

The Second European Climate Change Programme

Working Group ECCP review –Transport

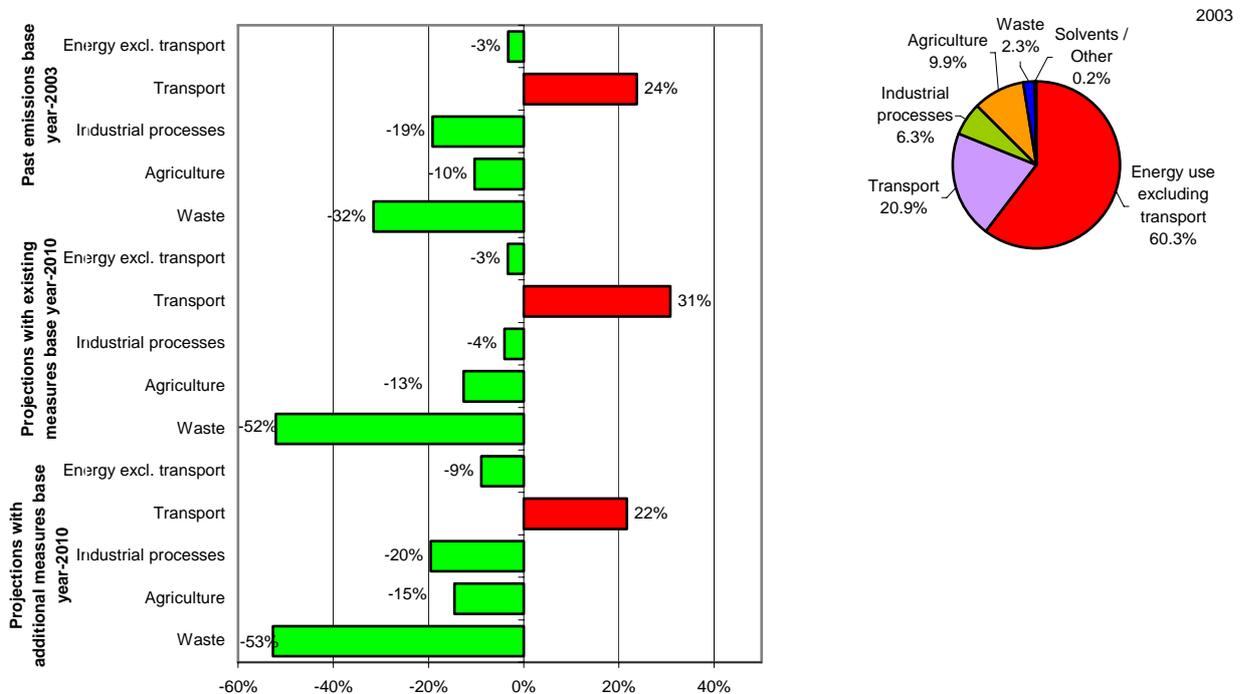
Final Report

A. Trends in transport and GHG emissions

Overall trends

Transport is the second largest sector of GHG emissions accounting for 19% of EU-25 emissions and 21% of EU-15 emissions in 2003. Between 1990 and 2003, EU-15 emissions from domestic transport increased by 24% due to continuous increases in road transport volumes (passenger and freight). Road transport is the biggest transport emission source (74% share). If domestic transport GHG emissions continue to increase with economic growth they would increase for the EU-15 by almost 31% by 2010 (compared to 1990) and up to 50% by 2020.

Figure 1: Change in EU-15 GHG emissions by sector base year to 2003, sector projections "with existing" and "with additional measures" base year to 2010 and share of sectors



Source: EEA 2005

For international traffic, maritime bunkers had increased by almost 40% (a yearly increase of about 3%) and aviation by almost 80%. Inclusion of these gives growth in EU transport GHGs of 28% since 1990. Overall transport emissions are shown in the table below:

Table 1: EU25 transport-related GHG emissions in 2003 in MtCO₂

Mode	National transport	International Bunkers	Total	Share
Road	892		892	74%
Rail	7		7	1%
Shipping	22	145	167	14%
Aviation	23	112	135	11%
Other	8		8	1%

Source: EEA 2005

Trends in MS

Significant variation was observed between Member States (MS), with growth in GHG emissions between 1990 and 2003 varying between the extremes of 130% growth to around 40% decrease. In 8 MS transport emissions have increased by more than 50% while there was a decrease in only 2 (new MS). The highest percentage increases in GHGs were mostly linked to increases in domestic aviation (28.9%) closely followed by road transport (25.1%). Only rail transport saw a substantial decrease (-40%) even if this is partly due to the effects of electrification that shift emissions to a different sector (additional reasons are increased energy efficiency and load factors). However, even when these effects are included rail emissions still constitute a small part of overall transport-related GHG emissions.

All EU-25 MS project growing transport emissions indicating that existing policies and measures (PAMs) have not been sufficient. Based on projections information from 18 MS from the EU-25, emissions will increase by 2010 compared to the base year by an average of 51% "with existing measures"¹ and by 32% "with additional measures"². For the EU-15 increases in transport-related emissions between base year and 2010 vary from 11% to 157% for the "with existing measures" analysis and between 5% and 83% for the "with additional measures" analysis.

¹ Existing policies and measures are those for which one or more of the following applies: (a) national legislation is in force; (b) one or more voluntary agreements have been established; (c) financial resources have been allocated; (d) human resources have been mobilised; (e) an official government decision has been made and there is a clear commitment to proceed with implementation.

² Additional (planned) policies and measures are options under discussion with a realistic chance of being adopted and implemented in future. For countries not providing scenarios with additional policies and measures the scenarios for existing measures are taken for the overall figures for projections (EU-15, EU-8 or EU-25).

