Technical specifications for call for tender EEA/ITS/02/005 **Annex II**

Framework agreement for editing, copyediting, proofreading and indexing work for the EEA

1. Objective

The purpose of the call for tender is to establish a maximum of three framework contracts. The successful companies will be offered a framework agreement of three years with two possible extensions of one year each to provide consultancy services in the following areas of expertise:

- editing
- copyediting and proofreading
- indexing

Companies must submit offers for all three areas of expertise.

EEA produces each year a substantial number of reports and other products on various aspects of Europe's environment. The products vary in scope, topic and with regard to primary target groups. Some products are reports aimed at a fairly "narrow" segment of environmental scientists and experts, other aim at civil servants and policy-makers at the European and national level while some are more popular in nature and intended for a wide audience. The Agency therefore tries to adapt the content, angle, format and presentation to suit the needs and conditions of the target group in question.

The Agency aims at ensuring a high quality in all aspects of its products. In that connection, the Agency needs to engage outside contractors possessing specialised competence in a number of areas, including those covered by this call for tender.

2. Tasks

Area of expertise 1: Editing

The contractor will be requested to carry out substantive editing of texts with a view to improving their overall presentation. This can range from making minor improvements to undertaking a full rewrite of the original text, and will require good insight into presentation of scientific material in general, and environmental subjects in particular. Editing will normally be done in consultation with the EEA project manager responsible for the report. The material will be delivered from the Agency as electronic files or, in exceptional cases, in hardcopy.

Area of expertise 2: copyediting and proofreading

An important element in the production process is the copyediting and proofreading of the finished manuscripts. A presentation that is substandard in these aspects will also inevitably lose in credibility with the reader. Furthermore, good language and correct orthography are a prerequisite for easy digestion of the texts, especially when these are in a language foreign to the reader. Also, copyediting is important for EEA texts that are frequently source texts for translations. Copyediting will be based on rules and norms spelled out in the EEA writing guide and the EU interinstitutional writing guide.

Area of expertise 3: indexing

The purpose of indexing is to make it easier to locate information on a specific subject within a document by using a controlled vocabulary and locators in the form of page numbers. Therefore the effectiveness of information retrieval depends on the quality and consistency of the indexing.

Tasks will include drawing up indexes for full EEA reports on the basis of a given brief and to check entries to make sure that they are accurate, logical and properly cross-referenced. The material will be delivered from the Agency as electronic files or, in exceptional cases, in hardcopy.

3. Language

Most of the Agency's reports are drafted in English. The contractor should therefore be able to work with texts, deliver drafts and communicate with Agency staff in this language.

4. Cascading award system

When drawing-up specific agreements for performing tasks under the framework contracts, EEA will first contact the company giving the most advantageous offer within that particular area of expertise. The company must be able to offer consultants with the required skills and experience to carry out the work in question within one week after being approached. If they are unable to do so, the company with the second best offer will be approached and so on.

5. Performance

Competence in both selection and award criteria must be maintained throughout the contract. EEA maintains the right to refuse any consultant if performance is not satisfactory.

Technical specifications for call for tender EEA/ITS/02/005 Annex IIa

(Reference award criteria for areas of expertise 10.1 and 10.2 of call for tender for editing, copyediting, proofreading and indexing work)

Draft chapter from EEA report Environmental Signals 2002

4. Transport

Policy issue	Indicator	Assessment
Decoupling transport growth from economic growth	Passenger and freight transport volumes and GDP	☹
Shifting the balance between modes of passenger transport	Modal split in passenger transport	☹
	Passenger cars	☹
Shifting the balance between modes of freight transport	Modal split in freight transport	☹
Reducing use of resources and emissions that damage the environment	Transport eco-efficiency	☹
Shift to improved technologies	Cleaner technologies and fuels	☺
Internalise external costs	Real changes in the price of passenger transport	☹
Stimulating fuel efficiency	Real changes in fuel prices	😐

Current trends are away from achieving the EU's recently-announced objectives of breaking the link between economic growth and growth in transport, and also of returning to the 1998 market shares for rail, maritime and inland waterway transport in 2010. Alongside greater use of cars and planes, passenger transport is growing at a rate close to gross domestic product development, while freight transport grows much faster than GDP.

Lower occupancy rates and the use of heavier and more powerful vehicles have offset the improvements in energy efficiency of cars. Growth in energy use and greenhouse gas emissions from transport is jeopardising the EU's ability to meet its targets under the Kyoto Protocol on combating climate change. Despite advances in technology and fuels, in many cities air quality still poses health risks and further improvement is needed.

Whilst there are signs that several Member States are now moving towards tax structures that differentiate between the various transport modes reflecting their environmental costs, significant barriers to implementation remain.

Progress towards a more sustainable transport system has become imperative in the European Union (EU). Transport therefore features prominently in the EU's Sixth Environment Action Programme (European Commission, 2001a) and Sustainable Development Strategy (European Commission, 2001b). At its June 2001 summit in Gothenburg, the European Council singled out

the transport sector as one of the four priority areas where sustainability policy development must be put on a faster track.

An important policy development is the publication, end last year, of the White Paper "European Transport Policy for 2010: Time to Decide" (European Commission, 2001c). This proposes an action plan of sixty or so measures around four main themes:

- shifting the balance between modes of transport (improving the quality of the road sector, revitalising rail, controlling air transport growth and adapting maritime and inland waterway transport systems, linking up of transport modes);
- eliminating bottlenecks (developing the trans-European transport network);
- placing the users at the heart of transport policy (improving road safety, fair and efficient pricing through infrastructure charging and harmonisation of fuel taxation); and
- managing the globalisation of transport (linking the future Member States to the trans-European transport network).

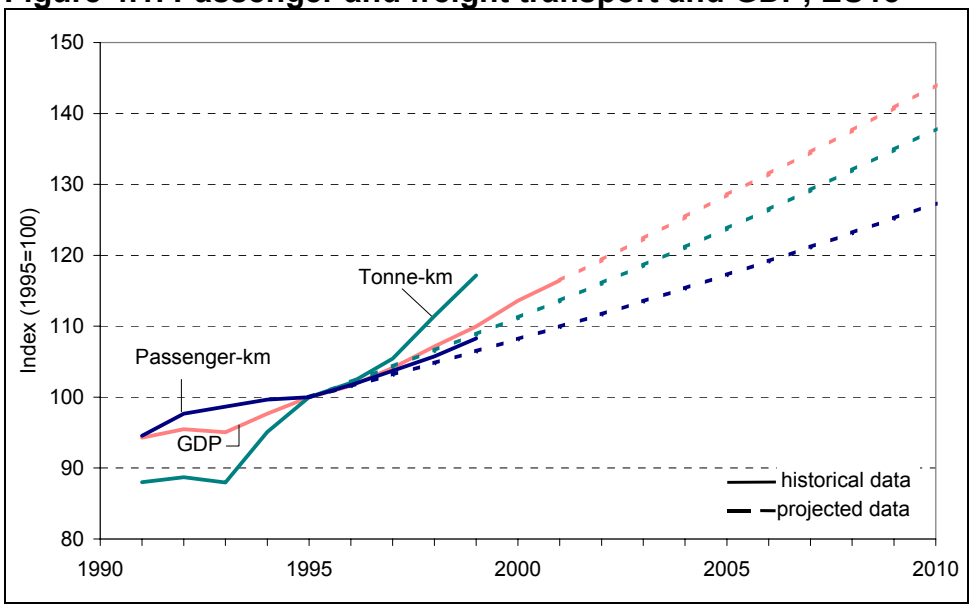
The proposed actions are focusing mainly on the objective of stabilising the modal shares at 1998 levels. The White Paper suggests that this would also result in decoupling of transport growth (in terms of vehicle-km) and GDP. However, no proper evaluation has been made of the effectiveness of the proposed measures, nor of their environmental gains.

Achieving progress requires better integration of environmental considerations into all areas of transport policy-making. To monitor progress made in this field the Transport and Environment Reporting Mechanism (TERM) has been established providing a regular indicator-based report through which the effectiveness of transport and environment integration strategies can be assessed (EEA, 2001).

[*Pressure of sectors on transport* - Summary box – to be added]

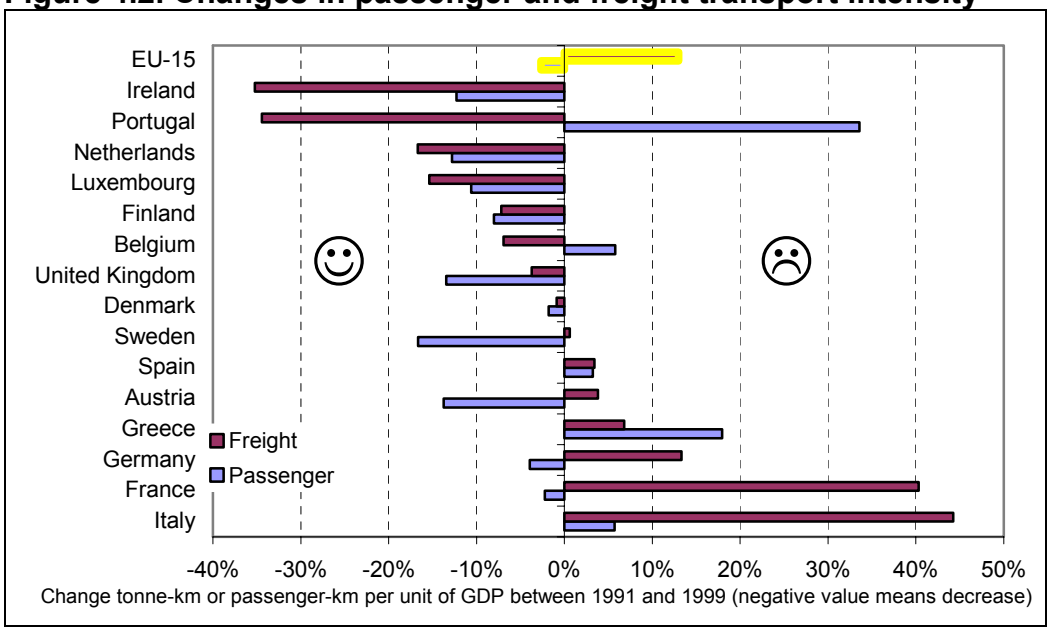
4.1. Passenger and freight transport volumes and GDP

Figure 4.1. Passenger and freight transport and GDP, EU15



Note: Passenger transport excludes motorcycle and inland waterway transport due to lack of historical data, and tram/metro since these modes are not included in the projection model PRIMES. For the same reason, short-sea shipping and air transport are not included in freight transport.
Source: Eurostat; European Commission.

Figure 4.2. Changes in passenger and freight transport intensity



Note: Passenger transport includes passenger car, bus/coach, rail, tram/metro, air (domestic) - Freight transport includes road, rail, inland water and oil pipelines
Source: Eurostat
[Designer: EU15 bars in order and outstanding]

Both passenger and freight transport (in passenger-km and tonne-km respectively) grew faster than projected between 1995 and 1999. EU enlargement is expected to result in significant added growth of passenger and freight transport in present decade.

Passenger transport grew at the same pace as GDP between 1991 and 1999. The total number of passenger-km travelled in the EU (excluding waterborne, motorcycles, walking and cycling) has

increased from 4 100 billion in 1991 to more than 4 600 billion in 1999. The data for aviation includes domestic and intra-EU aviation only. If extra-EU aviation, motorcycle and waterborne transport are included, growth in passenger transport (2.1 % per year) outstripped that of GDP growth.

The strong linkage between passenger transport demand and economic growth follows from people spending more or less the same share of their disposable income on transport (around 11 to 12%). Additional travel budget allows more often, further, faster and more luxurious travelling. Infrastructure development not only facilitates travelling, but also engenders additional traffic. As a consequence, people are able to live further away from every day destinations like schools, shopping and sporting facilities (urban sprawl) while at the same time these every day destinations are being located further away from city centres due to ill spatial planning (see Chapter 14).

Future passenger travel is expected to grow less than income, because of limitation of the average speed of travelling (due to safety concerns and congestion) and the assumption that people have a fixed time budget for travelling. Also, the strong growth in car ownership in current Member States is expected gradually to level out, because of saturation of roads and car ownership. However, this will not be the case in the candidate countries.

