other countries with similar geographical and economic conditions.

Far more short car journeys in particular could be made by bicycle or on foot instead. Ten per cent of car journeys are shorter than a kilometre, 30% are shorter than three kilometres, and 50% are shorter than five kilometres. Thus there is enormous potential here for more environment-friendly mobility patterns.

Fig. 10: Every Dane cycles on average 936 km per year, the inhabitants of Germany only 291 km.

Source: European Environmental Agency 2007



Even in towns and cities, the car often remains the primary means of transport. As Germany's experience with ecotax, for example, has illustrated, cost alone has a relatively low impact in determining a person's transport choices. It is already cheaper in many cases to take the train instead of travelling by car, and in view of rising oil prices this can even apply to families too. Public transport, however, is often considered to be a greatly inferior option in terms of reliability and availability. This is what new intermodal mobility strategies have to address. They must be based on an acceptance that the private car is the benchmark and create an intermodal system that can stand comparison, at least in terms of functional equivalence but ideally in terms of standards of comfort too.

The prerequisite for an intermodal transport system is a very well-developed public-transport network which would serve as the backbone of the system and would be supplemented by other facilities designed to enhance individual mobility, such as car-sharing and bicycle hire. The aim, in other words, is to develop *innovative approaches to public transport* in conurbations, especially the most densely populated areas where traffic-related problems, such as atmospheric pollution, noise and congestion, are greatest. It remains a priority political task to guarantee the funding of a modern and flexible system of public transport. Proactive spatial planning and urban-development policies must restore the appeal of inner cities as places to live.

A cost-effective and very efficient approach is the *promotion of bicycle and pedestrian traffic*. Half of all car journeys in the EU are shorter than five kilometres, and one in ten is shorter than a kilometre. A large percentage of these journeys could be made by bicycle or on foot. This would save a great deal of fuel and hence cut CO_2 emissions, because cold starts mean double fuel consumption in summer and even triple consumption in winter as well as the corresponding emission volumes. Taking Germany as an example, even if only 30% of car journeys below six kilometres were replaced by bicycle trips, this would lead to a 4% reduction in CO_2 emissions from road traffic.[26]

Bicycle hire schemes are found in more and more European cities, one particularly successful one being the Paris Vélib system[27] introduced under the management of Denis Baupin, a Green responsible for the mobility sector. Since 2007, 20 000 bicycles have been made available for hire at some 1 500 self-service points, of which there is one roughly every 300 metres. The annual charge is 29 euros, for which a bicycle can be hired free of charge for up to half an hour a time an unlimited number of times. If the bicycle is used for longer, additional charges apply. The scheme has been hugely successful. By May 2008, 190 000 subscribers had registered, and the bicycles were hired out over 20 million times within a 10-month period. The successful principle is now to be extended to electric cars as well, so according to the Mayor of Paris, Bertrand Delanoë, 4 000 electric cars are to be made available at 700 self-service points from late 2010.

All-in-one intermodal travel-pass cards, such as the German *MobilCard*, are an important tangible symbol of a coordinated multimodal approach to transport. A successful example of such a scheme, entitled *HANNOVERMobil*, was launched in the city of Hanover in November 2004. In the medium term, such card systems should be rolled out across Europe, providing people with the widest possible selection of transport options (bus, suburban train, inter-city train, aircraft, taxi, car-sharing, car rental, bicycle hire, etc.). Innovative pricing models are also needed for these systems to ensure that a charge is only incurred if the selected means of transport is actually used. Instead of the system used in local public transport networks in which tickets or travel cards are bought in advance and are valid for a specific period, *MobilCard* holders receive variable invoices based on the best available prices for the services they have used.

The German rail operator Deutsche Bahn AG is preparing to become the first national mobility provider in Germany by offering its passengers the opportunity to buy a rail ticket, known as a *CityTicket*, which entitles them to travel on from the station to their final destination free of charge by urban transport, or to use its own additional mobility services, *DB Carsharing* and *DB Call a Bike*.

Another key element takes the form of *multimodal information systems*. Third-generation mobile telephony (UMTS) opens up new possibilities in this sphere, because it will facilitate the widespread use of portable navigation systems for bus and train passengers, who can obtain reliable and fast information on the best route at all times.

26 Figures as published in JEGTE, 2006, p. 46.

27 http://www.velib.paris.fr/

Among the advantages of such technological aids is that they make public transport, for example, a practical option for new user groups to whom it has hitherto been theoretically available but who have tended not to consider using it. Real-time information in mobile terminal equipment in the hands of passengers or on displays at stations and bus or tram stops also provide reliability. Irrespective of what the timetable may say, the display will 'keep its promise' if it indicates, for example, that the tram or bus will arrive in three minutes.

The EU can and must support this development by such means as the establishment of the global navigation-satellite system Galileo. There is also a need, however, for targeted EU support for demonstration and pilot projects relating to the use of these ICT applications in intermodal passenger transport.

Creating links and interfaces between modes of transport is not only a matter of better information but also requires the removal of physical barriers for people with reduced mobility, such as wheelchair users, parents with prams and people with disabilities. In addition, information systems must be available for those who do not have a mobile phone or who cannot use such technology; these systems should include personal service at railway stations, easily readable and comprehensible ticket machines and unambiguous signposting systems. This is especially important in the light of demographic trends in Europe.[28]

The European standardisation of information systems for passengers is an important task for the future. If people have to learn how to use the local transport system in every new city they visit, and if transport systems are not easily understood by strangers, many of them will opt to travel by car and be guided to their destination by the on-board navigation systems that are already in fairly common use. For this reason public transport needs a user interface that is simple and standardised in the same way as traffic signs on our roads. What has already become possible through the definition of passengers' rights should be extended to the important domain of customer information. In the initial stages, however, it can only be a matter of additional information systems designed to prevent the exclusion of user groups with no knowledge of information technology.

Parking regulations in many cities have made people switch to public transport, because daytime parking charges have become too expensive for those who work in city-centre locations. These charges, however, are still far too low in many cases. In American cities such as New York and Chicago, motorists often have to pay eight dollars to park for half an hour and 20 dollars or more to park for the whole day – a nightmare for European motorists which has not only become reality in the United States but is also accepted.

Various cities in the world have experienced great improvements in inner-city traffic management by introducing congestion charging, whereby motorists driving into the central area of the city are required to pay a toll. In London, for example, the number of cars in the central charging zone – which is to be considerably extended – has fallen by 30%, and accidents are down by 20%. Initial reports from Stockholm, where congestion charging was introduced on 1 January 2006, indicate a 25% drop in the volume of traffic, suggesting that the effect will be similar there. There has been a corresponding increase in the percentage of travellers using public transport, which the revenue from congestion charges will be used primarily to develop and modernise. Inner-city congestion charging has proved itself in the face of initial acceptance problems, and the spectre of desolate city centres that some people feared has not materialised. On the contrary, the quality of life has improved conspicuously in these inner cities, which are now more pleasant places to live in and visit – and the business community, incidentally, has benefited too.