Table 2: MS projections in the transport sector (base year to 2010)

	base year (mostly 1990) (Mt CO ₂ eq)	with measures (Mt CO ₂ eq)	with additional measures (Mt CO ₂ eq)	with measures % change (1990-2010)	with additional measures % change (1990-2010)
Austria	12,3	20,0	16,3	62,3	32,3
Belgium	20,2	28,6	25,1	41,4	24,1
Denmark	10,6	14,5	14,5	36,0	36,0
Finland	12,6	13,9	13,2	10,5	5,2
France	112,2	143,2	136,0	27,6	21,2
Germany	na	na	na	na	na
Greece	15,6	24,1	24,1	54,5	54,8
Ireland	5,1	13,2	13,2	157,1	157,1
Italy	104,4	146,9	130,8	40,7	25,3
Luxembourg	0,9	1,4	1,4	53,4	53,4
Netherlands	30,9	40,2	39,1	30,1	26,5
Portugal	10,9	23,4	19,9	115,5	82,8
Spain	60,0	105,0	89,0	75,0	48,3
Sweden	18,9	22,6	22,6	19,4	19,4
United Kingdom	125,4	143,4	143,4	14,3	14,3
EU-14 (excludes GE)	540,1	740,4	688,6	37,1	27,5
Czech Republic	na	na	na	na	na
Estonia	na	na	na	na	na
Hungary	na	na	na	na	na
Latvia	2,5	4,0	3,3	57,6	31,5
Lithuania	5,9	4,3	4,3	-27,2	-27,2
Poland	na	na	na	na	na
Slovenia	2,0	4,6	4,6	127,0	127,0
Slovakia	5,2	6,3	6,0	21,9	16,1
New MS 4 only	15,6	19,1	18,2	22,7	16,6

Source: EEA 2005

* no projections available for Malta & Cyprus

*na = not available

GHG trends

In 2002, CO₂ emissions from transport at 841.2Mt represented 24.9% of total CO₂ emissions, CH₄ emissions at 2.7Mt CO₂ eq. represented 0.8% and N₂O at 24.8 MtCO₂ eq. represented 7.6% (excluding LULUCF and international bunkers)³. The greatest increase was seen in N₂O (135%) resulting from increased penetration of catalytic converters. However, as the majority

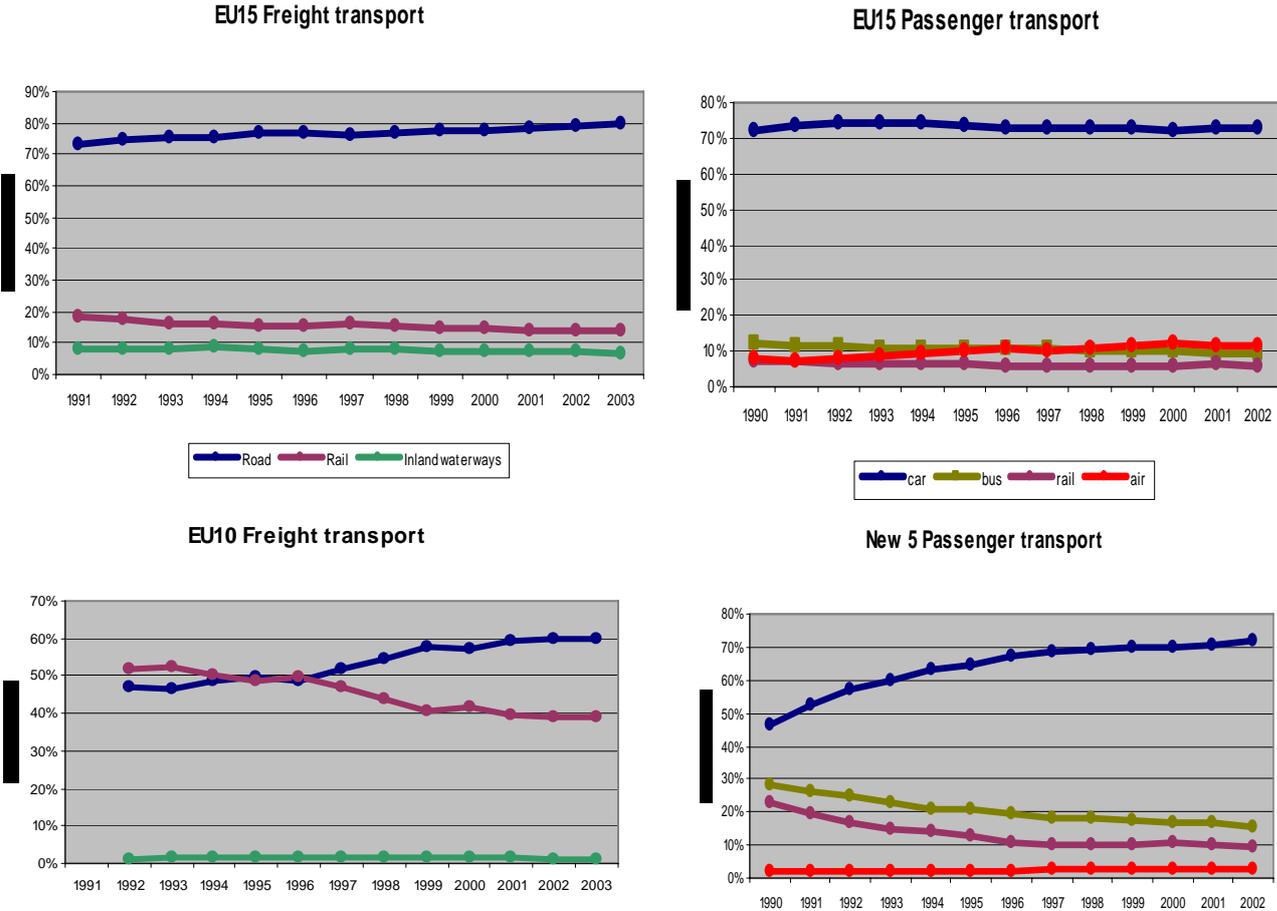
³ <http://cait.wri.org/cait-unfccc.php?page=sectors>

of the road vehicle fleet has now been equipped with the new catalysts these emissions are likely to stabilize or be reduced. CH₄ emissions decreased by almost 50% while CO₂ emissions increased by 22.6%.

Mode share trends

In the new MS, where the rail and road freight shares were comparable in 1990, there has subsequently been a continuous decrease in rail share. A similar phenomenon was observed for passenger traffic where the rail and bus shares, previously 55% have halved while cars and aviation have been gaining in importance. These trends parallel those that have taken place in the EU as a whole. For passengers it is clear that average travel distances are greater in more suburban areas. Urban areas could offer the potential for shifting to less GHG intensive modes provided appropriate infrastructures and facilities exist.