Freight transport (in tonne-km) in the EU increased by almost 30% between 1991 and 1999 at an average rate of 3.3% per year and is thus growing much faster than GDP (1.9% annually over the same period), due largely to globalisation of the economy and the liberalisation of the internal market. This leads to more complex production and trading networks, and thus greater distances. Also, loading factors decreased, amongst others as a result of 'just-in-time' deliveries: empty runs account for between 25 and 40% of total vehicle-km (based on data from Germany, The Netherlands and the UK).

The main assumption for the projected decoupling of freight transport demand and economic growth is a gradual shift away from industry towards a knowledge-based economy. However, the above-mentioned factors could counterbalance any benefits from this shift, as appears to been happening in most recent years. Again, enlargement of the EU is expected to increase transport flows, and in particular road haulage traffic.

Smiley box

☹ The objective to gradually break the link between economic growth and transport growth has not yet been achieved. Passenger transport demand has grown in the same pace as the economy, while freight transport even outstripped economic growth.

Quality information

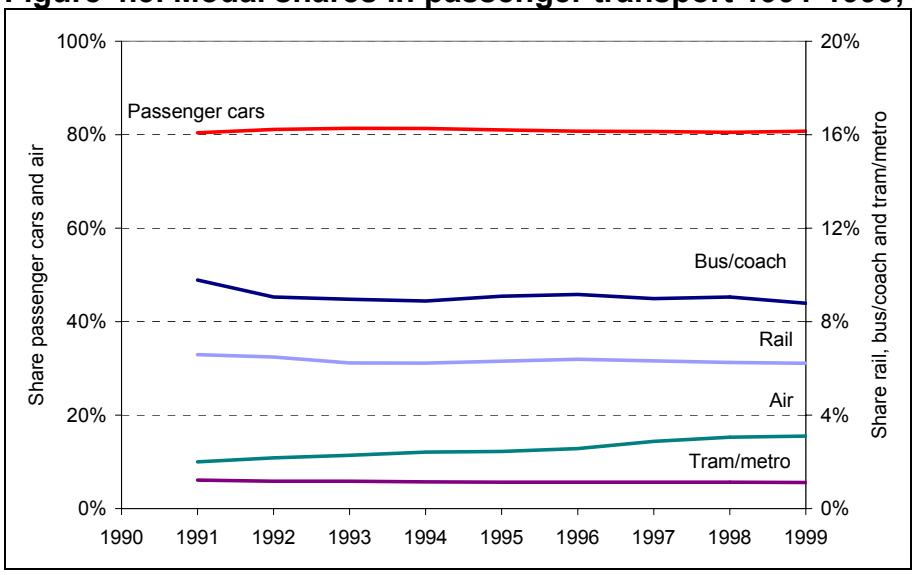
2: Data on passenger-km and tonne-km are calculated rather than directly measured and some modes are excluded due to a lack of historical data.
[Note that the above score has been generated for Signals 2002 as quality scores not available in factsheets]

Weblinks

[To be added]

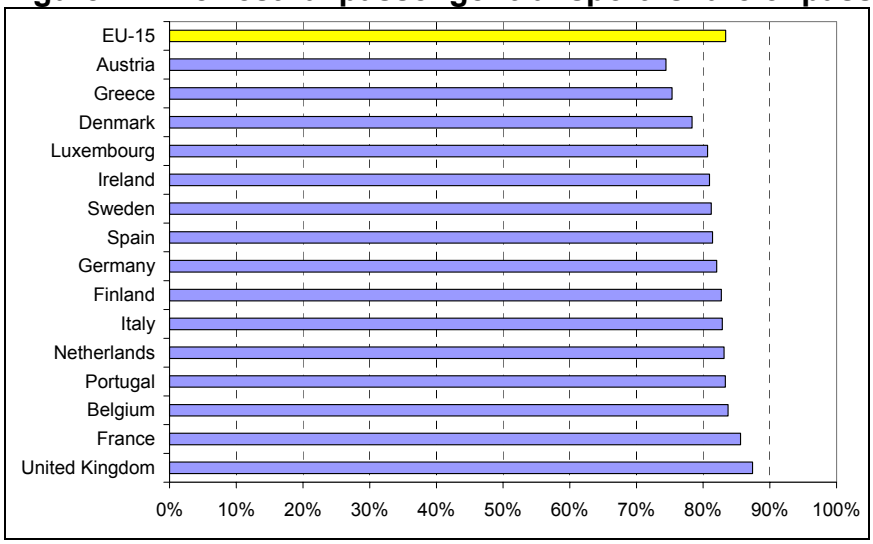
4.2. Modal split in passenger transport

Figure 4.3. Modal shares in passenger transport 1991-1999, EU15



Note: shares are calculated by using the modes shown in the graph. No sufficient data is available on motorcycle or waterborne transport. Aviation includes intra-EU and domestic only
Source: Eurostat
[Designer: split into two small graphs for each of the Y-axis]

Figure 4.4. Terrestrial passenger transport: share of passenger car transport, 1999



Note: modes included: car, bus/coach, rail and tram/metro (inland waterways and motorcycles left out due to missing data, aviation left out due to difficulties in allocating air transport volumes to countries). [1990-99 data? If yes, will replace graph]
Source: Eurostat
[Designer: EU15 bar in the order and outstanding]

By adopting the White Paper the Commission has proposed various measures with the aim of stabilising modal shares at 1998 levels by 2010, and shifting this split from then onwards. It is, however, unclear how far the proposed measures will contribute to achieving the modal stabilization, and what the extent of the environmental gains will be if stabilisation is reached.

The share of passenger car transport slightly increased from 80 to 81% between 1991 and 1999, while the share of domestic and intra-EU aviation rose from 2 to 3%. Growth in both modes resulted in a 2% decrease in the share of land public transport (rail, bus/coach and tram/metro) to

16% in 1999. In some Member States (Austria, Germany, Luxembourg, Spain, Sweden and the United Kingdom) the share of car transport in inland transport is, however, declining.

The main underlying factors for the observed developments in passenger modal split are:

- private transport is yet to a large extent faster and more flexible than public transport and is considered to be more luxurious than public transport (as the car is still seen as a symbol of wealth);
- inefficient pricing (i.e. prices that do not fully reflect all costs to society and the environment) has made both private and public transport relatively cheap. The mode choice for a trip based on economical considerations will favour private transport;
- investments have been mainly directed towards road, as a response to problems of traffic bottlenecks (Environmental signals 2001, section 5.5). Public transport received only a small part of all investments (high-speed rail being a notable exception). As a consequence, road (i.e. private) transport has gained in speed and flexibility over public transport. Some destinations can only be reached by private transport.

The increasing share of air passenger transport is a result of growth in both tourism and business travelling. Between 1990 and 1999 the number of international tourist arrivals in Europe, which can be used as a proxy indicator for tourism and business related passenger-km increased by almost 40% (WTO, 2000). The emerging high-speed rail services are already altering this trend on some intercity connections: the market share for flying between Madrid and Seville fell from 40 to 13% with the entry into service of the Spanish high-speed train (European Commission, 2001), and Air France eliminated flights between Paris Charles-de-Gaulle and Brussels. Airports more and more see high speed rail as a complementary mode to reduce short distance flights, and thus to free more slots for long distance flights, which are often more profitable.

[Possible Green Box: Innovative solutions to transport problems - Multi Modal approaches (e.g. specific examples of the role of "Multi-Modal Studies" in the UK and/or Finland/Sweden (elsewhere?) in coming up with innovative solutions)]

Smiley box

☹ Passenger transport continues be dominated by car (81% of the total), but air transport is now the fastest growing mode. The share of the more environmentally friendly modes (bus/coach, rail and tram/metro) continued declining, challenging the Common Transport Policy's target.

Quality information

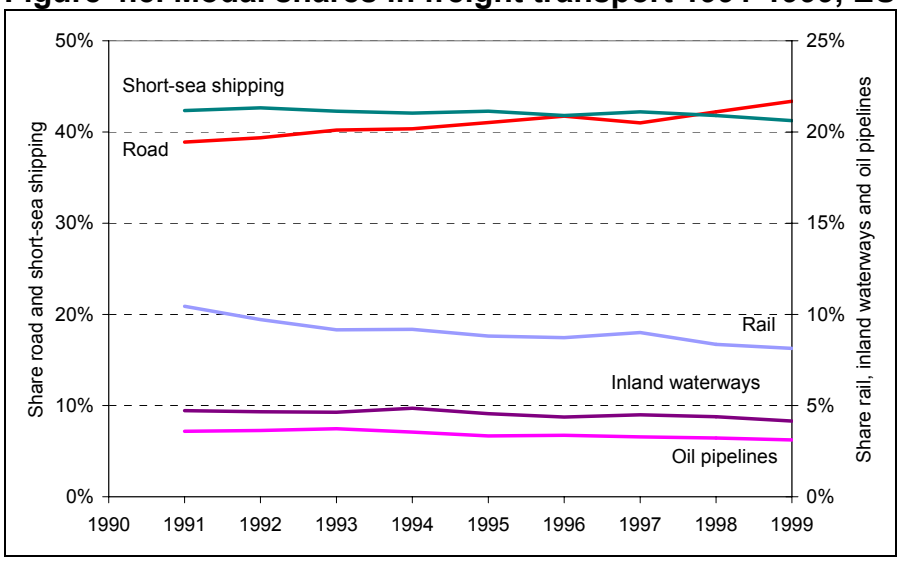
2: Motorcycle and waterborne modes are excluded due to a lack of data.
[Note that the above score has been generated for Signals 2002 as quality scores not available in the factsheet]

weblinks

[To be added]

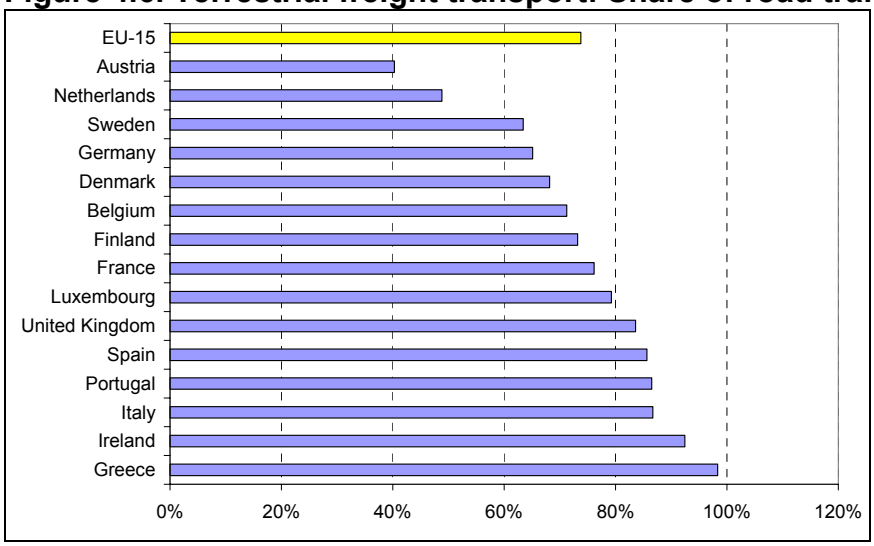
4.3. Modal split in freight transport

Figure 4.5. Modal shares in freight transport 1991-1999, EU15



Note: Shares are calculated by using the modes shown in the graph
Source: Eurostat
[Designer: split into two small graphs for each of the Y-axis]

Figure 4.6. Terrestrial freight transport: Share of road transport



Note: only road, rail, inland waterways and oil pipelines are included (short-sea shipping left out due to missing country breakdown and difficulty of allocating transported volumes to countries). [1990-99 data? If yes, will replace graph]
Source: Eurostat
[Designer: end figure at 100%]

The White Paper includes the target of returning the modal split in 2010 to the level of 1998 and shifting this split from 2010 onwards. Between 1991 and 1999 road freight transport share in total freight transport rose from 39 to 43% (80% of total tonnes transported in 1996, European Commission, 2001e). It is the fastest growing mode of transport (4.7% per year), followed by short-sea shipping (2.9%). The shares of rail, inland waterways and oil pipelines all decreased.

The preference for road can be explained by the following factors:

- Modern trade demands 'just-in-time' delivery of goods. Transport speed and flexibility are therefore of great importance. Despite congestion, road transport is often still faster and more flexible than rail or water transport;

- The road sector is liberalised to a great extent (with relatively low prices), while the rail sector is just starting to open up;
- The average tonne of goods carried by road travels 110 km (European Commission, 2001e), a distance over which rail and inland waterways are less efficient because road transport is still needed to and from points of loading. Moreover, efficient multi-modal transport is still often hampered by lack of close connections between sea, inland waterways and rail and standardisation of loading units.