28 In Eurostat's baseline scenario for the 25-member EU, it is assumed that the number of elderly people (aged 65-79) will rise by 44.1% between 2005 and 2050, while the number of very elderly people (aged 80 and over) will increase by no less than 180.5%. See COM(2005) 94: Green Paper entitled Confronting demographic change: a new solidarity between the generations, 16 March 2005, p. 5.

It is certainly true that the London and Stockholm models cannot be duplicated exactly in every European city. A major obstacle to their transferability lies in the technology, which is still very expensive, whereby vehicles are captured on video as they enter the city centre. This makes the system costs for the introduction of congestion charging very high. That is why it is more practical to create a European standard for congestion-charging systems, as set out in the 2007 EU Green Paper ‚Towards a new culture for urban mobility'.

(B 2) **On the way to a zero-emission car, pressure and support are needed for technological innovations in order to further improve conventional propulsion technology and to develop and apply new forms of propulsion technology based on renewables.**

Although the environmental efficiency of vehicle technology has been distinctly improved in recent years, there has been far too little progress in relation to what is actually needed to stabilise the volume of CO_2 emissions produced by the entire fleet of vehicles on Europe's roads and to reduce it in the medium term. At the same time, some European car manufacturers are highly successful global exporters. If we look at the newly industrialised countries, particularly China and India, in which motorisation is still in its infancy, it almost seems as though the age of mass car ownership has only just begun.

This development presents Europe and its highly advanced car industry with opportunities as well as risks. The thorny question about the future of the motor car in the context of a rapidly growing global vehicle market accompanied by dwindling oil reserves, however, has not yet been addressed with sufficient honesty by European car manufacturers. The scale of the challenge is still being played down.

In this age of globalisation, the sunrise markets will be captured by those who can offer innovative developments today to meet the challenges of tomorrow. We firmly believe that the European car industry possesses the engineering know-how and the capital to sustain its technological edge by means of green innovations. If the bulk of the cars and mobility systems of the future are developed and built in Europe, the prospects will be good for the future of the European car industry and for jobs in that industry. Conversely, if technological solutions are not found to drastically reduce dependence on mineral oil, there will be grounds for concern about Europe's export prospects and hence its future as a centre of car manufacturing.

The main legitimate concern about the European car industry is that it was caught napping by what is perhaps the most important innovation in propulsion technology in the last 40 years, namely the hybrid engine.

For environmental reasons and for the sake of Europe's role as a car-manufacturing location and the jobs the industry provides, it is therefore imperative to pursue systematically the efforts to increase the environmental efficiency of cars and to harness all our present and future potential for that purpose. The fields in which innovations are possible and the measures that can be taken can only be sketched out here. They are presented in detail in the *Green Car Concept* produced by the Green Group in the German Bundestag.[29]

In the short and medium term there is still great scope for the ***improvement of conventional propulsion technology***. For example, *downsizing*, that is to say more power from less cubic capacity, *common-rail engines* for diesel vehicles and *direct fuel injection* in petrol engines in conjunction with *twin-clutch gearboxes* prevent power interruption during gear changes and therefore enable drivers to achieve

29 Kuhn, F. et al. (2008): Green Car Concept. Die Zukunft fährt grün. Berlin (http://www.gruene-bundestag.de/cms/publikationen/dokbin/196/196255.reader_green_car_concept.pdf) (in German).

considerably greater fuel economy. *Variable displacement*, i.e. automatic deactivation of some cylinders when less engine power is needed, also saves fuel.

New synthetic fuels, which can also be obtained from biomass, will make it possible in future to combine the benefits of petrol and diesel engines in a combined combustion engine (homogeneous charge compression ignition (HCCI) technology). This nips pollutant emission in the bud during the combustion process and offers considerably greater fuel economy.

Huge efficiency gains are possible with ***hybrid vehicles***. These combine an electric motor with an internal-combustion engine. In the *full hybrid*,[30] the electric motor does the basic work, which means that the car can be driven in city traffic, for instance, with zero emissions. This also helps to reduce traffic noise, since electric motors are considerably quieter than combustion engines. For faster acceleration and at higher speeds the combustion engine is activated too, and it also recharges the batteries for the electric motor. Kinetic energy from the regenerative brakes is also recycled to the batteries. One further development is the ‚plug-in hybrid', where the battery can also be charged by plugging it into a socket, which means that distances of up to 30 kilometres can be covered using just electric power. Since nearly 80% of all car journeys each day are less than 20 kilometres, this might be enough for the majority of drivers. Another very promising departure is the ‚range extender'. These vehicles use only electricity, although their battery is recharged by a small combustion engine – or in future possibly also by a fuel cell. The advantage of this design is that the combustion engine can be very small and always runs at optimal efficiency like a generator. From 2011 this vehicle is also to be built and sold in Europe as the Opel Ampera.

Improvements in battery technology make purely ***battery-powered electric drives*** a serious option. All the notable international manufacturers have announced purely electric vehicles for the coming years, particularly in the small car segment. Some new manufacturers such as the Californian manufacturer Tesla Motors or the Norwegian firm Think are already offering purely electric vehicles as standard. The crucial factor for the ecological balance is how the electricity is generated. Vehicles are only truly clean if the electricity is produced from renewable energy sources. Given that electric motors have much greater efficiency – around 90% compared with 35-45% for combustion engines, electric propulsion has a definite advantage, as does electricity from CHP plants.

A ***visionary potential future innovation*** is the development of *solar car paints.* DaimlerChrysler and Volkswagen are conducting nanotechnology-based research into such paints, which would serve as semiconductors, with the result that the entire exposed bodywork surfaces of vehicles could be used to generate electricity, which could then be stored in batteries in hybrid vehicles, for example. Researchers believe that this could save half a litre of fuel per 100 kilometres.

Energy recovery from waste heat in engines (***thermoelectricity*)** is a BMW project designed to be ready for mass production in the next few years. A thermoelectric generator utilises the temperature gradient between the hot exhaust gases and the ambient temperature to generate electricity, said to give possible fuel savings of some 5%.