Figure 2: Modal shares: EU-15 and EU10 (1990-2003)



Source: DG Eurostat, 2005

Evidence was presented that for freight, transport is replacing some other aspects of the logistics chain. Examples were provided where the actual weight of goods consumed was decreasing but both tonne-km and vehicle-km had increased.

As the ECCP I did not refer to non-motorized transport, these modes of transport have not been taken into consideration by MS reporting. Non-motorized transport makes up between one third and half of trips in most European cities. Walking and cycling have been in decline over the last fifty years, although there are signs of an upturn in some MS.

Energy demand trends

Comparing the split of road transport, it could be seen that approximately one third of the energy use was in freight and two-thirds passenger. The latter was split approximately $\frac{3}{4}$ to petrol and $\frac{1}{4}$ diesel. Modelling shows that energy demand from passenger cars is stagnating while road freight transport tends to continue growing which will in turn result in significant increase in energy demand. Both passenger and freight transport have increased between 1990 and 2003 by 30% and 50% respectively.

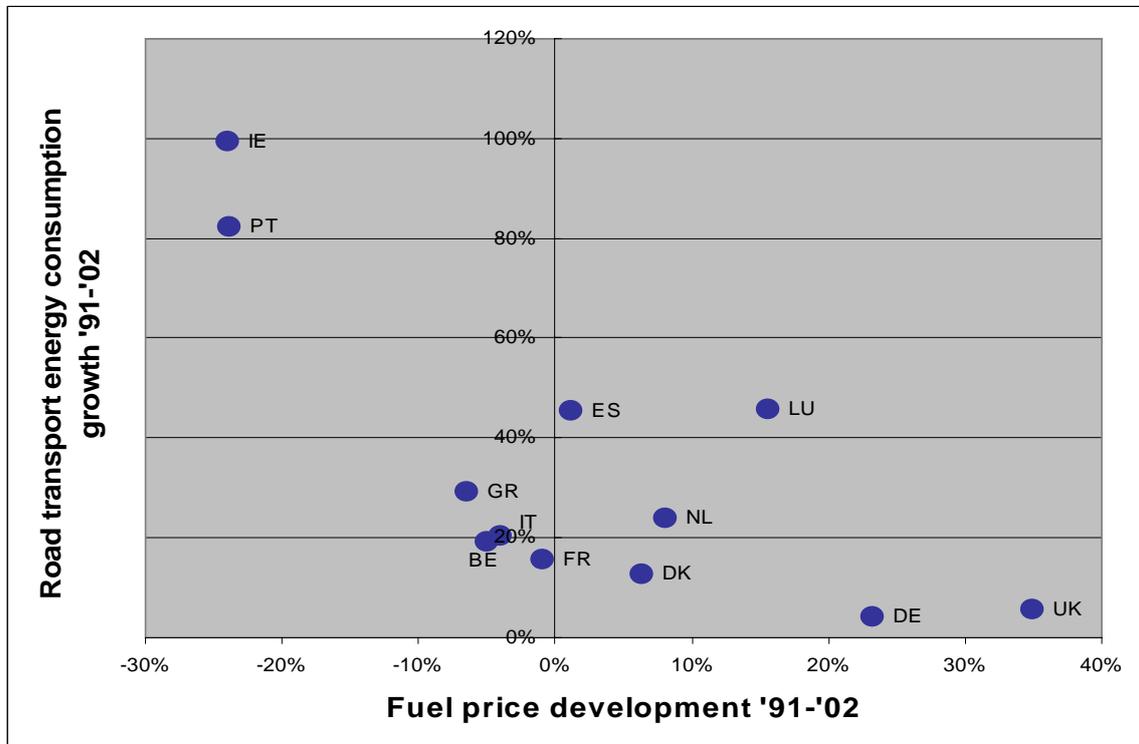
Occupancy rate trends

Occupancy rates for cars and lorries appeared to be steadily declining. While those for air freight had been fairly stable, with a slight increase. For other transport modes the information available did not enable any clear conclusions. Generally, occupancy rates would need to be studied even further in the future so as to improve the quality of information currently available. With regard to mode chosen, for freight there was a steady increase in road freight at the expense of rail. For passenger traffic, aviation had been growing while bus and rail had been decreasing. The overall share of cars in passenger traffic was fairly constant.

Transport and economic growth trends

A comparison of the economic growth rate and traffic growth rate showed that there had been a relative decoupling of passenger growth rates (transport volumes grow slower than the economy) while for freight, although there had been some years in which growth was lower than GDP, over the whole period there was no noticeable effect. A scatter plot of fuel price growth and CO₂ emission growth appeared to show an inverse relationship between these factors.

Figure 3: Growth in road transport energy consumption vs. growth in fuel prices (1991-2002)



Source: EEA, 2006

B. Policies and measures in Member States

Given the worrisome transport trends observed since 1990 (base year for the Kyoto protocol) and in order to help reach our Kyoto targets the European Commission established in 2001 the first ECCP addressing among other emissions from the transport sector. A wide range of different measures has been identified and introduced in MS in the context of this program, the majority of which have started to be implemented over the last couple of years. Most of these transport measures (as notified to the UNFCCC), fall mainly under the following categories:

- taxation (fuel taxes: 16.43 Mt CO₂eq. by 2010, vehicle taxes: 17.62 Mt CO₂eq. by 2010, fuel tax exemptions: 5.91 Mt CO₂eq. by 2010, registration taxes and tax deductibility rules),
- infrastructure charging,
- vehicle efficiency,
- logistics and combined transport, and

- public transport (promotion of the share of rail: 5.3 Mt CO₂eq. by 2010).

The sum of the quantified emissions reductions reported by the 19 MS that provided such information regarding the transport sector amount to 157 Mt CO₂eq. by 2010 representing 16.5% of GHG emissions for EU-25 from transport in 2003 (951.4 Mt CO₂eq.)

The overall estimated reductions in transport reported by Member States although they exceeded the estimated cost effective reduction potential in ECCP I, are not reflected in the actual and projected trends. Thus, further action needs to be taken to identify the reasons behind these discrepancies.