For longer distances, short sea shipping has become quite successful in some parts of the EU. Also, the recently adopted railway package, aiming at full liberalisation of the rail freight market, together with the Commission's intention to create a dedicated rail freight network, should revitalise the rail freight sector and make it an attractive competitor to road. However, growing concerns are being expressed concerning the environmental performance of shipping (in particular related to its high emissions of acidifying substances) and rail (in particular related to noise).

Appropriate infrastructure pricing and internalisation of external costs (see section 4.8) is an important prerequisite for modal shifting, since commercial enterprises will search for the least expensive and fastest transport mode. Switzerland has sought to decouple economic growth from a growth in freight by introducing a differentiated kilometre charge, to replace current fixed charges and to internalise external and infrastructure costs on 1 January 2001. Several countries such as Germany and Austria are planning introduction of a similar charge by 2003.

[Possible Green Box: Switching freight to more environmentally friendly modes – some examples (Kraft Foods and IKEA) or European Commission's Marco Polo funding for freight intermodality]

Smiley box

☹ The share of road freight transport has grown at the expense of rail, contrary to the EU's objective to shift towards more environmentally friendly modes. Road freight and short sea shipping remain the main freight transport modes, accounting for 85% of the tonne kilometres travelled.

Quality information

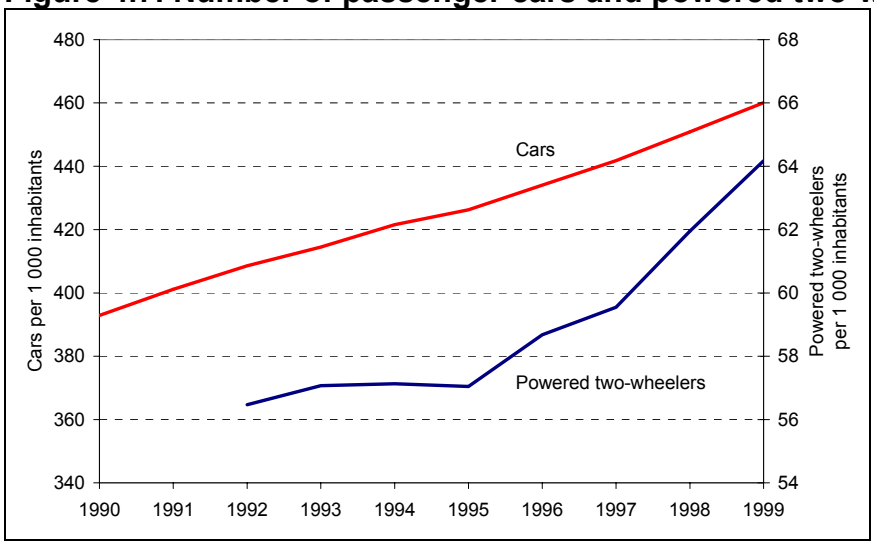
2: Some data are lacking for individual countries.
[Note that the above score has been generated for Signals 2002 as quality scores not available in the factsheet]

weblinks

[To be added]

4.4. Passenger cars per

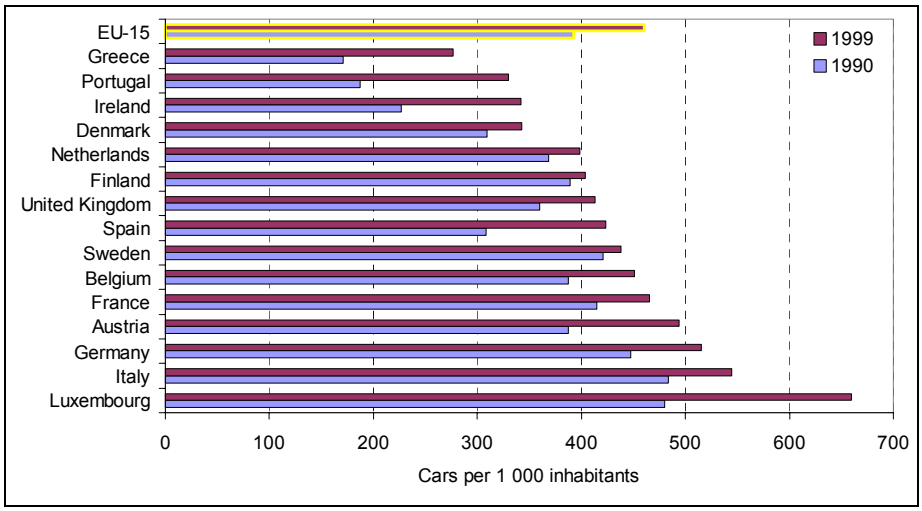
Figure 4.7. Number of passenger cars and powered two-wheelers, EU15



Source: European Commission

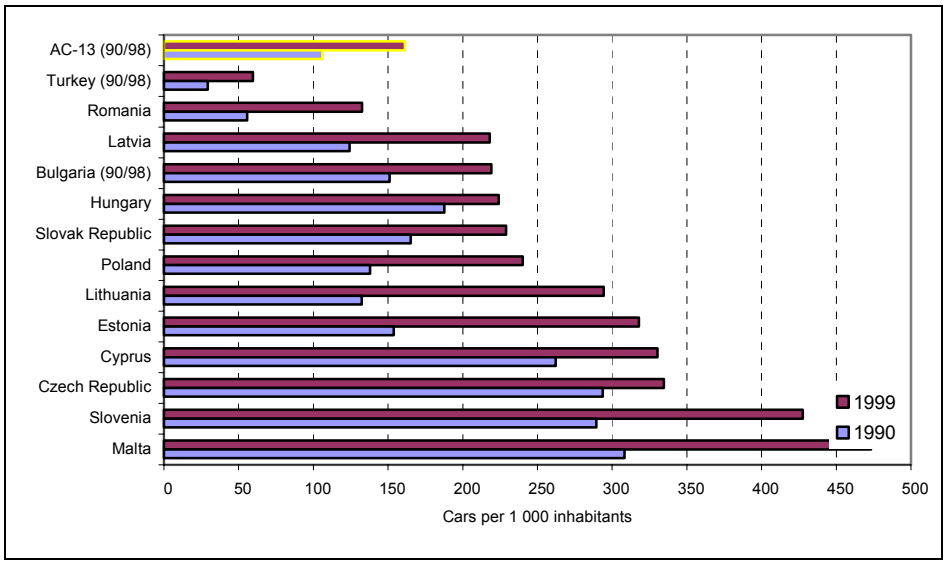
[Designer: two smaller diagrams; signature on Y-axis to mark non-zero axis]

Figure 4.8. Number of passenger cars by EU Member States and Accession countries



Source: European Commission

[Designer: EU15 bars in order and outstanding]



Source: UNECE

[Designer: Y-axis identical to EU15 graph]

The number of passenger cars in Europe has increased by almost 30 million between 1990 and 1999, corresponding with a per capita increase of 17% to 460 cars per 1 000 inhabitants. This represents an average annual growth rate of 1.8%, which is slightly higher than that of GDP per capita (1.6%).

The main factors underlying the strong link between the numbers of cars per capita and GDP per capita are:

- decreased accessibility by alternative modes to every day destinations (like shopping, work and leisure) due to urban sprawl and ill spatial planning;
- an increasing number of households (see Chapter 3), many of which need a car to reach every day destinations since public transport cannot provide the required accessibility. Moreover, an increased number of double-income families, requiring transport flexibility for both partners, stimulated car ownership even more;
- the car (and increasingly the powered two-wheeler as well) is still seen as a symbol of wealth and considered more convenient than using public transport.

In those countries with high levels of car ownership, the growth in car ownership is slowing as households may need one or two cars, but generally not more. In contrast, countries with lower numbers of cars per capita show rapid increases in vehicle ownership. For example, in 1990, the lowest levels of car ownership were found in Greece and Portugal with these countries having the highest increases in car ownership between 1990 and 1999. On the contrary, in Denmark and the Netherlands, countries with a relatively low car ownership, growth was small, whereas in Luxemburg, with the highest car ownership in the EU, growth was high. For the 13 EU pre-accession countries, the growth in car ownership between 1990 and 1999 was, on average, more than 52%.

The number of powered two-wheelers is increasing rapidly. The strong growth is of great concern, since emission limits for powered two-wheelers are much less strict. New emission standards will however come into force as from 2003.

Smiley box

☹ The level of car ownership is rising rapidly, especially in countries with relatively low car ownership levels, pushing the modal split in passenger transport towards road. The strong

increase in powered two-wheelers is worrying.

Quality information

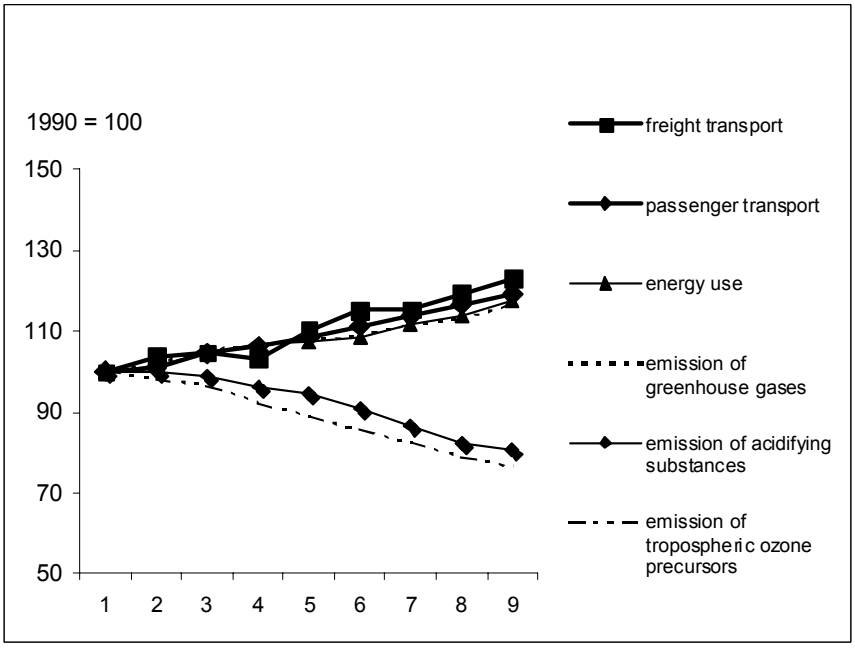
[To add a quality score and comment in relation to the EC 2001e source]

Weblinks

[To be added]

4.5. Transport eco-efficiency

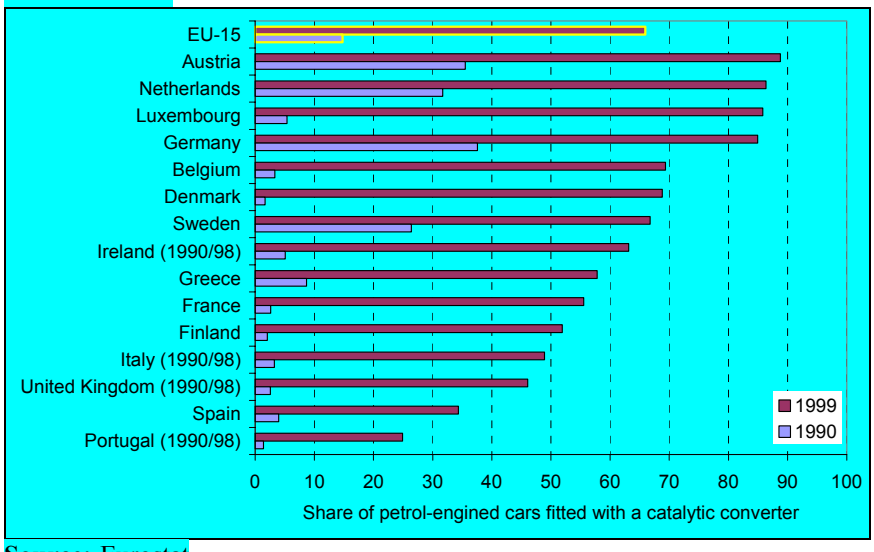
Figure 4.9. Some indicators of the eco-efficiency of transport, EU15



Note: Passenger transport includes travel by motorbike, car, bus, tram / metro, rail, water and air. Freight transport: includes freight by road, rails, inland waterways, short sea shipping, oil pipelines, and air.
Sources: EEA; Eurostat.
[Designer: Y-axis to start at 40 to ensure comparibility with Fig 3.1, 5.3 & 6.1]

[Note that the graph above and the following text is from Signals 2001 pending a shortened re-write if 1999-2000 data from Eurostat becomes available.