The fuel consumption of a vehicle depends to a great extent on its weight. A 100-kilogramme reduction in the weight of a car can save up to half a litre of fuel per 100 kilometres. The constant addition of new electronic components, particularly in connection with safety technology, as well as new features designed to enhance passenger comfort have steadily increased the weight of vehicles in spite of past reductions in

30 As an alternative to the full hybrid, increasing use will be made of mild-hybrid technology. This essentially involves a combination of a starter and dynamo in the form of an integrated starter-generator (ISG). An automatic start-stop mechanism ensures that the combustion engine is turned off as soon as the car comes to a halt and automatically starts again when the footbrake is released. A regenerative braking system also converts the kinetic energy used in braking into reusable electrical energy. Consumption reductions of up to 15% can be achieved with this technology, which is an especially interesting option for small cars.

bodywork weight. This is also a problem for hybrid vehicles with their 'double' set of technological equipment. The weight of passenger cars in Europe has risen by an average of 30% over the past 30 years. The addition of one weight factor tends to have a knock-on effect. The weight added by the incorporation of safety systems necessitates the installation of stronger, and hence heavier, engines, which leads in turn to an upgrading of the safety technology. Moreover, the trend among wealthy customers is for increasingly big and heavy cars. The conflict of aims between more and more safety technology, with its weight implications, and the general reduction of car weights can be resolved if new lightweight construction materials establish themselves in the market.

New weight-reducing construction methods will be introduced when electric drives replace internal-combustion engines as propulsion systems – in the form of decentralised wheel-hub motors, for example – and when mechanical components are replaced by electronic components (*drive-by-wire systems*). From prototypes of such vehicles – the AUTOnomy 2004 from General Motors and Toyota's Fine T 2006 – it is also apparent that a reduction of vehicle weight can lead to a further reduction in engine weight through downsizing, thereby reversing the present trend in car manufacture. This can be done without compromising on safety, because materials such as carbon-fibre-reinforced plastic (CFRP) and natural-fibre composites are considerably more rigid than steel but are also considerably lighter.

The public sector can play a pioneering role in the procurement of clean, green vehicles. To this end, the Commission presented a proposal (COM(2005) 634 final) for a directive on the promotion of clean road-transport vehicles, which contains an obligation for the public sector to ensure that the vehicles it procures are clean vehicles, i.e. vehicles complying with an 'enhanced environmentally friendly vehicle' (EEV) standard. It has been adopted by the European Parlament and the Council in Directive 2009/33.

There is also a need to step up research into efficiency enhancement for conventional engines and into new forms of propulsion technology and new fuels and to set up demonstration and pilot projects. A large amount of revenue from the European ecotax we have proposed should be made available every year for this purpose.

It must also be made clear, however, that technical means alone will not be enough to stop the present contribution of transport to climate change. For this reason, besides the need to make the aforementioned technical innovations as quickly as possible, there is also a need for a sea change in European transport policy.

(B 3) **There is a need to develop a European strategy for intermodal logistics and to develop combined road, rail and inland waterway transport by means of competition, standardisation and quality assurance.**

In 2007 the Commission presented a Freight Transport Logistics Action Plan. In conformity with the aims set out in the White Paper of 2001, the Commission sees its task as targeted coordination for the purpose of establishing better basic conditions for the development of intermodal logistics solutions, including the use of ‚green' transport corridors for freight.

On 4 September 2008, with a large majority, the European Parliament adopted the Cramer report on freight transport in Europe, which fleshes out the concept of ‚green' corridors. For example, the social costs of freight transport are to be transferred, the use of renewable energy sources increased, and at least 40% of EU transport appropriations are to be allocated to the railways. A European strategy for intermodal logistics with the aim of shifting as much traffic as possible from road to rail or waterway must certainly be one of the European Commission's core projects for the next few years. Today's environmental

and climatic challenges can only be met if the growth in freight transport is largely confined to the railways and the share of the freight market accruing to rail starts to grow again.

Important preconditions, such as the fair distribution of the environmental and health costs arising from road transport and investment in the development of Trans-European Networks, which should be reprioritised to make the TEN projects instruments of European unification, have been defined above.

In a parallel effort, the complex processes of intermodal logistics – which, unlike unimodal road transport, always involve at least one and usually two trans-shipment operations – must be sufficiently improved to make them an attractive proposition for shippers operating on most of Europe's axial routes, as otherwise hardly any freight transport will be shifted off the roads.

If the railways' share of freight business cannot be perceptibly increased, the coming years will see a discussion on whether there is any economic justification for investing billions in the development of rail transport. For this reason alone, a European strategy for intermodal logistics is one of the conditions for the sustainable success of a policy designed to shift freight operations from road to rail and waterway.

The fact that the policy of altering the modal split of freight traffic is not based on a pipe dream is illustrated by the case of Switzerland, where the population voted in a referendum for all transit traffic to be shifted from road to rail. The latest figures show that two thirds of transalpine traffic in Switzerland is now carried by rail, compared with only a quarter in Austria.

The three-pronged political strategy – an embargo on the construction of new motorways, the introduction of a mileage-based heavy-vehicle levy (LSVA), which in Switzerland costs four times as much as in Germany and twice as much as in Austria and applies to all HGVs on all roads in Switzerland, and the construction of new transalpine rail links with the 35-kilometre (22-mile) Lötschberg Tunnel, which opened in 2007, and the 57-kilometre (35-mile) Gotthard Base Tunnel, still under construction, as the key element – will lead to a further considerable shift from road to rail.

This will not only have implications in Switzerland but will also affect the access routes in France, Germany and Italy.

Besides the development of the rail and terminal infrastructure, the keys to the success of an intermodal logistics strategy are more competition within Europe's rail system, standardisation of loading units and a high level of quality assurance.

More *competition* will lead to an expansion of the market in rail freight transport by lowering costs and by making more customised services available. New rail-freight companies have also breathed fresh life into cross-border freight transport by offering one-stop logistics services through subsidiaries in other countries. The German company TX-Logistik, for example, which now has a majority shareholding in Trenitalia, can thus provide transalpine transit services with a punctuality rate of over 90%, according to its own figures, which puts it well above the industry average.[31] Such success can only be achieved, however, if the basic conditions are right. A comparable company in Austria, for example, had to close when the eco-points system was abolished.

Within the framework of the European intermodal logistics strategy, programmes such as Marco Polo II must be implemented and even extended where appropriate in order to shift more traffic to the railways.

31 See M. Cordes, 'Privatbahnen machen Dampf', in Verkehrsrundschau, 11/2006, pp. 23-24.

Other factors besides the proposals outlined above augur well for the transfer of freight traffic from road to rail. Two current trends seem likely to boost the prospects of an accelerated shift in the modal split:

Since the energy it takes to carry goods by lorry is considerably greater than the energy needed to carry the same goods by rail, and since that energy is almost entirely based on mineral oil and will remain so for the foreseeable future, rising fuel prices will have a disproportionately high impact on road haulage.

The wage factor in the haulage trade will tend to rise somewhat over the coming years. The social legislation on driving times and rest periods will be tightened, as will its enforcement through the digital tachograph. Provided the Member States are sufficiently diligent in monitoring compliance, road haulage will lose the illegal competitive edge it enjoys over the railways through the dangerous practice of allowing drivers to work overtime.