It was observed that monitoring and reporting of transport-related policies and measures is not very efficient among MS. There seems, in particular, to be a big gap between reported initiatives and the actual emissions. There are also great inconsistencies in the way that MS quantify reductions in GHGs from transport. It also seems likely that there are additional measures implemented that have not been reported as CO₂ saving measures. For example, although some MS have quite robust systems to monitor trends in walking and cycling, data on these modes were not included in their reporting. Similarly, the promotion of biofuels in transport is usually reported under the energy measures.

One point that seems to be clear is that there are a number of solid measures taken across different MS which are not necessarily part of all MS's transportation policies, indicating that significant work needs to be done in identifying and promoting best experiences and practices on a MS level. For example, there is a wide disparity between levels of non-motorised travel in otherwise similar MS, suggesting a potential to raise levels in MS with less sustainable travel systems. It has also been shown that many of the measures can actually save money for consumers when fuel savings are taken into account.

What was also interesting to observe on a MS level was that only 3 MS reported the use of road pricing and infrastructure charging while some do not even identify this measure as one that could help mitigate GHG emissions. The table addressing the status of implementation of various policies and measures of the ECCP I also indicates that many of the measures taken at an EU level have not yet been transposed by MS. Hence, their potential has not yet been fully realized (e.g., taxation of energy products and electricity).

Generally, it seems that MS have not necessarily realized the potential offered by various policies in the area of transport. National initiatives do not appear to balance out growth in emissions which may mean that other sectors will need to contribute more in order for the EU

to reach its Kyoto target. It also seems that regional differences and considerations in various MS pose an additional hurdle in identifying suitable transportation strategies to be widely implemented. Wide variations in geography, population density, cultural aspects and affluence affect the success of various policies and measures. Such differences need to be accounted for especially when attempting to promote behavioural changes and raise awareness. Overall, there is still great unexplored potential for improvement of transport trends all over Europe.

B.1 Selected Member State examples

The ECCP review included presentations by some MS that have relatively better results than others in reducing emissions from the transport sector. Some actions that MS found useful in reaching reductions in this sector were:

- the establishment of a package of measures: fiscal, technical administrative, awareness raising
- combination of urban with transport planning
- energy saving agreements with transport operators
- new service concepts (e.g., mobility management, environmental procurement of transport services, etc.)
- shift to less transport intensive industries
- technical optimisation
- reductions of competition distortions
- increase of diesel market share
- higher share of smaller vehicles in current passenger car fleet
- fuel and vehicle taxation

This list is of course by no means exhaustive and only provides additional examples to the variety of actions highlighted later on in this document.

C. EU-wide policies and measures and implementation in the MS

The second ECCP I report of April 2003 identified the following measures with a CO₂ saving potential of 152-185 Mt:

- Community strategy on CO₂ from passenger cars (including voluntary commitment – VC – of car manufacturers associations): 107 -115Mt (of which VC: 75-80)
- Environmentally enhanced vehicles: N/k
- Voluntary commitment on CO₂ light commercial vehicles (N1): 5-10 Mt
- Framework Directive infrastructure use and charging: 40-60Mt
- Shifting the balance of transport modes: N/k
- Fuel taxation: N/k
- Mobile air conditioning systems, HFCs: N/k
- Mobile air conditioning systems, CO₂: N/k

C.1 CO₂ and Cars (ECCP II WG)

The Community's strategy to reduce CO₂ emissions from passenger cars and improve fuel economy^{4,5} aims at achieving an average new car fleet CO₂ emission of 120g CO₂/km. It is based on three pillars:

- **Technological improvements in new cars (EU 15)⁶**: the voluntary commitments of the European (ACEA), Japanese (JAMA) and Korean (KAMA) Automobile Manufacturers Associations aim at reducing the average new car fleet CO₂ emissions sold in EU 15 down to 140g CO₂/km in 2008 (ACEA) and 2009 (JAMA and KAMA) – representing circa 25% reduction compared to 1995. Other obligations under the commitments relate to the placing on the market of cars that emit less than 120g CO₂/km, and to reviewing the potential for additional CO₂ reductions with a view to moving further towards the Community objective of 120g CO₂/km.
- **Consumer information⁷**: the EU car labelling scheme requires fuel consumption and CO₂ emissions information to be affixed to new cars when placed for sale on the EU market. The effectiveness of this scheme is being investigated in 2006 as part of the review of the CO₂ and cars strategy, so as to further improve customer information and encourage the purchase of low emitting vehicles.
- **Fiscal measures⁸** to promote car fuel efficiency: the Commission adopted in July 2005 a proposal for a Council Directive⁹ that would *inter alia* require Member States

⁴ COM (95)689 final

⁵ Council conclusions of 25.6.1996

⁶ http://europa.eu.int/comm/environment/co2/co2_agreements.htm

⁷ Directive 1999/94/EC relating to the availability of consumer information on fuel economy and CO₂ emissions in respect of the marketing of new passenger cars

http://europa.eu.int/comm/environment/co2/co2_directive.htm

⁸ http://europa.eu.int/comm/environment/co2/co2_expgrp.htm

⁹ COM(2005)261 final

that apply car taxation to include a CO₂ based element in the calculation of these taxes.

The Commission publishes yearly monitoring reports¹⁰ on the implementation of the CO₂ and cars strategy, and in particular on the achievements of the car industry under their voluntary agreements. Between 1995 and 2003, average EU 15 new car fleets were reduced by about 12%, from 186g CO₂/km in 1995 down to 164g CO₂/km in 2003. While the associations have met their interim target ranges set for 2003 (ACEA and JAMA) and 2004 (KAMA), major additional efforts will be required in order to meet the 140g CO₂/km target by 2008/9. Regarding the other two pillars (consumer information and taxation), their contribution to CO₂ reductions has been very limited.

C.2 Environmentally enhanced vehicles

The Commission has proposed a Directive¹¹ on the promotion of clean road transport vehicles which, however, only addresses conventional air pollutants and not GHG emissions.