Figure 4.xx. Estimated share of petrol cars fitted with catalytic converter 1990 and



Source: Eurostat
[design note: label x axis with a % sign and add country names in full. Place EU15 bar in sequence]

Transport is the fastest-growing energy consumer in the EU: energy use since 1985 increased by 47%, compared with 4.4% for the remaining economic sectors. More than 30% of final energy in the EU is now used by transport. The energy efficiency of passenger transport (and thus its

specific carbon dioxide emissions) has improved only slightly, following technological improvements. There have been no improvements in the energy efficiency of freight transport. The discrepancy between improvements in technology and actual energy efficiency is partly the result of the use of heavier and more powerful vehicles and low occupancy rates and load factors.

In 1998, road transport contributed 20% of total carbon dioxide emissions. The voluntary agreement of the Commission with the car industry on the reduction of carbon dioxide emissions of new cars has led to a reduction of almost 6% in emissions from new cars between 1995 and 1999. However, all three cooperating car manufacturing associations (Europe, Japan, Korea) will have to increase their efforts if the final target of the agreement for 2010 is to be met.

Road transport is also a small but growing source of nitrous oxide emissions, a side-effect of the fitting of catalysts to passenger cars. Nitrous oxide emissions from transport almost doubled between 1990 and 1998 to 7% of total emissions. A substantial further rise is expected by 2010. However, since transport is not a large source of nitrous oxide, this will not have a major impact on the overall trend of greenhouse gas emissions.

Emissions from international shipping are currently not included in national inventories, but it is estimated that shipping in European waters contributed 24% of total sulphur dioxide emissions and 22% of total nitrogen oxide emissions from EU15 countries in 1998.

Between 1990 and 1998, EU greenhouse gas emissions from international transport (based on fuel sold in the EU to ships and aircraft engaged in international transport) increased by 33% to reach 5% of total EU emissions. These emissions are not addressed under the Kyoto Protocol, but the International Civil Aviation Organisation and the International Maritime Organisation are currently examining reduction options.

Transport is responsible for more than half of emissions of tropospheric ozone precursors and more than 20% of emissions of acidifying substances. There were significant reductions in emissions of tropospheric ozone precursors (by 25%) and acidifying substances (by 20%) from the sector between 1990 and 1998, due primarily to the introduction of catalysts in new petrol-engine cars and stricter regulations on emissions from diesel vehicles. Without these measures, nitrogen oxides emissions from traffic in the EU would have been 50 % higher in 1998.

The rate of penetration of new technologies is highly correlated with the average lifetime of vehicles and the average age of the fleet. Estimates based on the numbers of cars fitted with catalytic converter suggest that it takes at least ten years for a new technology to penetrate the entire car fleet. The proportion of trucks and aircraft that comply with new higher emission standards is even lower than for cars, mainly because of the relatively high lifetimes of these vehicles. For example, in 1998 10% of the commercial aircraft fleet were more than 20 years old.

In 1999, 63% of petrol-driven cars had catalytic converters, with wide variations between Member States. Although many Member States had already encouraged the use of catalysts in cars before 1990, Directive 91/441/EEC (introducing the Euro I standard) made it happen in all Member States. The gradual increase in sales of diesel passenger cars in some European countries contributed further to a reduction in nitrogen oxide emissions, particularly in Austria, Belgium, Germany, France and the Netherlands. The introduction of stricter emissions standards in 1996 and 1997 (Euro II for passenger cars, light- and heavy-duty vehicles) has also contributed to the reduction in nitrogen oxide emissions.

The introduction of unleaded petrol is a major success story in the EU (total inland deliveries rose from 0% in 1985 to over 80% in 1999). It is expected that leaded petrol will be completely phased

out by 2005. The objective of switching to less environmentally harmful fuels has thus been achieved. Many member states now also encourage the use of low sulphur petrol and diesel.

Despite efforts at the EU level to promote alternative (electricity, natural gas, fuel cells) and renewable energy sources (biofuels) for transport, these still have a low penetration. However, the share of LPG and natural gas in total energy consumption by road transport has been rising from 1992 to 1998 and dropping in 1999. Although alternative fuels still account for only a small fraction of total fuels sold, their usage is increasing.

Smiley box

☹ As a consequence of the drastic growth in transport, and the shift to road and aviation, carbon dioxide emissions from the transport sector are continuing to grow.

☺ Cleaner technologies, notably the introduction of three-way catalysts resulted in an absolute decoupling of the emissions of acidifying substances and ozone precursor substances from transport development. There is however approximately a ten year time lag for technological improvements to have an effect on reducing environmental pressures.

Quality information

2: A vehicle de-registration procedure would be needed to identify more precisely the actual share of the fleet complying with certain emissions standards.

Smiley box

Quality information

[To be added]

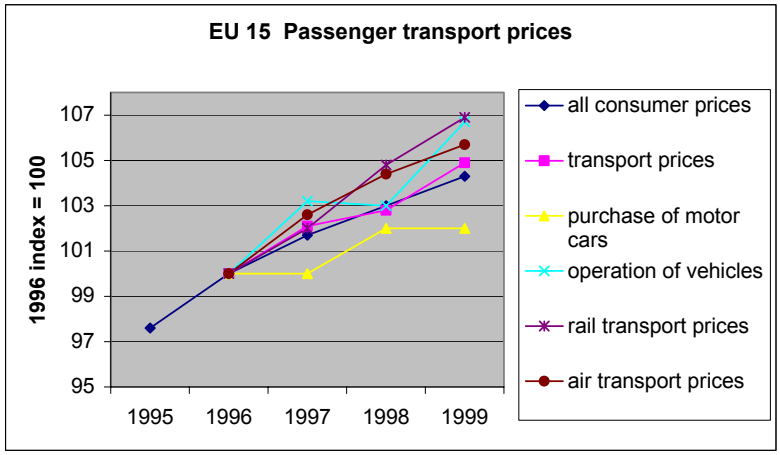
weblinks

[To be added]

4.6. Real changes in the price of passenger transport

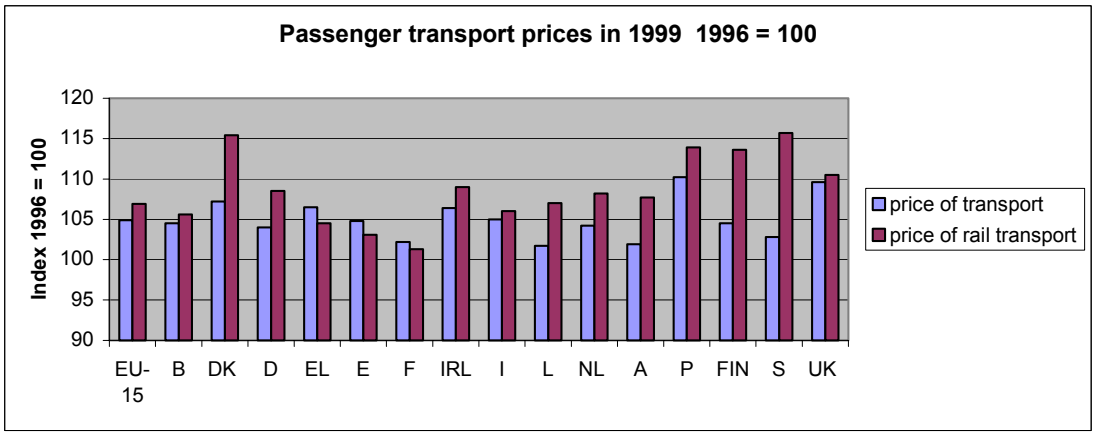
[Note - More data may become available from CE DELFT]

Figure 4.10. Passenger transport prices, EU15



Source: Eurostat

Figure 4.11. Passenger transport prices in 1999 relative to 1996



Source: Eurostat

[Designer: switch axes to make horizontal bars. Country names in full. Change country order to run from those with least gap to those with most and place EU15 bar in sequence]

European policy action on transport pricing is attempting to influence businesses and citizens to make decisions through price signals by ensuring that transport prices reflect all relevant costs and address efficient charging for transport infrastructure (European Commission, 2001c). Internalising external costs requires that:

- The price of transport services should include the marginal external cost imposed on society (accidents, congestion and environmental impacts, that in most cases do not have any direct market evaluation);
- When the price of a transport service does not comply with the principle defined above, the public authority should introduce efficient policy tools to achieve this result (e.g. through taxes and charges, or subsidies, or through setting tradable polluting permits).

Most Member States are considering refocusing transport related charges and taxes to internalise external costs but there are difficulties in determining the most appropriate tax framework and charging and taxation levels and strong objections from automobile lobbies. Existing

internalisation measures concentrate on air pollution from road transport and noise emissions from aviation. The internalisation of environmental costs by public transport remains an issue.

Between 1995 and 1999 rail transport prices have risen more than the general consumer prices index and also more than the average price of all transport modes across most countries. Indeed in the UK and Denmark, for example, the gap between the average price of car transport and the average price of collective transport (bus and train) has increased during the last 20 years. Freight transport prices, in The Netherlands, have also been decreasing in real terms.

These trends favour neither a wider use of public transport nor a decoupling of transport volumes from economic growth. Inequitable pricing structures across modes therefore remain a major barrier to encouraging a shift in modes, shifts of demand away from peak periods and increases in occupancy rates.

Smiley box

☹ The price of rail and other public transport has increased more than the price of car transport. This has not encouraged the use of the more environmentally-friendly modes.

Quality information

2: Further work is required to enable a comparison to be made taking into account differences in purchasing power across countries.
[Note that the above score has been generated for Signals 2002 as quality scores not available in the factsheet]

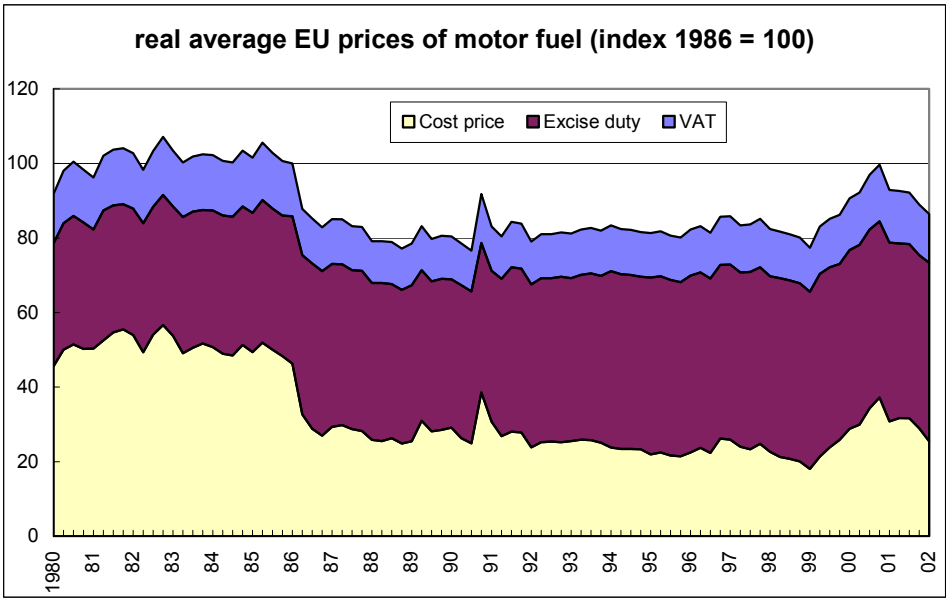
Weblinks

[To be added]

4.7. Real changes in fuel taxation

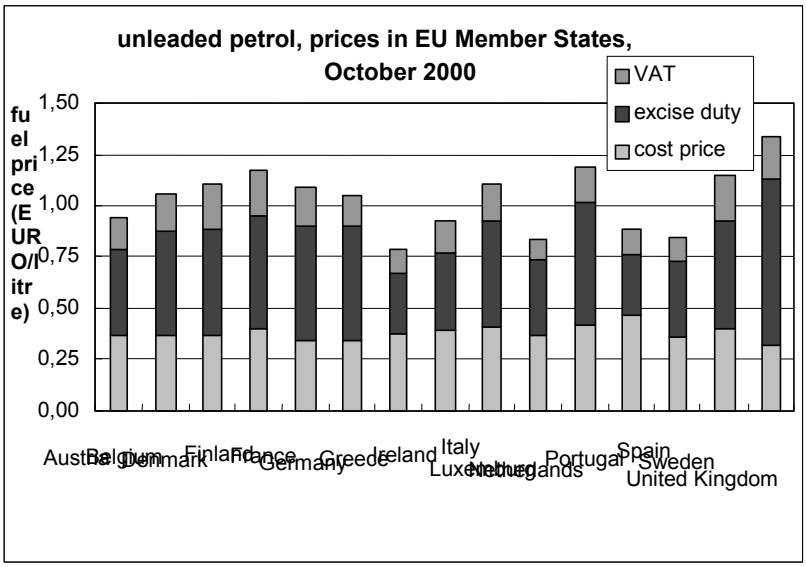
[Note - More data may become available from CE DELFT]

Figure 4.12. Real average prices of motor fuel, EU15



Note: Index 1986 = 100
Source: Eurostat (processed by CE Delft)
[design note: write years in full i.e. 1985, 2000]

Figure 4.13. Unleaded petrol prices in October 2000



Source: Eurostat, 2001

[design notes: switch axes to make horizontal bars. Replace commas with full stops in y axis numbering. Re-order from lowest to highest on excise + VAT. Colour and key need attention]

Fuel taxation remains the only pricing instrument used throughout the EU that is related to vehicle usage. Road pricing schemes are also related to vehicle usage, but their application is limited to motorways in some Southern European countries (e.g. France, Italy) and to some urban situations.