3 C Political measures relating to pricing

In accordance with the user-pays principle and the principles of cost-covering charging and fair competition, the social costs arising from the various modes of transport must gradually be transferred to their users. To this end, we propose a number of measures, the main one being the introduction of a European climate-protection tax on vehicle and aviation fuel.

(C 1) **A European climate-protection tax on aviation fuel should be introduced; revenue should be used primarily for transport projects designed to promote European unification, with the emphasis on international rail links.**

The price of air and road transport today does not reflect environmental reality because the **social costs** (the cost of accidents and invalidity, the cost of medical treatment and incapacitation, pension payments, rent reductions resulting from road- traffic noise, etc.) are not factored into the prices we pay but are borne by society at large. In Germany, for example, every car is indirectly subsidised by the taxpayer to the tune of €3 000 a year, according to a study conducted by the Environment and Forecasting Institute UPI in Heidelberg. This, in fact, is a conservative estimate, which does not include the costs arising from global factors such as climate-related disasters and the hole in the ozone layer.

Moreover, **selective tax subsidies**, particularly for air travel, distort competition between modes of transport, to the detriment of the more environment-friendly rail transport. Passenger and cargo flights today are not subject to excise duty on aviation fuel (kerosene tax), whereas fuel used in rail transport is dutiable, and cross-border flights are VAT-exempt into the bargain. Furthermore, in many EU Member States, the railway system is subject to user charges, such as track-access charges, which apply to all routes and trains, whereas for its competitor, road freight, such charges only apply to lorries weighing over 12 tonnes driving on motorways. It is hardly surprising that a shift is now taking place in road haulage from large to small HGVs and from motorways to major roads. And although the common rules on charges for heavy goods vehicles allow Member States to levy charges on all HGVs and all roads, they are not exercising this option. Switzerland shows how this can be done. In Switzerland, tolls are four times higher than in Germany and apply to all roads and all HGVs. This has demonstrably resulted in a shift from road to rail.

In order to correct this distortion of competition in the transport market and reflect the true cost of transport, we advocate the **introduction of a European climate-protection tax on aviation fuel (kerosene)** on all domestic and intra-EU flights (with the possibility of exemptions on routes served by non-EU carriers)**.** This revenue is necessary for the funding of measures to combat climate change and for transport

projects designed to promote European unification, with the emphasis on international East-West rail links. Priority should be given to modernising existing routes in preference to embarking on costly and time-consuming major projects. This will not only achieve greater efficiency more quickly; it will also create more jobs than machine-intensive construction projects.

Although the aviation industry may fight tooth and nail to defend its tax privileges, they are objectively unwarranted, historically outdated and environmentally counterproductive. Emissions from aircraft are two to four times more damaging to the climate than the direct impact of CO_2. This has to be factored into all measures, for example through levies based on emissions of nitrogen oxides (NO_x). Appropriate measures are needed, not only to create a level playing field in the transport market but also to give the airlines additional incentives to forge ahead with the development of cleaner and more efficient technology.

A tax on aviation fuel can already be levied in respect of domestic flights under the current European Directive restructuring the Community framework for the taxation of energy products and electricity (2003/96/EC). So far the Netherlands is the only Member State to have introduced such a tax, which is levied at the rate of about €0.20 per litre. Outside the EU, India, Japan and the United States[32] also apply kerosene taxes for domestic flights. If aviation fuel were subject to the prescribed minimum tax rate for mineral oil of €302 per 1 000 litres (i.e. about €0.30 per litre), such a tax would generate **revenue** of about €14 billion a year; if the tax were based on the Dutch rate, it would yield about €9 billion. Applied to the price of a ticket for a 625-mile flight within Europe, this would increase the fare by no more than €8 to €10, a contribution to the cost of minimising the environmental impact of air traffic which would seem affordable for both holidaymakers and business travellers and which must become as much a fact of life as the fuel supplements and charges for enhanced security that have been added to air fares in recent years and, incidentally, have not in any way slackened demand for air transport.

Not least in the aftermath of the hard-won compromise on the Financial Perspective for the EU budgets for the years 2007 to 2013, louder calls have been made for a European tax that would guarantee the European Union its own source of revenue. In the summer of 2004, the Commission presented a proposal for an EU tax,[33] which was initiated under the responsibility of the former Commissioner for Budgets, Michaele Schreyer (Germany, Greens).

In the report presented by the Commission in the summer of 2004, the first option proposed was an EU levy on road-transport fuel and an EU levy on aviation fuel. The argument advanced for the EU road-fuel levy at the time, which remains plausible today, was that there was already a Directive on the taxation of energy products which prescribed minimum rates and was intended to harmonise taxation throughout Europe. An additional argument in favour of a levy on aviation fuel is that European aviation policy is, to a great extent, an integrated transport policy and that the polluter-pays principle cannot be adequately applied in the form of national levies, since aviation emissions do not stop at national borders.

The introduction of a European climate-protection tax would not distort competition within the Union either, as it would affect all Member States to the same extent. Moreover, the environmental steering effect of an accelerated substitution of oil imports would bring about a lasting improvement in Europe's competitiveness in sunrise markets.

At the same time the minimum rate of excise duty on fuels, which presently stands at about €0.30 per litre, should be increased by 5% each year in the framework of a phased plan. Countries with low rates

32 The US kerosene tax for commercial domestic flights is USD 0.44 per US gallon, that is to say just over one cent a litre; see http://www.irs.gov/publications/p510/ch01.html#d0e2004

33 Commission of the European Communities, Financing the European Union – Commission report on the operation of the own-resources system (COM(2004) 505 final), 14 July 2004.

of excise duty, some of which – Luxembourg, for example – attract considerable volumes of petrol-pump tourism, would thereby be compelled to fall into line with European taxation standards.

Such a European climate-protection tax would have no net impact on competition. The bulk of the tax revenue would probably come from the countries of Western Europe, whereas the rest of the EU, and particularly the new Member States, would only contribute a small percentage on account of their limited volumes of traffic.

The expenditure priority should be the urgently needed increase in funding for the trans-European transport networks, which, as recently in March 2006, had their budget slashed to a third of the proposed allocation for the period from 2007 to 2013, which leaves only €7.2 billion available (see page 35). **At the same time, priority should be given to the modernisation of existing lines.**

Furthermore, this extra revenue in the Community budget should also be used to fund additional political action to provide support and promote research in the field of transport. The agreement of the peripheral Member States, which fear that the taxation of energy will be economically damaging to them because of the greater distances to their export markets, could be more easily secured if they – and particularly the Member States in Central and Eastern Europe – were to be connected to the European transport network and thereby brought closer to the heart of Europe more quickly.