C.3 CO₂ reductions from light commercial vehicles

While currently the EU strategy to reduce CO₂ emissions from road vehicles and in particular the car industry's voluntary commitments only apply to passenger cars (M1 vehicles), the Environment Council conclusions requested the Commission to study CO₂ emission reduction measures for light commercial vehicles (N1 vehicles). The first issue to address was the availability of data regarding N1 vehicles: with the adoption of Directive 2004/3/EC (amending Directive 80/1268/EEC on CO₂ and fuel consumption), CO₂ data will be available for N1 vehicles from 2010 onwards. The total number of N1 vehicles in the EU15 in 2002 was estimated to be 20.7 millions representing annual emissions of 88 Mt CO₂ (the same year new N1 vehicles were estimated at 1.5 million). As part of the ECCP working group on the integrated approach to reduce CO₂ emissions from light-duty vehicles, the Commission is investigating the potential for CO₂ savings from both passenger cars and light commercial vehicles. Regarding the latter, options include the definition of a CO₂ reduction target, the choice of an instrument to achieve it (e.g., voluntary agreement or regulatory approach, etc.), and also the possibility to include N1 vehicles into the car fuel efficiency labelling scheme⁷.

C.4 Infrastructure use and charging

¹⁰ http://europa.eu.int/comm/environment/co2/co2_monitoring.htm

¹¹ COM(2005)634

In its White Paper on the Common Transport Policy¹², the Commission stated that it would propose a framework directive on the principles and structure of an infrastructure charging system and a common methodology for setting charging levels and cross financing for all modes in 2002. This has not been done, however, the Commission has published a number of papers discussing the need to improve the structure of charges levied for the use of transport infrastructures. A primary element of these has been the need to include external costs within the charges levied at point of use.

The main legislative actions have been:

- Amendment of the Eurovignette directive (1999/62/EC).
- Adoption of a Directive on the interoperability of tolling systems (2004/52/EC).

In terms of the implementation of infrastructure charging, actual progress has been limited, and this has deprived the Community of a potential tool to influence transport demand. An overall conclusion has been that even though, charging frameworks are being set up, the variable elements of charges are still low compared to external costs. Additionally, infrastructure charging seems to be focused more on long-distance transport charging rather than on issues such as city congestion charging (e.g., London Congestion charge) which have a great potential to deliver results by affecting travel choice.

C.5 Shifting the balance of transport modes

Following COM(2001)580 the Commission has proposed a number of legislative actions and published a number of Communications addressing and improving the attractiveness of modes of transport which inter alia have lower GHG emissions. The main documents are:

- 2nd railway package: opening up freight markets (2004/51/EC), improving safety (2004/49/EC) and interoperability (2004/50/EC)
- 3rd railway package: opening up passenger markets (COM(2004)139, 142-144)
- Motorways of the Sea in Trans-European Networks (884/2004/EC)
- River Information System: shortening travel time (COM(2004)392)
- Marco Polo support programmes (1382/2003/EC, COM(2004)478)
- Intermodal standardisation (COM(2004)361)

There has been no evaluation of the GHG savings that have been realised from any of the actions carried out in this area, however, there is no indication yet that any shift of traffic away from road has been achieved. Even a small shift from road transport to rail, non-

¹² COM(2001)370

motorized transport or public transport could result to a significant reduction of the overall CO₂ emissions.

C.6 Fuel taxation

The Commission made a proposal for uniform diesel fuel taxation for commercial road transport (COM (2002)410). This proposal was rejected by the European Parliament. A new proposal reflecting the concerns of the Parliament, the enlarged EU and the new legal framework in place is expected to be tabled in 2006. Agreement was reached on the Directive on the taxation of energy products and electricity (2003/96/EC). The directive modernised and extended the Community energy tax framework. In the transport field, the Community minimum rates of taxation were raised, the obligatory tax exemption of aviation fuel was replaced by optional taxation, and flexibility for the use of fiscal incentives for environmental or transport policy purposes was introduced (public transport, renewables).

C.7 Mobile air conditioning: HFCs

One third from air conditioner-related emissions are due to CO₂ from operating air conditioning compressors and two thirds due to leakage of HFCs, in specific HFC134a. The MAC Directive sets out measures to minimise emissions of f-gases from air conditioning systems in cars (or car derived vans). This is to be achieved principally through:

- the introduction of maximum leakage rates;
- the eventual phase out in MAC use of f-gases with a global warming potential greater than 150.

C.8 Mobile air-conditioning: CO₂

While the impact of air conditioning systems on the fuel consumption of road vehicles is not taken into account in the EU type approval measurement procedure, it is estimated that it could lead on average to an increase in real life fuel consumption of 0.3l/100km (~7g CO₂/km). The Commission has launched investigations in order to develop a cost-effective measurement procedure of CO₂ emissions due to the use of mobile air conditioners, with a view to reflecting these in the type approval values and to promote the development of more energy efficient devices. These preliminary investigations have highlighted the difficulties of setting up such a procedure, in particular with regard to its repeatability and reproducibility. This question will be addressed as part of the work of the ECCP working group on the integrated approach to reduce CO₂ emissions from light-duty vehicles.

C.9 Other action undertaken at EU level

Alternative fuels

In its Communication on the implementation of ECCP I (COM (2001)580), the Commission stated that it would bring forward proposals on the promotion of biofuels and on excise duty reductions for biofuels. This was done and the resulting proposals have subsequently been adopted (2003/30/EC), (2003/96/EC).

The promotion of biofuels has focussed on volume of biofuels rather than CO₂ savings. Commission figures show that if the biofuel directive target is reached, CO₂ savings from biofuels would be around 26Mt CO₂ per year, around two thirds of the initially predicted CO₂ savings. Implementation of the Biofuel Directive by MS and the projections of production and consumption, raise doubts over whether the targets will be met without further efforts. The Commission will report on this in 2006.

Transport White Paper (COM (2001)370)

A mid-term review of the White Paper is being carried out in 2006. Many of the 2001 White Paper measures aim to reduce constraints on transport systems (opening of markets, TENs, elimination of bottlenecks). While overall ambitious objectives were put forward, such as “controlling the growth in air transport” and “revitalising the railways”, individual policy proposals are not assessed for their likely impact on GHG emissions, although an overall estimate under different scenarios is given. The review of the White Paper should take into account the need to integrate GHG and energy use objectives in the overall EU transport strategy. It should also be an opportunity to have an ambitious discussion over the policy objectives of transport policies in relation to climate change, in particular the need to identify which types of mobility should be encouraged or discouraged. Besides, while measures at the source (e.g., energy efficiency of vehicles) will provide some savings in terms of greenhouse gas emissions, measures having an influence on the demand for transport should also be considered, such as the envisaged, in the Transport White Paper, framework directive for fair and efficient pricing in all modes.