Fossil fuel consumption is directly linked with carbon dioxide emissions, the primary greenhouse gas. Therefore fuel taxes, originally instruments of fiscal policy, are increasingly seen as instruments to reduce greenhouse gas emissions and minimum tax levels have been promoted by the EU (European Commission, 1997) and through the European Climate Change Programme (ECCP) (see also Chapters 6 and 9). Until now fuel taxes have been mainly used to promote cleaner fuels and improved fuel efficiency. In this context, several Member States are using taxation to promote low or ultra-low sulphur fuels to attain the standards set for the 2005 by Directive 98/69 (see Chapter 16).

Despite the fact that nominal fuel prices, and certainly nominal fuel taxes, have been rising over the past two decades, and despite the spike in fuel prices during the last months of 2000, the inflation-corrected EU average price of road fuel in October 2000 was lower than in the first half of the 1980s. This has been caused by:

- pre-tax fuel prices being slightly lower in real terms than 20 years ago; and
- a move to cheaper fuels: the fuel 'mix' has moved from the relatively expensive leaded petrol to the cheaper unleaded petrol and diesel fuel;

The UK, France and The Netherlands experienced an increase in the real price of both unleaded petrol and diesel compared with 1980-1985. Italy, Greece and Denmark had substantially increased diesel prices, but decreased petrol prices; Portugal and Ireland saw decreased real prices of both unleaded petrol and diesel. Complete data for Austria, Sweden and Finland were not available for the period.

Research has suggested that a 1% increase in the petrol price will, in the long run, reduce petrol consumption and hence carbon dioxide emissions by 0.4 to 1.0%, compared to the situation where prices do not change (Goodwin, 1992; Johansson et al., 1997; Hager Bailly, 1999). This reduction is due mainly to the increased attractiveness of fuel-efficient vehicles.

[Possible green box: the introduction of differential taxation for new fuel types (e.g. LPG in the UK)]

Smiley box

😐 Current trends in fuel prices do not encourage fuel-efficient driving, but tax differentiation helps to promote the use of cleaner fuels.

Quality information

[No quality scores given in factsheets].

weblinks

[To be added]

References and further reading

CE Delft, 2000 (using Eurostat). *Fuel prices and excise duty policies in European road traffic, 1980-1999 (Oil Bulletin* Volumes 1980-1999 plus 2000 data from Eurostat). CE Delft, Delft, the Netherlands (http://www.ce.nl/eng/publicaties/99_4600_27.html).

DETR, 1998. *A New Deal for Transport Better for Everyone*. The Government's White Paper on the Future of Transport. Department of Environment, Transport and the Regions. United Kingdom, 1998 (http://www.detr.gov.uk/itwp/index.htm).

European Commission, 1997. *Proposal for a Directive on the Taxation of Energy Products* (COM 97 (30)). Commission of the European Communities. Brussels, Belgium.

European Commission, 2001a. *Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions on the sixth environment action programme of the European Community - 'Environment 2010: Our future, Our choice' - The Sixth Environment Action Programme* (COM (2001) 31 final). Brussels, Belgium (http://europa.eu.int/comm/environment/newprg/index.htm).

European Commission, 2001b. *A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development* (COM(2001)264 final). Communication from the Commission

European Commission, 2001c. *White Paper - European transport policy for 2010: time to decide* (COM(2001) 370). Commission of the European Communities. Brussels, Belgium (http://europa.eu.int/comm/energy_transport/en/lb_en.html).

European Commission, 2001d. *Economic Evaluation of Sectoral Emission Reduction Objectives for Climate Change - Economic Evaluation of Emissions Reductions in the Transport Sector of the EU*. Contribution from AEA Technology Environment (Judith Bates, Christian Brand, Paul Davison, Nikolas Hill) to a Study for DG Environment, European Commission, by Ecofys Energy and Environment, AEA Technology Environment and National Technical University of Athens. Final Report, Update March 2001.
http://europa.eu.int/comm/environment/enveco/climate_change/transport_update.pdf

European Commission, 2001e. *EU Energy and transport in figures – Statistical pocketbook 2001*. European Commission Directorate General for Energy and Transport in cooperation with Eurostat. Luxembourg (http://europa.eu.int/comm/energy_transport/etif/index.html).

EEA, 2001. *TERM 2001 - Indicators Tracking Transport and Environment Integration in the European Union.* European Environment Agency (EEA), Copenhagen, Denmark (http://reports.eea.eu.int/term2001).

Eurostat (to be published). *Transport and Environment: Statistics for the Transport and Environment Reporting Mechanism (TERM) for the European Union, data 1980-1999*. Commission of the European Communities (Eurostat), Luxembourg [Version January 2002].

Goodwin, P. B., 1992. *A review of New Demand Elasticities with Special Reference to Short and Long Run Effects of Price Changes*. Journal of Transport Economics and Policy (pp 155-169), May 1992.

Hagler Bailly, 1999. *Potential for Fuel Taxes to Reduce Greenhouse Gas Emissions in Transportation, Fuel Tax Policies Report.* Prepared for Department of Public Works and Government Services, Science Directorate, Science, Informatics and Professional Services Sector. Canada, June 1999.

Johansson et al., 1997. *Measuring the Long-Run Fuel Demand for Cars.* Journal of Transport Economics and Policy, Vol. 31, No. 3, p. 290. Johansson, O. and Schipper, L.

4. Transport

policy issue	indicator	assessment
decoupling transport volume growth from economic growth	passenger-km per GDP	☹
- " -	tonne-km per GDP	☹
shifting the balance between transport modes from road to rail and inland waterways	modal split of passenger transport	☹
- " -	modal split of freight transport	☹
reducing use of resources and emissions that damage the environment	transport eco-efficiency	😐
shifting to improved technologies and fuels	uptake of cleaner technologies and fuels	☺
internalising external costs	differentiation of transport taxes and charges	😐
stimulating fuel efficiency	real changes in fuel prices	☹

Current trends are away from achieving the EU's recently-announced objectives of breaking the link between economic growth and growth in transport, and bringing about a shift in transport use from road to rail, water and public passenger transport. Alongside greater use of cars and planes, passenger transport is growing at a rate close to gross domestic product (GDP), while freight transport is growing faster than GDP.

These traffic trends, combined with little improvements in energy efficiency, result in growing energy use and greenhouse gas emissions. Transport is thus offsetting other sectors' efforts to reach the Kyoto targets. Advances in vehicle technology and fuels have resulted in a significant decrease in emissions of acidifying gases and ozone precursors, though in many cities air quality still poses health risks and further improvement is needed.

Several Member States are now moving towards tax structures that differentiate between the various transport modes in ways that reflect their environmental costs, but there remain significant barriers to implementation.

At its June 2001 summit in Gothenburg, the European Council singled out the transport sector as one of the four priority areas where sustainability policy development must be put on a faster track. The sector is also high on the agenda of the EU's sixth environment action programme and Sustainable development strategy. The recently published White Paper European Transport Policy for 2010: Time to Decide (European Commission, 2001a) proposes an action plan of sixty or so measures around four main themes:

- shifting the balance between modes of transport (improving the quality of the road sector, revitalising rail, controlling air transport growth and adapting maritime and inland waterway transport systems, linking up of transport modes);
- eliminating bottlenecks (developing the trans-European transport network);
- placing the users at the heart of transport policy (improving road safety, fair and efficient pricing through infrastructure charging and harmonisation of fuel taxation);
- managing the globalisation of transport (linking the future Member States to the trans-European transport network).

The proposed action programme aims mainly at stabilising the modal shares at

1998 levels by 2010. The White Paper suggests that this would also result in decoupling transport growth (in terms of vehicle-km) from GDP growth. However, no evaluation has been made of the effectiveness of the proposed measures, nor of their environmental gains. In 2002, the Commission intends to issue a communication with quantified targets for transport. An assessment of the implementation of the action programme and its socio-economic and environmental impacts will be made in 2005. Meanwhile, the transport and environment reporting mechanism (TERM) will continue to monitor the progress of the transport and environment integration process (EEA, 2001).

As stated above, the White Paper also identifies enlargement of the EU as one of the major transport policy challenges for the next ten years. Assessing the future impacts of enlargement first requires a good overview of the current status in the accession countries as well as in the EU; EU developments have been reported in previous TERM reports. This is a first step into gearing in the new countries into the TERM information system. A next step will be to report on the effects of enlargement in both regions.

In joining the European Union, the accession countries will also share the objectives of its Treaty. The new countries should therefore be actively involved in implementing the main policies such as the EU sustainability development strategy and the sixth environmental action programme, which both have transport as one of the priority concerns. The integration of environmental concerns in sectoral policies, which was initiated by the Cardiff Council in 1998, has become a major policy pillar of the SDS. The EU Transport Council therefore invited the accession countries 'to follow the integration principle as it is being developed in the Community when formulating national and local strategies during the pre-accession period' (European Council, 1999).

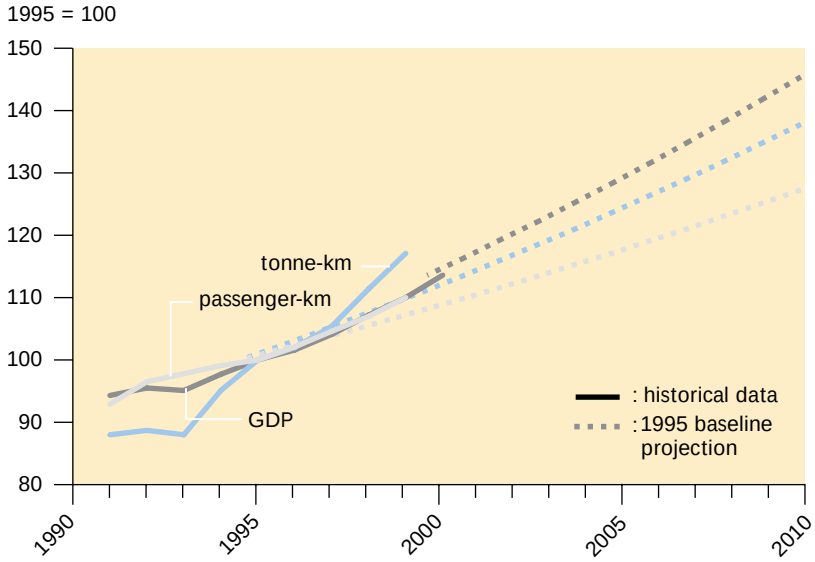
The Marco Polo programme

The Commission proposal for a Parliament and Council Regulation setting up the Marco Polo programme was announced in the White Paper (European Commission, 2001a) and adopted on 4 February 2002. The main goal of the ten-year Marco Polo scheme is to reduce road congestion and improve the environmental performance of the transport system by shifting freight from road transport to short sea, rail and inland waterway transport. The Commission proposes a budget of 115 million euros (2003 – 2007) to achieve this goal.