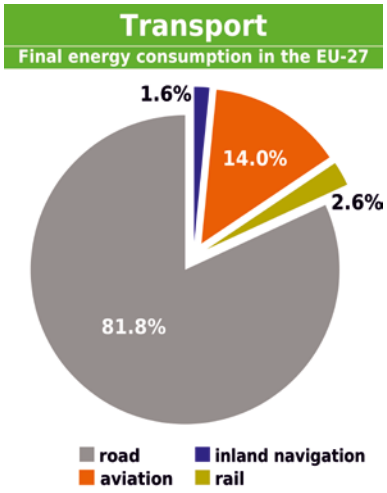


Fig. 11: Road and air transport account for 95.8% of the energy consumption of the transport sector.

Source: Eurostat

(C 2) **Road tax for passenger cars and light utility vehicles should be assessed in all Member States on the basis of fuel consumption and hence CO_2 emissions.**

A CO_2-based vehicle excise duty (road tax) in the Member States has also been mooted by the Commission in a proposal for a directive on the standardisation of road tax. As part of this shift in the basis of assessment, the initial registration taxes levied in some EU countries would be abolished and incorporated into the road tax.

We support the proposal in principle. If CO_2, emissions, and hence fuel consumption, become the assessment basis for road tax, a twofold benefit can be expected to accrue: more car buyers will opt for low-energy models, which will accelerate the overall reduction of fuel consumption as well as helping to protect the climate. Car-owners can also be expected to replace their old vehicles more quickly, which would speed up the modernisation of the vehicle fleet, thereby enhancing road safety and benefiting the car industry.

A CO_2-based road tax will, however, only have a steering effect if the rate of tax increases with each additional gram of CO_2. For all the great successes in the realm of air-quality management, the steering effect of differentiated taxation based on the European pollutant standards must not be downplayed, and the new road tax should maintain that differentiation. Considerably more road tax should be payable for old bangers that belch out fumes than for modern environment-friendly vehicles.

We also advocate the taxation of light utility vehicles throughout Europe on the basis of CO_2 levels. On the other hand, we do not believe that general compulsory abolition of the initial registration tax by virtue of EU

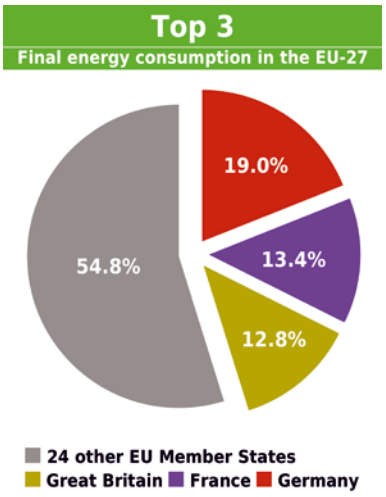


Fig. 12: Three EU Member States consume almost as much energy (45.2%) as the 24 other Member States: Germany (19.0%), France (13.4%) and Great Britain (12.8%).

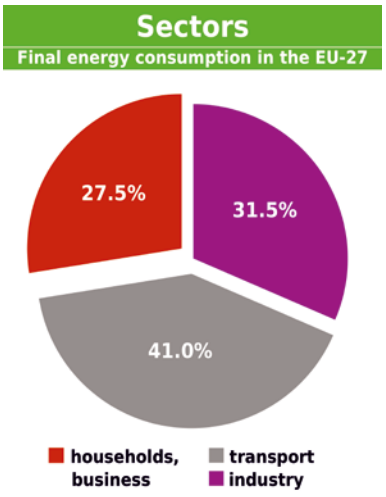


Fig. 13: The transport sector accounts with 41.0% for more than one third of the total final energy consumption in the EU.

See also the tables “final energy consumption” from page 41 on.

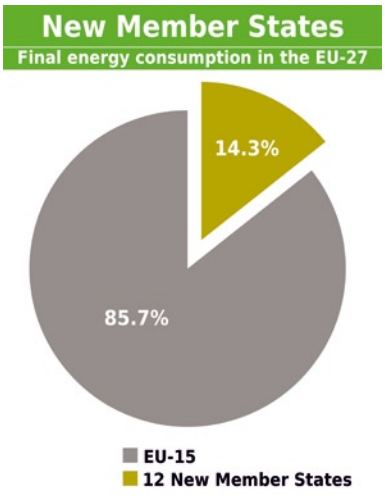


Fig. 14: The 12 New Member States account for about one eighth (14.3%) of final energy consumption and consume slightly more than France, but considerably less than Germany.

Source: Eurostat

law, which the Commission also proposes in its draft directive, serves any useful purpose, since this type of tax has beneficial effects in some countries. In Denmark, for example, it has evidently helped to keep car-ownership rates considerably lower than in neighbouring countries, despite a high general standard of living. Member States should therefore have the option of retaining initial registration taxes.

Contribution to the reduction of CO_2 emissions from transport operations: high

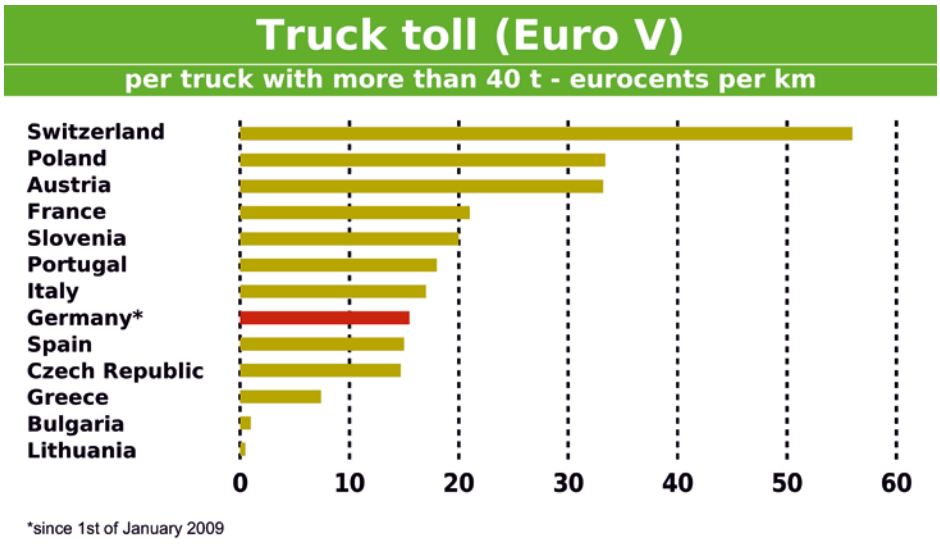
(C 3) **An increase in European HGV tolls based on the polluter-pays principle, with the social cost of road haulage factored into the charges, reduction of the liability threshold to 3.5 tonnes and gradual extension of the toll system to the entire road network.**

The EU Directive on the charging of heavy goods vehicles for the use of certain infrastructures (2006/38/EC, the Eurovignette Directive) creates the conditions for the levying of HGV tolls on Europe’s roads. It was last amended in 2006 and is currently being revised. The level of the HGV toll differs considerably from one European state to another. The toll for a 40-tonne, 4-axle Euro V HGV travelling 300 kilometres is €46.50 in Germany, €99.50 in Austria, €44.1 in the Czech Republic and €168 in Switzerland. This means that, even after the increase in Germany on 1 January 2009, the HGV toll in Switzerland is about four times as high (Figure 15).