Energy efficiency Green Paper (COM (2005)265)

This discussion paper refers to a number of areas where action is envisaged that could impact on transport GHG emissions. These are:

- Organising air traffic management

- Optimising traffic management
- Developing a market for clean vehicles
- Charging of infrastructure to induce changes in behaviour
- Tyres
- Aviation – Communication on aviation and climate change

It is worth noting that the first two of these could either create win-win situations by improving mobility and reducing CO₂ emissions at the same time or lead to growth in demand, and thus GHG emissions, through reducing constraints. The Commission proposal addressing the third area (COM (2005)634) did not address vehicle GHG emissions.

Biomass action plan (COM (2005)628) and Biofuel Communication (COM(2006)34)

These documents identify the need to ensure that greenhouse gas savings from biofuels are actually realised, for example through better linking incentives to the level of savings and thus the types of biofuels under consideration.

Research and Demonstration activities

In addition, research, demonstration and sharing of best practice activities reducing transport CO₂ emissions have been carried out, for example CIVITAS, urban transport benchmarking initiative. Within the transport part of the Intelligent Energy Europe programme are a number of activities to improve awareness of measures to tackle increasing energy use in transport. Identified was the Eco-drive project on driver training. In other areas such as urban transport, there has been European support for local actions and sharing of best practice. Further benchmarking of policies and measures aiming at reducing transport-related GHG emissions could also be supported.

Other related strategies

The Commission has published a number of other documents that identify relevant issues for lowering transport GHG emissions, but from a different policy perspective. One example is the Urban Thematic Strategy, which will be followed with guidance on sustainable urban transport plans, while another is the Green Paper on Promoting healthy diets and physical activity: a European dimension for the prevention of overweight, obesity and chronic diseases" (COM(2005) 637) to encourage the use of non-motorised forms of transport.

C.10 Research

There is a wide range of research underway relating to GHG emissions from transport. Efficiency of vehicles has received a lot of attention. While significant savings appear feasible, questions remain as to how many of these technologies would actually enter the market, and to what extent their benefits will be offset through increased usage of private motorised transport. R&D has to focus on technologies, which are able to reduce CO₂ emissions in a cost-effective manner to be viable in the market.

In terms of surface transport the 6th framework program placed high priority on the development of clean technologies. Reduction of energy consumption and CO₂ emissions is pursued in all modes, but most effort is spent on road vehicles, where CO₂ emissions per unit of transport are usually high. More specifically, research projects aim at addressing: engine architecture and components, combustion efficiency, vehicle weight reduction, innovative types of vehicles and engines, including hybrid technologies. Current research in road transport addresses both light and heavy duty vehicles.

In terms of rail, special attention is given to improving the energy efficiency of the railway system and on energy recovery and storage. Specifically the sustainable energy supply project has an overall goal of reducing rail energy consumption by 6% by 2020. Other projects are aiming at efficient rail traction, development of alternative traction technologies and looking at optimisation through the complete power train system.

In maritime transport, great focus is placed on the development of a future generation of optimally efficient, clean and reliable marine powerplants, by the leading suppliers (80% of the market). Special attention is given to all aspects of the engine. In the maritime sector, research projects could lead to 3% reduction in CO₂ emissions by 2010, together with a 60% reduction in NO_x and 40% for other pollutants (HC, PM).

Relatively little EU-funded research has been carried out into travel behaviour change, measures to encourage shift from motorised to non-motorised modes of transport, and more strategic approaches such as planning to avoid the need to travel.

D. The Broader regulatory Framework

D.1 Impact of transport policies

Review of the Transport White Paper illustrates that there is no consistent integration of climate change goals into EU transport policy. A major goal of EU transport policy has been to remove constraints on transport within the EU. This has been achieved through infrastructure development, harmonisation of technical and operational requirements etc. However, there has been no countervailing move to ensure that these measures do not lead to a major growth in traffic and policies are often contradictory in climate change terms. It is also unclear whether at a MS, regional or local level there is any systematic attempt to ensure that transport policy decisions do not lead to growth in demand for transport.

ECCP I provided an assessment of greenhouse gas emission reduction measures in transport. The ECCP I Working Group on Transport identified measures with a saving potential of 152-185 Mt. All the “Transport White Paper” related measures were expected to provide a savings potential of 135 Mt/y. Most of these measures have been adopted and are partly implemented. However, transport demand and transport related CO₂ emissions continue to grow and there is no clear evidence as to whether the expected benefits will be realized and, if they are, by when this will happen.

D.2 Interaction between different policies and measures

There is a clear need to better understand the linkages between non-transport policies and transport demand. No systematic analysis is carried out at EU level. It is also unclear what actions are taken at a MS level. Demand management needs to be more effectively addressed and appears to have been under-utilized in the EU, notably with the lack until now of an ambitious legislative proposal setting the framework for fair and efficient pricing in all modes.

There is also a need for an integrated approach to reducing GHG emissions in the transport sector, where possible synergies with other policies (e.g., air quality, noise, congestion, quality of life in urban areas) are investigated and the associated costs identified. Such an approach could ensure the sustainable development of the transport sector.

As 80 % of European citizens live in urban areas and this is where 40 % of all transport related GHG emissions are produced¹³, there is, additionally, a clear need for better

¹³ DG TREN Roadmap – 2006/TREN/029

coordination between urban and transport policies. Urban areas offer a considerable potential for shifting to less GHG intensive mobility such as public transport and non-motorized modes as in many cities appropriate infrastructures and facilities exist. They also offer great potential for better urban planning, and better transport and traffic management within existing structures (e.g., parking management, access restriction to sensible areas). In this context the development of sustainable urban transport plans could be appropriate.

D.3 Mode specific issues

Passenger vehicles

Passenger vehicle efficiency can still be significantly improved in view of the Community objective of 120 gCO₂/km. Work is ongoing in the ECCP II working group on CO₂ reductions from light-duty vehicles, where measures on the vehicle side are investigated together with complementary measures such as alternative fuels, low resistance tyres and lubricants, better consumer information. Increases in efficiency should also be accompanied by improvement of infrastructure, the increased usage of CO₂ efficient fuels, higher occupancy rates and more fuel efficient driving behaviour and measures to address mobility demand.