Taking into account the principle of subsidiarity, the programme will focus on international, rather than national, projects. Marco Polo funds would be offered to reduce the start-up costs of new, international non-road freight services and to stimulate co-operative behaviour in the freight logistics market. The programme will also be able to fund actions involving countries, which are candidates to accession to the European Union. It is envisaged that the Marco Polo programme will be fully operational by 2003.

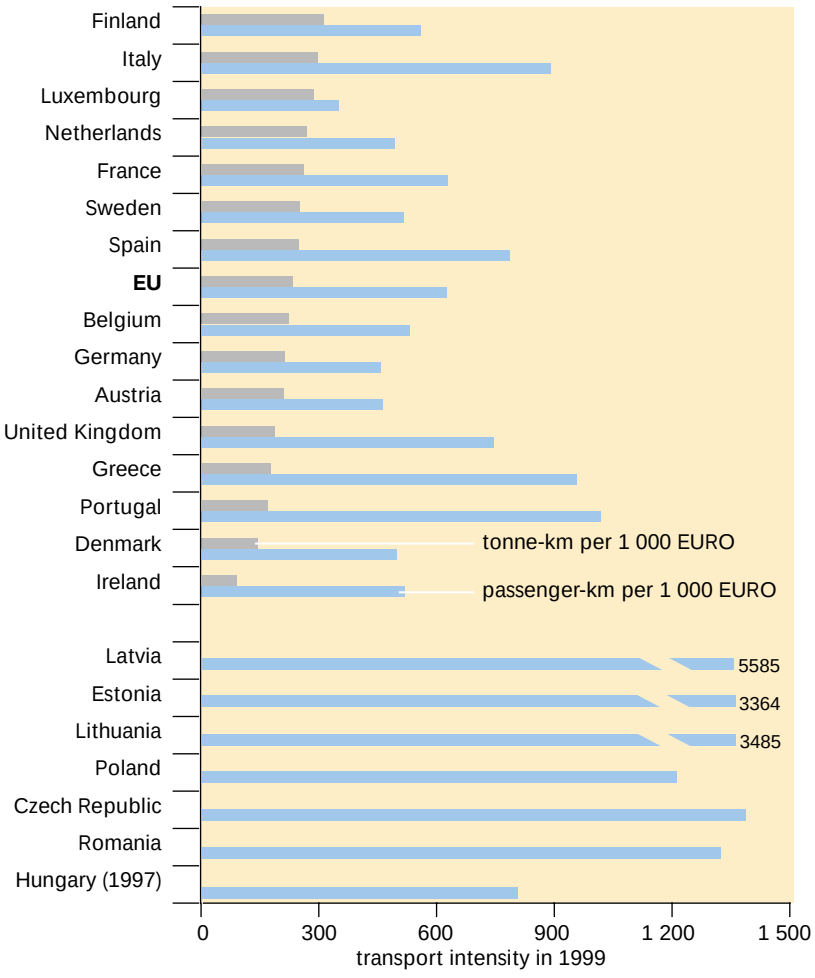
Source: http://europa.eu.int/comm/transport/themes/land/english/lt_28_en.html

Figure 4.1. **Passenger and freight transport and GDP, EU**



Note: Passenger transport includes road, rail and domestic, intra- and extra-European flights. Motorcycle and inland waterway transport are excluded due to lack of historical data, and tram/metro are not included since these modes are not included in the projection model PRIMES. Freight transport includes road, rail and inland waterways. Short-sea shipping and air freight transport are not included as these are not covered by the PRIMES projections.
Source: Eurostat, 2002; European Commission, 2001b

Figure 4.2. **Passenger and freight transport per GDP, 1999, EU and some accession countries**



4.1. Passenger and freight transport volumes

Passenger transport in the EU grew at the same rate as GDP (i.e. at an annual rate of 2.4 %) between 1995 and 1999 (slightly faster than GDP before 1995). Air and road transport are the fastest growing modes (with average annual growth of 6.9 % and 1.8 % respectively between 1991 and 1999). Leisure trips, commuting and shopping account for the vast majority of car trips. Distances to basic services increase as a result of spatial planning decisions (e.g. urban sprawl) (see Chapter 13). Car ownership, a main driving force for passenger car transport growth, has increased by 17 % between 1990 and 1999, closely linked to growing incomes and the increasing number of households (see Chapter 3). Another worrying trend is the rapid increase of powered two-wheelers, for which stricter emission standards come into force only in 2003.

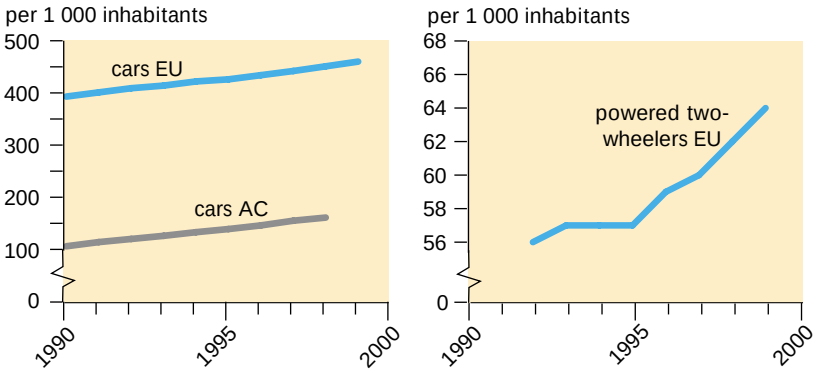
Tonne-km in the EU increased by almost 30 % between 1991 and 1999 (an annual average of 3.3 %) and thus grew much faster than GDP (1.9 % annually over the same period). Road haulage is the fastest growing mode of freight transport (4.7 % per year), followed by short-sea shipping (2.9 %). The globalisation of the economy and the liberalisation of the internal market result in more complex production and trading networks, and thus greater distances and more trips. Freight transport costs are often low compared to other production costs (e.g. storage costs and the benefits of timely delivery). This also encourages the shift of stocks from warehouses to roads.

Note: Passenger transport includes passenger car, bus/coach, rail, tram/metro and domestic aviation. Freight transport includes road, rail, inland water and oil pipelines. Short sea shipping and intra- and extra-European flights are excluded due to a lack of some country breakdown data. Accession countries: 1998 data.
Source: Eurostat, 2002; UNECE, 2001

According to 1995 baseline projections, future passenger travel is expected to decouple slightly from economic growth. The reasons for this include limits on the average travelling speed (due to safety concerns and congestion) and the expected saturation of car ownership in the Member States. The main assumption for the projected decoupling of freight transport demand and economic growth is a gradual shift away from industry towards a knowledge-based economy. However, the above-mentioned factors could counterbalance any benefits from this shift, as appears to been happening in most recent years (tonne-km grew faster than originally projected between 1995 and 1999).

EU enlargement is expected to increase transport flows within and between the accession countries and the EU significantly. The rapidly growing car fleet in accession countries, which grew by 52 % between 1990 and 1999 (UNECE, 2001), and the decline in rail and public transport which is observed in some countries (a decrease of 18 to 30 % in passenger-km), are indications of drastically growing car transport. Freight transport intensity dropped in almost all accession countries, but is still much higher than the EU average. After an initial decrease in the early 1990s, following structural changes in the economy and recession, freight volumes in the accession countries are now growing significantly. Increasing trade with the EU is expected to enhance this trend (IVM, 1998).

Number of passenger cars and powered two-wheelers, EU and accession countries Figure 4.3.



Source: European Commission, 2001b; UNECE, 2001

Teleworking is growing, and may help to avoid congestion

The European Commission intends to promote teleworking by accelerating investment in communications infrastructure and services (European Commission, 2001a). Currently, about 4 % of European employees are regular teleworkers, with the highest shares in the Scandinavian countries and the Netherlands. The UK and Germany are above the European average. Teleworking is lagging in Italy, France, Spain and Ireland.

The number of teleworkers is expected to rise to 11 % of the EU labour force by 2005. However, only a minority will use telework to reduce commuting trips ('telecommuting'). Other types of decentralised work like mobile telework are also important. Teleworking may affect location patterns, as it can lead to people moving to residences further away from work.

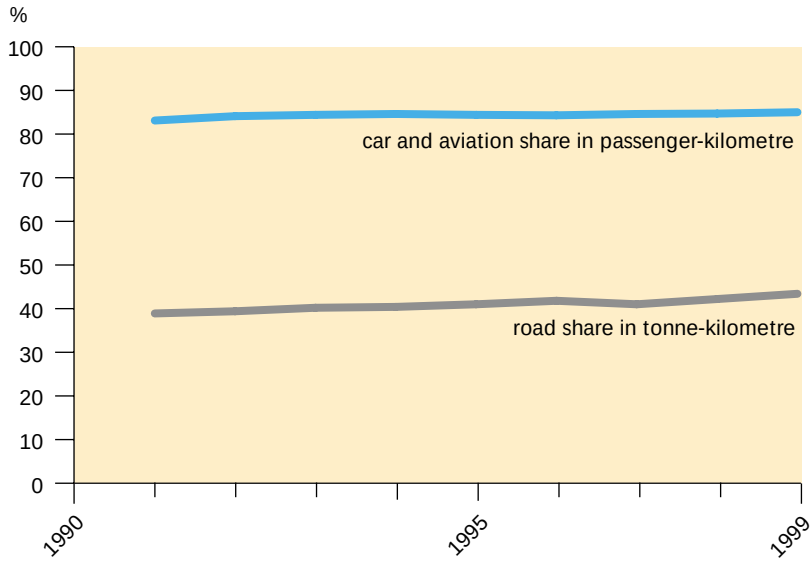
Source: EcaTT web site: http://www.ecatt.com/ecatt/

In the past decade, passenger transport volume has grown at the same rate as the economy, while freight transport growth outstripped it. By 2010, a slight relative decoupling is expected for passenger transport only.

Quality of information ☆☆

http://themes.eea.eu.int/Sectors_and_activities/transport/indicators
http://europa.eu.int/comm/energy_transport/en/lb_en.html

Figure 4.4. **Shares of road and air in passenger and freight transport, 1991–1999, EU**



Note: Passenger transport includes passenger car, rail, tram/metro, bus/coach and domestic and intra- and extra-European aviation; freight transport includes road, rail, inland navigation and short-sea shipping.
Source: Eurostat, 2002 ; statistics on Danish oil pipelines taken from European Commission, 2001b

☹ **Passenger transport continues be dominated by the car (75 % of total passenger-km), but air transport is now the fastest-growing mode. The share of the more environmentally-friendly modes (i.e. bus/coach, rail and tram/metro) is declining slightly.**

Quality of information ☆☆

http://themes.eea.eu.int/Sectors_and_activities/transport/indicators

4.2. Modal split in passenger and freight transport

As part of the Sustainable Development Strategy, the EU has set itself the goal of bringing about a shift in transport use from road to rail, water and public passenger transport. The White Paper aims at stabilising modal shares at 1998 levels by 2010, as a first step towards a shift in transport use from then onwards. The proposed measures include pricing, revitalisation of rail and inland waterways, promotion of inter-modality (through, for example, the Marco Polo programme) and investments in the trans-European transport network. However, it is unclear how far these measures will contribute to achieving modal stabilisation and the extent of the environmental gains that modal shifts will achieve.

Car transport, which is generally considered to be faster and more flexible than public transport, retains its dominant share of the passenger transport market. The slight drop in its share in passenger-km (from 77 % in 1991 to 75 % in 1999) is explained by the drastic increase in aviation, of which the share rose from 6 to 10 %, as a result of growth tourism and business travel. The share of public transport (i.e. rail, bus/coach and tram/metro) fell by 1 % in the period 1991–1999.

Between 1991 and 1999 the share of road in freight transport rose from 39 to 43 %. The shares of rail, inland waterways and oil pipelines have all decreased. The increase in road haulage can be explained by the requirements of modern production and trade patterns, which are geared towards 'just-in-time' delivery of goods, where transport speed and flexibility are essential. Furthermore, the road sector is liberalised to a great extent, while the rail sector is just starting to open up. In addition, the distance over which goods are transported by road is on average 110 km/tonne (European Commission, 2001b), a relatively short distance over which rail and inland waterways are less efficient.