On 8 July 2008, as part of its package for greening transport, the European Commission presented a strategy for the internalisation of external costs and a proposal for a new Eurovignette Directive which, for the first time, allows external costs of HGV traffic to be used to calculate the admissible amount of the toll.

Fig. 15: Switzerland goes the furthest, imposing a toll of 56 eurocents per km. Germany ranges 8th with 15,5 eurocents – more than three-times cheaper than Switzerland.

Source: McKinsey 2005



Belgium, Denmark, Luxembourg, the Netherlands and Sweden have a Eurovignette. Romania and Slovakia have own vignette systems.

Instead of agreeing on an overall 60% mark-up for external costs as the Committee on Transport and Tourism of the European Parliament had proposed in the 2005 debate on the last Eurovignette Directive, there is now a very complicated proposal which differentiates by both location and time of day and does not factor in climate costs and the cost of accidents. Furthermore, the charging of higher toll rates in sensitive regions such as the Alps has not been extended.

Added to this, the levying of tolls in the Member States is to remain voluntary. While track-access charges have to be paid on the railways, HGVs can travel toll-free in some EU states. The Eurovignette Directive also sets a maximum toll instead of specifying a minimum toll based on Euro class and the number of axles.

The European Parliament has now improved some aspects of this directive, for example by factoring congestion costs into the toll. One point on which Parliament has been successful is that in mountainous regions the external costs can also be taken into account, but costs such as climate change costs or the cost of accidents are still not included and have to be borne by taxpayers. Although the proposal is in effect a small step towards cost-covering charging in the transport sector, unfortunately it does not provide the necessary basis for a reduction in traffic and a shift to the railways.

As an alternative we therefore propose the following minimum rates, to apply with effect from 2012 and to be increased by 20% every two years:

Truck toll		
EURO class	**Minimum for at least 3 axles**	**Minimum for at least 4 axles**
up to EURO III	45 €ct per km	35 €ct per km
EURO IV	40 €ct per km	30 €ct per km
EURO V	35 €ct per km	25 €ct per km
EURO VI	30 €ct per km	20 €ct per km

Contribution to the reduction of CO_2 emissions from transport operations: high

(C 4) **Air transport and sea transport must be included in CO_2 emissions trading under Kyoto II. Tax privileges, subsidies and grants, including those for inland waterway transport, must be eliminated.**

In December 2006 the European Commission therefore presented a proposal for a directive **to include aviation activities in the scheme for CO_2 emissions trading within the Community** (COM/2006/0818 final), which was adopted by the European Parliament in July 2008 after long debates between the Commission, the Council and Parliament.

With effect from 1 January 2012 the scheme will accordingly cover all flights within the EU and flights between EU states and non-EU states. The scheme will cover only carbon dioxide but not the other effects of air transport that are damaging to the climate. In 2012 the number of allowances, known as a cap, will be 97% of the average emissions from aviation in the years 2004-2006, and from 2013 the figure will be 95%. If airlines' emissions exceed their allowances, they will have to buy additional allowances.

The introduction of CO_2 emissions trading marks an important step towards greater climate protection, although the planned revision of the directive in 2014 must fully include all greenhouse gases and the 2-3 times more damaging effect they have on the climate. The instrument should also be extended to international **sea transport**. In the May 2008 Piecyk report on an integrated maritime policy for the European Union, the European Parliament calls for the inclusion of sea transport in CO_2 emissions trading.

The *excise duty on aviation fuel (kerosene tax)* should be levied in the framework of the climate-protection tax we have proposed (see pages 29 *et seq.*). Another important step towards the elimination of subsidies is the introduction throughout Europe of VAT on cross-border air transport along with an obligation to levy VAT on domestic flights for those Member States which do not already do so.

We believe that a *tax on air tickets* to benefit the development initiative UNITAID is a good means of increasing public development aid to 0.7% of GDP, as promised in the phased plan adopted by the EU Member States in May 2005. Such a tax has already been introduced by France and seven other countries on four different continents, and a further 15 countries are currently preparing to do so[34]. This tax should be regarded as complementary to the inclusion of air transport in emissions trading, which is an essential instrument of climate-protection policy, and to the introduction of a tax on aviation fuel, a long-overdue measure in the field of competition policy.

Contribution to the reduction of CO_2 emissions from transport operations: high

State aid to seaports and airports should be entirely outlawed by means of an EU directive. At the present time, the northern-range ports of Antwerp, Rotterdam, Amsterdam, Bremerhaven and Hamburg are being massively subsidised because they are competing with each other. The result is that the port dues and charges in these ports come nowhere near covering their running costs. They are extremely low by international standards too, amounting to only about 30% of the charges levied by the Port of Singapore, for example.

Regional airports in particular benefit in many ways from subsidies, which are also contributing to the boom in low-cost air travel. These must also be prohibited by new state-aid legislation.

Contribution to the reduction of CO_2 emissions from transport operations: medium

34 UNITAID website: http://www.unitaid.eu/index.php/en/The-air-ticket-levy.html

Inland waterway transport in Europe has never been liable for excise duty on mineral oil. This tax concession should also be withdrawn, although this would entail the amendment of international agreements such as the Mannheim Convention for Rhine Navigation.

3 D Infrastructure measures

Investments in the creation of new infrastructure or upgrading of infrastructure can also be counterproductive in terms of their contribution to protecting the global climate. It is an established fact, for example, that new routes also generate new traffic, because they remove the barrier of geographical distance. The high-speed rail line between Paris and London, for example, not only attracts travellers away from the roads and the airlines but also makes it possible for people working in London to live in Paris and *vice versa*.

The crucial point is therefore the nature of the infrastructure measures that are taken. Because of the time factor, among other things, priority should be given to organisational and technical measures that speed up processes, increase capacity and, not least, enhance customer satisfaction rather than to the construction of costly new 'hard' infrastructure.

(D 1) **Trans-European Transport Network (TEN-T) projects must be reviewed as to their contribution to European unification and be supplemented by a new support project for the development of intermodal terminal infrastructure.**

The Trans-European Transport Networks are still based in some cases on the pursuit of the wrong priorities; above all, they are hopelessly underfunded.

We advocate a new prioritisation of TEN transport projects to put the main emphasis on projects that promote European unification, especially those that serve to provide rail links between the old and new Member States.