HDVs

HDV share of road transport GHGs is increasing. There has not been concerted regulatory action on vehicle efficiency in the past because it was considered that since operations are commercial, there would be adequate pressure to achieve economically optimal efficiency improvements. There is evidence that this may not be the case, which would justify greater intervention to correct for market failure. Such action is already being pursued in Japan.

Public transport

Unfavourable framework conditions such as inappropriate urban planning and transport management, leading to a lack of attractiveness of public transport, have resulted in some cities to a decline of the share of public transport and a shift to private car use (and thus higher transport GHG emissions). Public transport fares have been rising relative to car use. This trend favours the private car over public transport. To increase the attractiveness of public transport comprehensive action is required regarding operator efficiency, mobility management, urban transport planning and mindful car usage.

Non-motorized

Walking and cycling constitute a large proportion of current journeys – for single-mode trips and as part of intermodal travel with rail or local public transport but are generally ignored in statistics and transport policy. There is a risk that these journeys will be increasingly transferred to motorised modes with negative consequences for GHG emissions as well as health, air quality, congestion and quality of life. Significant synergies with these other policy goals can be achieved through effective promotion of non-motorised transport.

Rail

Rail offers low GHG emissions per unit transport. The rail industry is working to share experiences and best practice on how to further reduce emissions. A large database of knowledge exists that has been assessed for effectiveness. One of the main obstacles for the further development of the rail sector is the lack of adequate and high-quality rail infrastructure.

Shipping

Shipping is currently responsible for about 2-3% of anthropogenic CO₂ emissions (main GHG emitted) and these are predicted to increase up to 50% till 2020. However, there is a very large gap (2 to 1 difference) between estimated emissions from bunker sales and estimated emissions from modelling of the fleet. The amount of CO₂ emitted is directly related to the consumption of bunker fuel oil. Shipping may be a bigger source of CO₂ emissions than aviation. Further work is needed to understand shipping emissions and to provide mechanisms to encourage improved performance.

Aviation

Although the EU's total greenhouse gas emissions fell by 5.5% from 1990 to 2003, emissions from international aviation increased by almost 80%. Even though there has been significant improvement in aircraft technology and operational efficiency this has not been enough to neutralise the effect of increased traffic, and the growth in emissions is likely to continue in the decades to come. COM(2005)459 recommends that aviation emissions should be included in the EU Emissions Trading Scheme as part of a comprehensive approach which includes research into cleaner air transport, better air traffic management and the removal of legal barriers to taxing aircraft fuel (see ECCP II WG on Aviation).

D.4. Long term scenarios and the link with short-term actions

Long-term planning needs to take in consideration societal changes, demand projections and potential technological advances. Currently there is no strategy that successfully addresses changing living standards, the evolution of the e-economy, and the increased demand for easy access to all services. E-services and the internet may lead to complex changes in transport demand. They may present threats from increasing small deliveries while offering opportunities for reducing passenger-related travel. Thus, significant efforts need to be placed in developing a number of action scenarios that address both various demand rates but also necessary emission reduction rates.

When looking at long-term planning it is also important to start addressing the concept of accessibility to goods and services rather than that of mobility, especially through better integration of transport with other policy areas such as land use planning, health and education. Improving accessibility could help the modal shift to less polluting modes of transport, and it could also help reduce transport distances and make more efficient the use of the existing transport infrastructure.

Transport infrastructure development has in the past been necessary to respond to increased transport demand due to economic growth and shifting mobility wishes. It is well documented that, in the absence of countervailing measures, infrastructure development could create additional traffic. It is also known that infrastructure tends to lock society into specific transport patterns for decades. However, certain infrastructure measures could also help minimize congestion and unnecessary travelling, as is the case for navigation systems. In all cases, the implications of such development need to be given more thorough consideration, if transport GHG emissions are to be more effectively controlled. Speed limits can also offer great potential for reducing GHG emissions, however on an EU level the subsidiarity principle does not allow for specific action in this area.

Land use planning establishes societal structures for long periods of time. These create transport patterns that are subsequently more difficult to change. The efficient use of land and of existing infrastructure could help to significantly reduce GHG impacts especially as people tend to increasingly move towards urban areas. Rail and non-motorized transport tend to have smaller requirements in terms of the area needed for them to operate than passenger or freight vehicles for example. Thus in the context of land use planning, it is important to determine whether adequate attention is given to longer-term issues, such as the need for transport GHG emission reductions.

Finally, an overarching concern, when examining both short and long-term policies, is whether and to what extent contradictions could arise between, the philosophy of the single market and the resulting growth in transport demand, with Community policies on GHG emissions and ultimately how these will be dealt with. Under this light, it is also important to explore whether the GHG values used to inform current policy decisions may significantly undervalue costs over the longer term.

D.5 RTD policies

There is a wide range of research underway relating to GHG emissions from transport. Especially, vehicle efficiency has received a lot of attention. While such technological development is important and significant gains are possible, a key challenge is how to get the measures into use. RTD policies need to be followed by a strategy addressing how they can better be introduced in the market and how their competitiveness can be enhanced. Incentives in promoting new technologies should be devised while the issue of timing needs to also be addressed. It also needs to be determined to what extent attained benefits could be offset through increased use due to lower costs.

The role of demonstration activities also needs to be explored, e.g., mobility management, measures to promote a shift to walking and cycling, and innovative urban transport policies.

E. Further conclusions and recommendations

The transport sector presents ample opportunity for improvements and for tackling the observed negative transportation-related trends in terms of GHG emissions. However, in order to take advantage of this still to an extent unexplored potential and achieve the necessary emission reductions, action in the transport area needs:

- to evaluate the degree to which savings can be achieved from different policies,
- to combine the most suitable tools,
- to act on the appropriate aspects of the transport chain in a co-ordinated way,
- to develop synergies to the maximum extent – demand, mobility, modal choice, vehicle efficiency, efficiency of vehicle use, carbon intensity of the energy used, but also synergies with other policies tackling air quality, congestion, etc.
- to be cost-effective (see below).