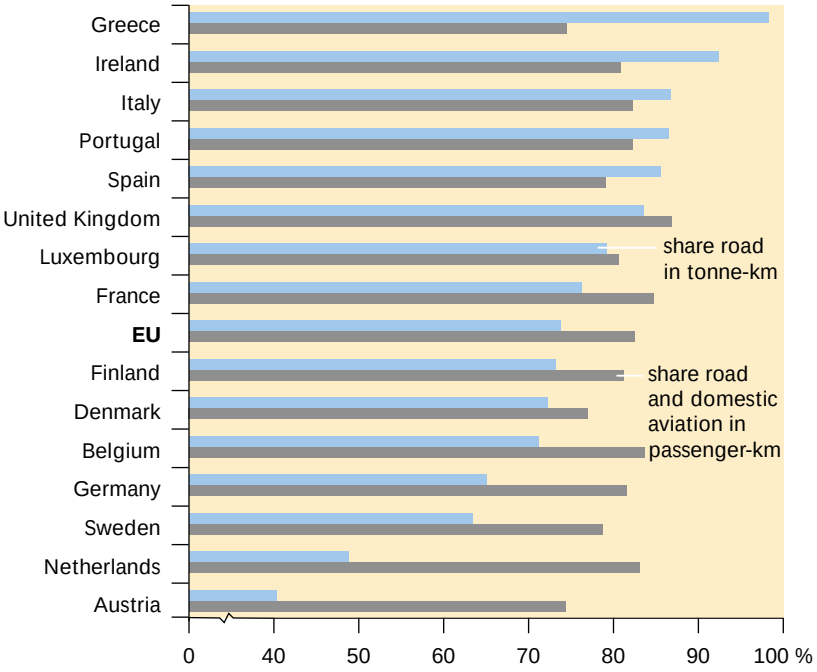
For longer distances, short sea shipping has become quite successful in some parts of the EU. To revitalise the rail freight sector the Commission has recently made proposals dealing with the liberalisation of the rail freight market and the development of a dedicated rail freight network (European Commission, 2002). However, growing concerns are being expressed regarding the environmental performance of shipping (in particular related to its high emissions of acidifying substances) as well as rail (in particular related to noise).

Incorrect pricing (i.e. price structures that do not correctly reflect the real costs to society) has also contributed to the distortion of the transport market to the advantage of road use and aviation (see Section 4.5). Infrastructure investments have enhanced this imbalance; investment shares have remained almost unchanged since 1980, dominated by road (62 % in 1995) and rail (28 % in 1995) (ECMT, 1999). Public transport received only a small part of all investments, high-speed rail being a notable exception.

In the accession countries, rolling stock and infrastructure are deteriorating due to investment shortages and problems related to the restructuring of railway and public service companies. As a result, the share of rail in freight transport, which in 1990 reached almost two thirds in some countries, is falling rapidly. The greatest part of investments in new infrastructures is allocated to roads, partly reflecting a very limited initial road infrastructure endowment in these countries. The motorway network in accession countries has grown by 94 % since 1990. The second largest share is taken by rail, in order to upgrade the infrastructure to western European standards. The extension of the trans-European transport network (the 'TINA' process) is focusing on the links connecting accession countries with the EU.

Passenger and freight transport: shares of road and domestic aviation, 1999, EU

Figure 4.5.



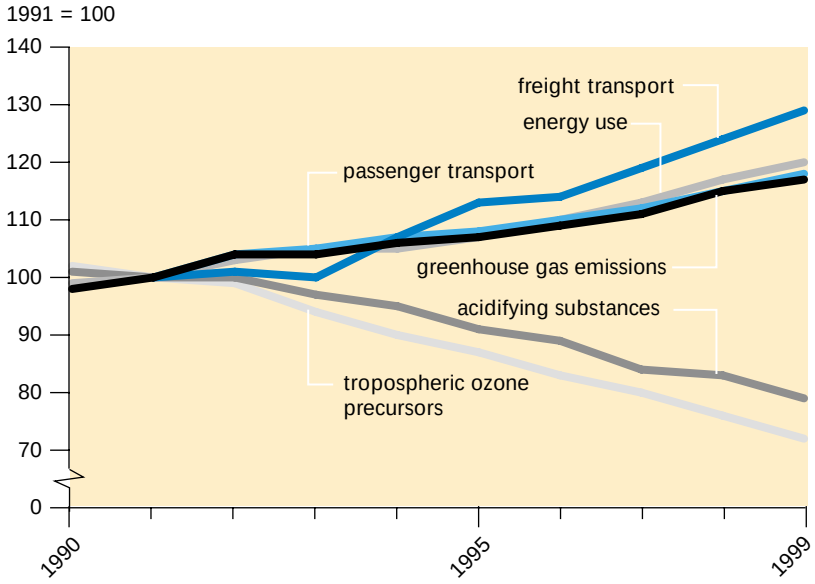
Note: Passenger transport includes car, bus/coach, rail and tram/metro, and domestic aviation. Intra and extra-European flights are excluded due to missing country breakdown of data. Freight transport includes road, rail, inland waterways and oil pipelines. Short sea shipping is excluded due to missing country breakdown of data.
Source: Eurostat, 2002

☹ **There is no sign as yet of a shift of freight from road to rail (rail's share fell from 10 % in 1991 to 8 % in 1999). Road haulage and short sea shipping remain the main freight transport modes, with a share of 43 % and 42 % of total tonne-km respectively.**

Quality of information ☆☆

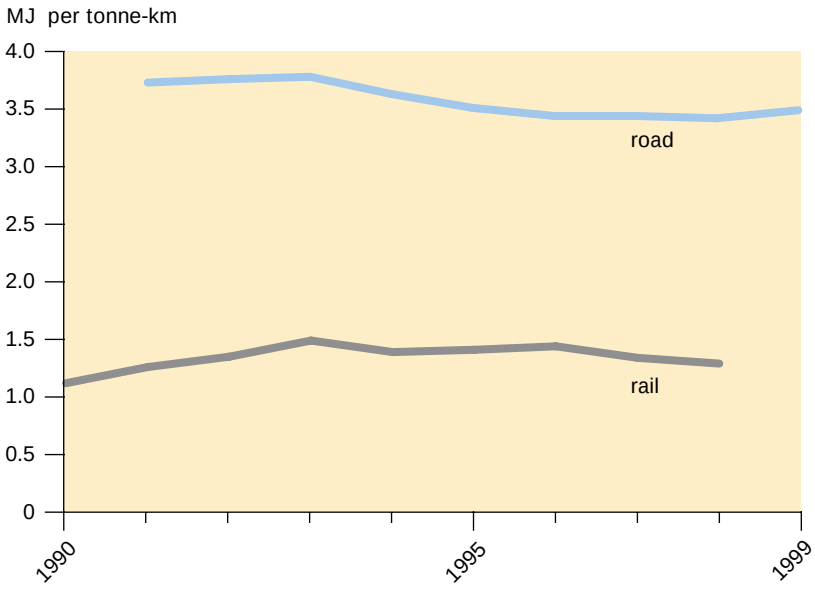
http://europa.eu.int/comm/transport/rail/index_en.html

Figure 4.6. **Eco-efficiency of transport, EU**



Note: Passenger transport includes car, bus/coach, rail, tram/metro and domestic, intra- and extra-European aviation. Freight transport includes road, rail, inland waterways short-sea shipping and oil pipelines.
Sources: EEA; Eurostat, 2002

Figure 4.7. **Energy efficiency in road and rail freight transport, selected Member States**



Note: Road based on weighted average of five Member States (Austria, Denmark, France, Sweden and the United Kingdom).
Source: ODYSSEE

4.3. Transport eco-efficiency

The energy efficiency of passenger car transport has improved slightly during the past decade, and as a result so has its average specific carbon dioxide emissions (EEA, 2001). The voluntary agreement with the car industry to reduce carbon dioxide emissions from new cars is making progress towards its target. Although the energy efficiency of rail has not been improved in recent decades, it remains the most energy-efficient mode of passenger transport. Despite technological progress during the 1980s, aviation continues to be the least efficient mode. The energy efficiency of road freight transport has not improved during recent years. Trucks consume significantly more energy per tonne-km than rail or ship transport.

The few gains in energy efficiency are offset by the growth in transport. Transport is the fastest-growing energy consumer in the EU; energy use since 1990 increased by 21 %, compared with 6.7 % for the remaining economic sectors. More than 30 % of final energy in the EU is now used by transport, which makes the sector a major source of greenhouse gas emissions. Transport is therefore one of the priority areas sectors for the Community's action plan to improve energy efficiency and the European Climate Change Programme.

Alternative and renewable energy sources for transport still have a low penetration. The European Commission aims at a 20 % substitution of diesel and gasoline fuels by alternative fuels (biofuels, natural gas and hydrogen) in the road transport sector by 2020 (European Commission, 2000a). Two Directives have been proposed recently: one setting a minimum level of biofuels as a proportion of fuels sold from 2005 (starting with 2 % and reaching 5.75 % of fuels sold in 2010); and the other providing a framework for reduced excise duties on biofuels. However, these plans have raised serious concerns, as the consequences on biodiversity can be detrimental and the impact on greenhouse gas and air pollutant emissions reduction remains uncertain.

In 1999, road transport contributed 25 % of total carbon dioxide emissions. Road transport is also a small but growing source of nitrous oxide emissions, a side-effect of the fitting of catalysts to passenger cars. Nitrous oxide emissions from transport more than doubled between 1990 and 1999 to 7 % of total emissions. A further substantial rise is expected by 2010. However, since transport is not a large source of nitrous oxide, this will not have a major impact on the overall trend of greenhouse gas emissions.

Between 1990 and 1998, EU greenhouse gas emissions from international transport (based on fuel sold in the EU to ships and aircraft engaged in international transport) increased by 33 %, to 5 % of total EU emissions. These emissions are not addressed under the Kyoto Protocol, but the International Civil Aviation Organisation and the International Maritime Organisation are currently examining options for their reduction.

Transport is also responsible for more than half of EU emissions of tropospheric ozone precursors and more than 20 % of emissions of acidifying substances. Technology and fuel improvements (in particular the introduction of catalysts and stricter emission regulations for diesel vehicles) have led to significant reductions in these emissions. Without these measures, nitrogen oxides emissions from traffic in the EU would have been 50 % higher in 1998. Extra efforts are however still needed, as urban air quality in most European cities remains poor (see Chapter 10).

Emissions from international shipping are currently not included in national inventories, but it is estimated that shipping in European waters contributed 24 % of total sulphur dioxide emissions and 22 % of total nitrogen oxide emissions from EU15 countries in 1998 (European Commission, 2000).

A large proportion of the population is exposed to traffic noise levels that can be annoying or harmful for health. The Environmental Noise Directive, which is expected to be adopted in 2002, would require countries to make noise maps for agglomerations, major roads, major railways and airports, by 2004. These would serve as a basis for the development of action plans to combat noise pollution. The expansion of infrastructure continues to take land from agriculture and urban use, affecting a wide range of designated natural sites and habitats (see Chapter 13).

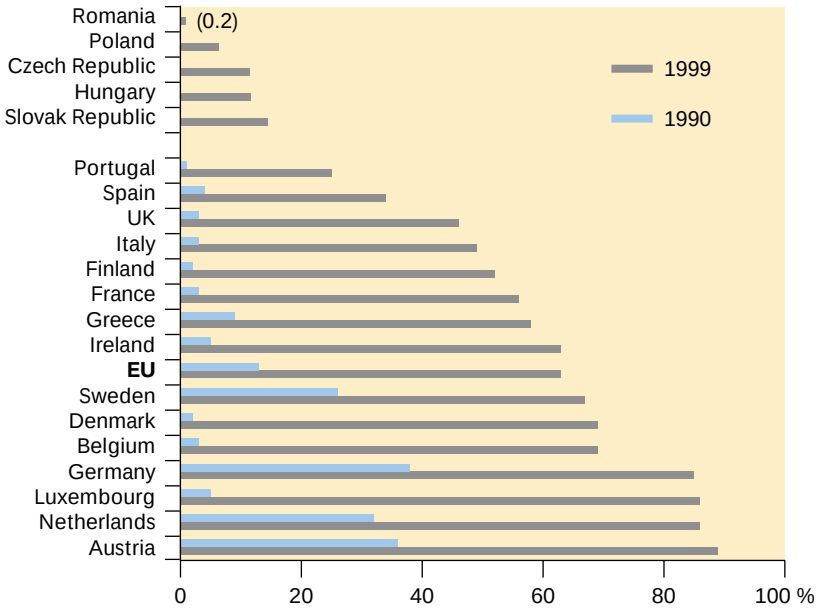
As a consequence of the major growth in transport, and the shift to road and aviation, carbon dioxide emissions from the transport sector are continuing to grow.