To fund these unifying projects we propose the introduction of a European ecotax (see page 29), the great bulk of which should be ringfenced for the construction of these transport networks.

New corridors should not be designated without a detailed strategic environmental assessment of every project as prescribed in the Directive on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment (SEA) Directive). An essential part of this process is the assessment of the climatic effects of each new project. New roads could then be approved only if evidence had been produced to show that there was no alternative, such as the upgrading of a rail link or of an existing road. The same principles should apply to part-funding from the EU Structural Funds and the Cohesion Fund.

Top priority on the list of projects should go to those schemes through which bottlenecks can be eliminated. The precept that upgrading existing infrastructure takes precedence over new construction works should apply. Expensive showcase projects that involve large-scale engineering works, such as new tunnels or bridges, must not only be assessed on the basis of construction costs but also on the basis of subsequent maintenance costs. Improvement work on roads and railways also has a far more beneficial effect on jobs, because the contracts are awarded in smaller lots and are generally labour-intensive. It is estimated, for example, that twenty jobs are safeguarded by every kilometre of roadway refurbishment, compared with only four jobs per kilometre for the construction of new roads.

The main purpose of railway infrastructure schemes should be to segregate faster and slower traffic and to make sufficient capacity available for freight traffic.

As a new priority project we propose the development throughout Europe of the terminal infrastructure for intermodal logistics solutions (combined transport). On the basis of the axes carrying the highest volumes of combined traffic, support should be given for road/rail trans-shipment facilities in the form of upgraded or new intermodal terminals as part of TEN-T projects; such support should cover up to 50% of the project costs.

One of the prerequisites for support should be the fact that a high percentage of the competitors in the field intend to use the terminal. On the one hand, this is a clear indication of the commercial viability of infrastructure and prevents misallocations of support funds. On the other hand, such a strategy prevents the sort of structural duplication that occurs when each of the national market leaders, the successor companies of the national railways, funds its own exclusive facility at great expense.

(D 2) **Paradigms for intelligence instead of concrete in transport: improving cross-border rail transport through Europe-wide technological and regulatory harmonisation under the flagship ERTMS/ETCS project is an absolutely paramount priority.**

For decades the railways formed the backbone of the European transport system. If the climate-protection targets for the transport sector are to be achieved, rail must win back parts of the market from road and air transport. Besides the creation of a level playing field, the main requirement is the establishment of a European rail system that is not restricted by waiting times at borders, which have long been a thing of the past in road haulage, and by differing track gauges and train-protection and signalling systems. It is therefore gratifying that a European Railway Agency was set up in Valenciennes in 2004 with the primary task of establishing interoperability between the various national rail networks.

The European Rail Traffic Management System and the European Train Control System (ERTMS/ETCS) form the central flagship project for the technical harmonisation (interoperability) of the European rail system. The essential function of ERTMS/ETCS is to ensure that the same system is used for rail operations throughout Europe and that a single system will one day replace the 20-odd national systems on Europe's main lines. The use of ERTMS/ETCS also serves to optimise the use of infrastructure capacity on busy routes, since the new technology enables trains to run safely at shorter intervals, thereby increasing line capacity by up to 20% without the need to lay a single metre of new track.

Freight transport by rail is five times more climate-friendly than road haulage. Another environmental advantage is electric traction on the railways, which provides scope for greater diversification of energy sources and thus helps to reduce Europe's dependence on oil in the transport sector. We, the Greens in the European Parliament, want to see the electricity for the European rail network being generated from renewable sources one day, which would reduce the net climatic impact of rail transport to zero.

There is enormous untapped potential for a modal shift in the domain of freight transport. Compared with travellers, freight shippers can choose their modes of transport on the basis of far more objective criteria. Whereas the decision to buy a private car severely limits a person's use of other forms of passenger transport, freight services that are superior to road haulage in terms of cost, time and, above all, reliability can induce shippers to switch to rail for their transport operations.

It is therefore a matter of urgency to implement the initiative of the European Parliament and support the establishment of ERTMS on the core European network with the aid of 50% part-funding from the EU

budget. At the same time, the introduction of ERTMS must become a precondition for the allocation of TEN funds to projects for the construction or upgrading of railway lines. The report compiled for the European Parliament by its rapporteur, Michael Cramer of the Greens/European Free Alliance Group, on the deployment of the European rail signalling system ERTMS/ETCS (the Cramer report), was adopted by a large parliamentary majority along with the three key amendments inserted by the Committee on Transport and Tourism:

Financial support from the EU for railway infrastructure projects will only be granted in future if ERTMS is installed.

The six freight corridors in Europe[35] on which the European railway companies agreed in their memorandum of understanding with the European Commission now have the backing of a large majority of the European Parliament too. The choice of corridors also takes account of East-West links with the new Member States.

Parliament takes the view ‘that for ERTMS at least in “cross-border” areas the maximum aid rate should be set at 50%’.

35 A: Rotterdam-Genoa, B: Naples-Berlin-Stockholm, C: Antwerp-Basel/Lyon, D: Seville-Lyon-Turin-Trieste-Ljubljana, E: Dresden-Prague-Brno-Vienna-Budapest, F: Duisburg-Berlin-Warsaw

4 Priority measures for a sustainable European mobility policy

There follows a list, which is by no means exhaustive, of the main measures we have proposed in this paper:

- Introduction of a compulsory ceiling for CO_2 emissions from road traffic. At the same time there should also be binding CO_2 ceilings for new vehicles in each class, based on the 'top-runner' principle.

- Introduction of a climate-protection tax on aviation fuel (kerosene) throughout Europe

- Assignment of priority to support measures and research activities in the following areas:
  (1) Intermodal logistics strategy
  (2) Urban mobility projects
  (3) Enhanced technical efficiency of vehicles

- Extension of HGV tolls to vehicles weighing 3.5 tonnes or more and, gradually, to the entire road network in conjunction with measures to minimise the level of nuisance to those who live or work close to main routes.

- Inclusion of sea and air transport in Kyoto II.