- **Lack of efficient assessment and monitoring.** Efforts to reduce GHG emissions from the transport sector play an important role for the EU's achievement of its overall Kyoto target. Nevertheless, there seems to be a lack of a consistent assessment of the impacts of transport policies and measures on GHG gases and a lack of an efficient monitoring system. These constraints make it difficult to effectively reduce GHG emissions in the transport sector which in turn means that other sectors may need to "pick up the slack" along with the associated costs in order for the EU to reach its Kyoto target.
- **Lack of coordinated strategy.** At EU level, a co-ordinated strategy to reduce transport GHG emissions is generally lacking. Different transport policies often have goals that are likely to be conflicting in this respect. Currently, the indirect effect of other policies on transport demand are often neither recognized nor quantified. It is very important that overlapping and rebound effects of transport-related policies or other policies that indirectly affect transportation patterns should be accounted for when designing any future strategy.
- **Need for cost-effective measures.** When addressing transport policies and their effect on climate change, there is a need to investigate and ultimately implement cost-effective measures in the overall context of the EU's efforts to reduce GHG emissions and across sectors. In evaluating cost effectiveness, it is also important that life-cycle related benefits and induced costs (compliance, external, competitiveness, energy security/dependency) from GHG reducing policies are fully identified and appropriately valued.
- **Lack of holistic approach towards each mode of transport.** A lack of specific European action was also identified in relation to one or more aspects of a number of modes of transport. In some cases, action has not been taken because of the view that market pressures will lead to fuel efficient choices being made. It may be that the belief in such a solution is exaggerated. Further investigation appears desirable and, where appropriate, action should be taken.
- **Better coordination on local, regional, national and community level.** A wide range of actions has been undertaken by Member States (and some also by the EU) to tackle CO₂ emissions from transport. However, further action is needed and also wider cooperation with local and regional governments, so as to better understand their concerns and assist them in devising future action plans, which given the right incentives could also ensure a more efficient and climate friendlier transportation planning. Efficient cooperation will

ensure that suitable action is taken at the appropriate level and that MS will get support in the areas where it is most needed.

Recommendations

Despite efforts to date, GHG emissions from transport have continued increasing and further action needs to be taken. In addition to the specific work carried out under the ECCP II working groups on aviation and on light-duty vehicles, the following measures have been identified:

- **Implement ECCP I measures.** The Community has so far failed to deliver on some of the measures identified under the ECCP I and mainly:
 - infrastructure charging framework for all transport modes
 - policy on environmentally enhanced vehicles that addresses GHG emissions
 - CO₂ emissions from light commercial vehicles
 - CO₂ emissions from mobile air-conditioning
- **Establishment of specific transport targets.** The role of transportation in reducing GHG emissions needs to be determined and targets need to be specified that take into account economic, environmental and societal considerations, in the overall context of national and EU efforts against climate change. In that light, complementary action plans both on a Community and a MS level will need to be developed. A compliance system will also need to be devised to help ensure the attainment of any potential future targets. Current trends and projections do not indicate that the targets originally set under the ECCP I are met.
- **Establish monitoring and review procedures.** Monitoring and review procedures need to be established looking at the progress made by MS in the field of sustainable transport based on the establishment of a widely acceptable basis of reference.
- **Address transport demand.** Various demand-oriented tools like fuel taxation, vehicle taxation, and infrastructure charging have to be carefully investigated. The final choices have to be made under consideration of maximising social welfare, incorporating environmental and social concerns and without constraining economic growth.
- **Account for external costs.** Internalizing external costs is part of the awareness raising-regarding transport choices. The users of transport infrastructures need to be made

responsible for all costs associated to their usage. It should be noted that the use of revenues and the geographical dimension (border/center countries) are key questions to address in order to reach the acceptability of any such charges.

- **Optimization of logistics.** Better optimisation of logistics could offer savings potential. While freight transport has been increasing, load factors have been decreasing. The need for faster service often compromises the overall efficiency of the system resulting to increased costs for both the consumers and the operators. Examples have been provided where costs and environmental impacts have been significantly reduced through a range of measures.
- **Include shipping in transport policies.** Shipping needs to be included in future taxation and infrastructure investments. Ship engine manufacturers and fuel suppliers must be provided with appropriate incentives to move towards environmentally preferable options.
- **Implement CO₂ indexing for shipping.** The IMO guidelines for CO₂ indexing for shipping should be encouraged so as to enable the evaluation of the performance of the existing European fleet.
- **Promote dissemination of research results.** Incentives may be required to bring technical innovations to the market, enhance their competitiveness and see them widely used. The role of demonstration activities also needs to be explored, e.g., mobility management, and innovative urban transport policies.
- **Encourage low-carbon vehicle market.** Stronger incentives need to be provided to encourage the market for low-carbon vehicles and provide the necessary momentum for car manufacturers to deliver the necessary emission reductions.
- **Improve comparability of transport modes.** A major issue identified when exploring various transportation modes was that of comparability of the services offered. Regulating prices or imposing taxes can only have a limited impact if the services offered by the various transport modes are not comparable. Quality, safety, timeliness considerations can play an important role both in terms of passenger travel and freight.
- **Improve connectivity between various transport modes.** There needs to be a joint transport-system established which successfully incorporates the various modes of transport (including non-motorized) based on their strengths and weaknesses and enables

the easy transition from one to another, so as to minimize unnecessary movement of goods and passengers.

- **Promote rail and public transport.** Increasing the occupancy of public transport modes including rail by improving their attractiveness and minimizing the associated costs could lead to significant reductions of GHG emissions. Modal shift policies should extensively address public transport and rail.
- **Account for non-motorized transport.** Non-motorized transport should be acknowledged by transport statistics and should be part of modal shift efforts. Principally in urban areas, these offer an attractive alternative to powered transport as well as having considerable synergistic benefits, for example in relation to obesity and disease prevention, noise, social inclusion and quality of life.
- **Education/awareness raising.** Awareness raising needs to be an integral part of a future transport strategy, especially regarding the environmental impacts associated with different transportation choices and daily travel behaviour. Behavioural changes can be important in reducing passenger vehicle-related emissions. An increase in public transport and non-motorised transport resulting from such behavioural changes could have significant benefits as well.
- **Improve driving behaviour.** Eco-driving schemes have illustrated on a relatively small scale for various transport modes the possibility of realising significant savings. They offer a good example of cost-efficient and straightforward action providing quick results, although their monitorability is problematic, and their actual effects over the long term are difficult to assess.