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CO_2 emissions in the EU-27

All sectors

EU-27 (in mio. t)	total	heat and energy production	industry	transport	households	services and other
1990	**4 566**	1 671	1 110	941	499	345
1991	**4 507**	1 647	1 036	944	530	351
1992	**4 360**	1 570	980	973	506	331
1993	**4 305**	1 510	961	988	523	323
1994	**4 280**	1 506	981	994	490	309
1995	**4 332**	1 503	1 009	1 014	493	314
1996	**4 444**	1 530	997	1 050	535	332
1997	**4 370**	1 479	1 000	1 074	504	313
1998	**4 371**	1 493	963	1 114	494	305
1999	**4 306**	1 453	937	1 132	482	301
2000	**4 341**	1 487	954	1 145	466	289
2001	**4 424**	1 520	938	1 161	498	306
2002	**4 402**	1 541	916	1 177	473	295
2003	**4 516**	1 591	939	1 193	488	305
2004	**4 554**	1 580	951	1 237	482	309
2005	**4 543**	1 569	943	1 247	482	302
2006	**4 559**	1 577	945	1 270	467	298

Source: Eurostat

Transport

EU-27 (in mio. t)	transport total	road	aviation	inland navigation	rail
1990	**941**	704	82	21	14
1991	**944**	712	81	21	12
1992	**973**	737	87	20	12
1993	**988**	746	90	21	11
1994	**994**	753	94	20	10
1995	**1 014**	767	100	19	10
1996	**1 050**	789	106	19	10
1997	**1 074**	799	110	19	10
1998	**1 114**	825	118	20	10
1999	**1 132**	841	127	20	9
2000	**1 145**	842	134	19	9
2001	**1 161**	857	137	19	9
2002	**1 177**	870	129	19	9
2003	**1 193**	879	133	20	9
2004	**1 237**	897	141	21	9
2005	**1 247**	895	150	22	8
2006	**1 270**	902	155	23	8

Source: European Environment Agency

Modal split

Freight transport

EU-27	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
road	67.5%	67.4%	67.4%	68.6%	69.9%	68.7%	70.6%	71.4%	71.6%	72.0%	72.4%	72.7%	72.7%
rail	20.2%	20.3%	20.4%	19.0%	18.2%	18.4%	17.4%	17.0%	17.2%	17.0%	16.6%	16.7%	17.1%
inland navigation	6.3%	6.1%	6.3%	6.3%	6.0%	6.1%	6.0%	5.9%	5.4%	5.6%	5.5%	5.3%	5.3%
pipelines	6.0%	6.2%	5.9%	6.1%	5.9%	5.8%	6.0%	5.7%	5.7%	5.4%	5.5%	5.2%	4.9%

Share in tonne-kilometres for domestic transportation.
Source: Statistical Pocketbook 2009, Directorate-General for Energy and Transport

Passenger transport

EU-27	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
car, motorbike	75.3%	75.4%	75.3%	75.3%	75.5%	75.2%	75.5%	76.0%	76.0%	75.7%	75.1%	75.2%	74.9%
bus, coach	9.5%	9.4%	9.2%	9.1%	8.9%	8.8%	8.7%	8.5%	8.5%	8.5%	8.4%	8.2%	8.3%
rail	6.6%	6.5%	6.3%	6.2%	6.2%	6.3%	6.2%	6.0%	5.9%	5.9%	6.0%	6.1%	6.1%
tramway, metro	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
aviation	6.3%	6.6%	7.0%	7.3%	7.4%	7.8%	7.6%	7.4%	7.6%	8.0%	8.4%	8.6%	8.8%
waterborne transport	0.8%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.6%	0.6%

* Buses and coaches
Share in person-kilometers for intra-EU transportation.
Source: Statistical Pocketbook 2009, Directorate-General for Energy and Transport

Final energy consumption

All sectors

2006 (mtoe)	EU-15	all sectors	industry	households, businesses	transport
EU-27		**1176**	324	481	370
EU-15		**1008**	272	405	331
Austria		**26.8**	8.7	10.3	7.7
Belgium		**38.2**	14.4	14.1	9.6
Bulgaria		**10.0**	3.8	3.4	2.8
Cyprus		**1.8**	0.3	0.6	0.9
Czech Republic		**26.3**	9.5	10.5	6.3
Denmark		**15.6**	2.9	7.4	5.3
Estonia		**2.8**	0.6	1.4	0.8
Finland		**26.9**	13.3	8.4	5.0
France		**157.8**	35.1	71.8	50.9
Germany		**223.1**	55.6	104.1	63.3
Greece		**21.5**	4.2	8.7	8.5
Hungary		**17.9**	3.4	9.8	4.7
Ireland		**13.0**	2.8	4.9	5.4
Italy		**130.7**	38.0	48.5	44.2
Latvia		**4.2**	0.7	2.3	1.2
Lithuania		**4.7**	1.1	2.2	1.5
Luxembourg		**4.4**	1.0	0.7	2.6
Malta		**0.5**	0.0	0.1	0.3
Netherlands		**50.8**	13.4	21.8	15.6
Poland		**60.2**	17.3	29.4	13.4
Portugal		**18.5**	5.7	5.7	7.1
Romania		**24.7**	9.5	10.9	4.4
Slovakia		**10.7**	4.5	4.3	1.8
Slovenia		**4.9**	1.7	1.7	1.6
Spain		**96.6**	30.1	25.7	40.8
Sweden		**33.2**	12.8	11.9	8.6
United Kingdom		**150.6**	33.6	60.9	56.1

Source: Eurostat

Transport

2006 (mtoe)	EU-15	transport	road	rail	aviation	inland navigation
EU-27		**370**	303	9	52	6
EU-15		**331**	267	8	50	6
Austria		**7.7**	6.6	0.3	0.7	0.0
Belgium		**9.6**	8.1	0.2	1.2	0.2
Bulgaria		**2.8**	2.5	0.1	0.2	
Cyprus		**0.9**	0.6	0.0	0.3	
Czech Republic		**6.3**	5.7	0.3	0.4	0.0
Denmark		**5.3**	4.2	0.1	0.9	0.1
Estonia		**0.8**	0.7	0.1	0.0	0.0
Finland		**5.0**	4.0	0.1	0.6	0.2
France		**50.9**	42.2	1.3	7.1	0.3
Germany		**63.3**	52.4	1.9	8.7	0.3
Greece		**8.5**	6.4	0.1	1.3	0.7
Hungary		**4.7**	4.3	0.1	0.3	0.0
Ireland		**5.4**	4.4	0.0	0.9	0.0
Italy		**44.2**	39.0	0.9	4.0	0.2
Latvia		**1.2**	1.0	0.1	0.1	
Lithuania		**1.5**	1.4	0.1	0.1	0.0
Luxembourg		**2.6**	2.2	0.0	0.4	
Malta		**0.3**	0.2		0.1	
Netherlands		**15.6**	11.5	0.2	3.7	0.3
Poland		**13.4**	12.6	0.4	0.4	0.0
Portugal		**7.1**	6.1	0.1	0.9	
Romania		**4.4**	4.0	0.2	0.1	0.0
Slovakia		**1.8**	1.7	0.0	0.0	
Slovenia		**1.6**	1.5	0.0	0.0	
Spain		**40.8**	32.5	1.1	5.6	1.7
Sweden		**8.6**	7.3	0.3	0.9	0.1
United Kingdom		**56.1**	40.0	1.4	13.0	1.7

Source: Eurostat

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