Cleaner technologies and fuels have led to significant reductions in emissions of local and regional air pollutants, but additional efforts are needed to reach targets

Quality of information ☆☆

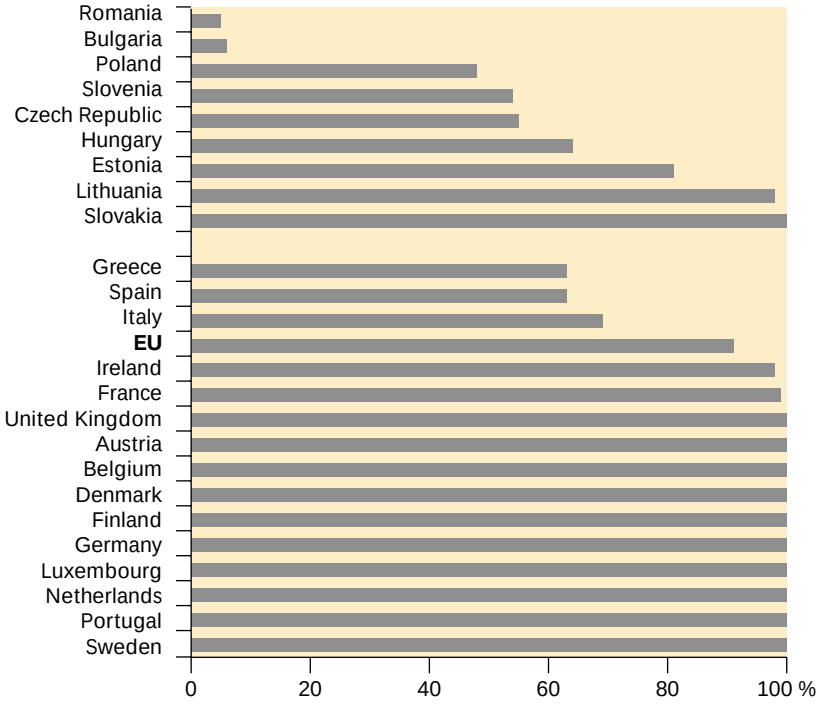
http://themes.eea.eu.int/Sectors_and_activities/transport/indicators
http://europa.eu.int/comm/environment/air/transport.htm

Figure 4.8. **Estimated share of petrol cars fitted with a catalytic converter, EU and selected accession countries**



Note: Accession countries 1996 and IRL, I, P, UK 1998
Source: Eurostat, 2002; REC,1998

Figure 4.9. **Share of unleaded petrol in total petrol deliveries, EU and accession countries**



Note: EU 1999 and accession countries 1996.
Sources: Eurostat, 2002; REC, 1998

Technology improvements, such as three-way catalysts, and cleaner fuels have made vehicles less polluting per transport unit.

Quality of information ☆☆

http://themes.eea.eu.int/Sectors_and_activities/transport/indicators
http://europa.eu.int/comm/environment/air/transport.htm

4.4. Uptake of cleaner technologies and fuels

Environmental regulation, through which vehicle emission standards have gradually been tightened and fuel quality improved, has been successful in reducing the emissions of certain air pollutants (see Section 4.3.). The penetration rate of new technologies is closely correlated with the average lifetime of vehicles and the average age of the fleet. Estimates based on the numbers of cars fitted with catalytic converters suggest that it takes at least ten years for a new technology to penetrate the entire car fleet.

In 1999, 63 % of petrol-driven cars had catalytic converters, although there were wide variations between Member States. The promotion of unleaded petrol, through a mixture of fiscal and regulatory instruments, is a major success story in the EU; it is expected that leaded petrol will be completely phased out by 2005 in the EU.

Compared to the EU, the car fleet in the accession countries has a high average age. In 1996, the share of passenger cars fitted with a catalytic converter in five accession countries ranged from zero to 14.5 %. The process of phasing out leaded petrol started five years later in the accession countries than in the EU, yet the Slovak Republic and Lithuania have already completed phasing it out. At the other end of the spectrum, in countries such as Romania and Bulgaria the share of unleaded petrol in 1996 reached only 5 %.

Currently a number of Member States are also promoting low or ultra-low sulphur fuels in advance of the EU standards in Directive 98/69, which comes into force in 2005. The main purpose is not to reduce sulphur dioxide emissions, which have already been substantially reduced in the past two decades, but to facilitate the introduction of advanced DeNO$_x$ and particulate filters.

4.5. Differentiation of transport taxes and charges

It is estimated that the external costs of transport amount to 8 % of GDP, with road transport accounting for more than 90 % of these costs (INFRAS/IWW, 2000). Accidents, noise, air pollution and climate change are the most important contributors. Costs of infrastructure and congestion are not included in this figure. The EU 'fair and efficient pricing' policy for the transport sector aims at the internalisation of external costs (European Commission, 2001a). This would encourage shifts to cleaner or safer vehicles or fuels, shifts of demand away from peak periods, safer driving, more efficient logistics, and increases in occupancy rates and load factors.

To be effective, internalisation instruments should be location-, time- and mode-specific, as social marginal costs differ for the various mode of transport, for various regions and times of the day and week. Shifting the burden from fixed taxes and charges, such as annual vehicle taxes or the annual ticket for motorway use, to variable taxes and charges, such as road cordon or kilometre pricing, is generally considered the most effective. Other tools can be modifications of existing taxes (e.g. differentiation of annual road tax according to energy efficiency) or the introduction, reduction or removal of subsidies. In 2002, the Commission will propose a framework Directive to establish the principles of infrastructure charging and a pricing structure for all modes of transport, including new regimes for road user charges, airport charges and air transport services charges (European Commission, 2001a).

Differentiated transport taxes and charges are currently applied mostly in the road sector on air pollution, and on aviation noise. Some schemes also exist for other modes. Finland applies track access charges on freight rail transport, differentiated according to marginal environmental and accident costs. Many EU airports raise a surcharge on landing fees that is differentiated according to noise levels. For some domestic flights, Sweden operates a surcharge on certain air emissions. Finland, The Netherlands, Portugal, Spain, Sweden and the UK have differentiated harbour fees favouring ships with a Green Award, or ships that have reduced nitrogen oxides and sulphur dioxide emissions.

Germany operates an annual vehicle tax differentiated by Euro class, as to emissions and noise. For passenger cars a variety of tools is in operation. Austria, Denmark and the UK have differentiated the annual road tax according to fuel consumption and carbon dioxide emissions. The Netherlands grants a reduction of the sales tax for the most fuel-efficient cars in their class.

Switzerland has introduced a distance-related fee for heavy duty vehicles on all roads effective from January 2001. In the Member States, road pricing schemes (other than road tolls on main highways) or kilometre charging have not yet been introduced, but systems are being developed in Germany, Austria and the Netherlands.

Fuel taxes can be used for internalising the external costs linked to carbon dioxide emissions, but are less well suited for internalising other externalities, as fuel taxes cannot be differentiated according to vehicle and trip characteristics (see Section 4.6). However, fuel tax differentiation has been used successfully in promoting a shift to from leaded to unleaded petrol. In road freight transport many countries have reduced the tax for low-sulphur diesel. A reduced tax on low-sulphur diesel is applied in The Netherlands and a reduced tax for clean petrol operates in Belgium and Denmark.

Table 4.1. Transport tax/charges differentiation in the Member States

		A	B	DK	FIN	F	D	EL	IRL	I	L	NL	P	E	S	UK
Non fuel-related taxes and charges																
Air pollution	Rail transport				✔											
	Aviation														✔	
	Water transport				✔							✔	✔	✔	✔	✔
	Road freight	✔	✔	✔			✔					✔			✔	✔
	Road passenger		✔	✔		✔	✔					✔			✔	
CO_2	Rail transport				✔											
	Aviation															
	Water															
	Road freight															
	Road passenger	✔		✔								✔				✔
Noise	Rail transport															
	Aviation	✔	✔			✔	✔			✔	✔	✔			✔	✔
	Water transport															
	Road freight	✔					✔									
	Road passenger															
Congestion (**)	Rail transport															
	Aviation															
	Water transport															
	Road freight															
	Road passenger															
Total number of measures (excluding fuel taxes)		4	3	3	3	2	4			1	1	5	1	1	5	4
Fuel taxation																
Lower fuel tax for unleaded petrol		(*)	(*)	(*)	(*)	(*)	(*)	✔	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Lower fuel tax for low-sulphur diesel or petrol			✔	✔	✔		✔					✔			✔	✔
Carbon tax on diesel and petrol					✔					✔						

✔ Countries that have or are introducing differentiated tax/charge schemes aimed at charging the user of transport services with the marginal external costs (i.e. environment, accidents and congestion costs) of the trip. Only instruments introduced at the national level are included, excluding e.g. parking fees and local road tolls.

(*) Leaded petrol no longer on the market.

Several countries apply tax differentiation schemes with the purpose of internalising the external costs of transport. The focus, however, is on air pollution from road transport and noise from aircraft.

Fuel tax differentiation has been successfully applied to promote the use of cleaner fuels.

Quality of information ☆☆

http://themes.eea.eu.int/Sectors_and_activities/transport/indicators
http://europa.eu.int/comm/transport/infr-charging/charging_en.html

4.6. Real changes in fuel prices

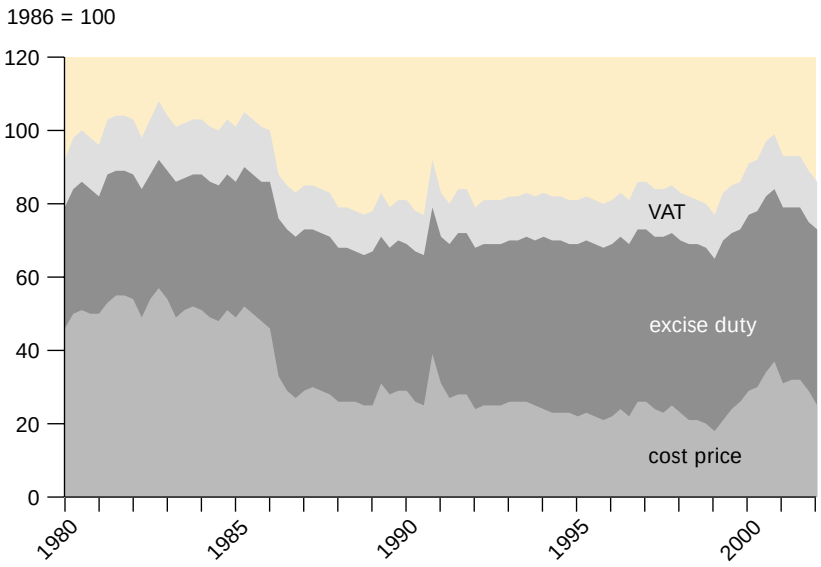
Fossil fuel consumption has a direct correlation with carbon dioxide emissions. Higher fuel prices can encourage the purchase of more fuel-efficient vehicles, and thus help to reduce fuel consumption. However, the impact of fuel prices on travel demand seems much less. Research has suggested that a 10 % increase in petrol price will, in the long run, reduce fuel consumption by 5 to 10 %, but would lead to only a 1 % to 3 % reduction in travel demand (IEA, 2001).

After the increase in the last months of 2000, fuel prices dropped again. Although trends vary among countries, the inflation-corrected EU average price of road fuel in early 2002 was lower than in the first half of the 1980s. The petrol price is significantly lower than 25 years ago, whereas the price of diesel is slightly higher. The share of taxes in prices at the pump has increased, in particular for diesel, preventing fuel prices falling as low as they would have under market forces only.

Tax regimes vary between countries, and in addition to fuels taxes, countries apply various other transport taxes and charges (Section 4.5). An increase or decrease in fuel taxes will therefore have a different effect in each country. The fuel tax competition provoked by 'tank tourism' between countries makes it furthermore difficult for individual countries to levy sufficiently high charges for internalisation (ECMT, 2000). The high excise duties in the UK are explained by its isolated position, which makes tank tourism difficult. The European Commission intends to propose a uniform taxation for commercial road transport fuel by 2003.

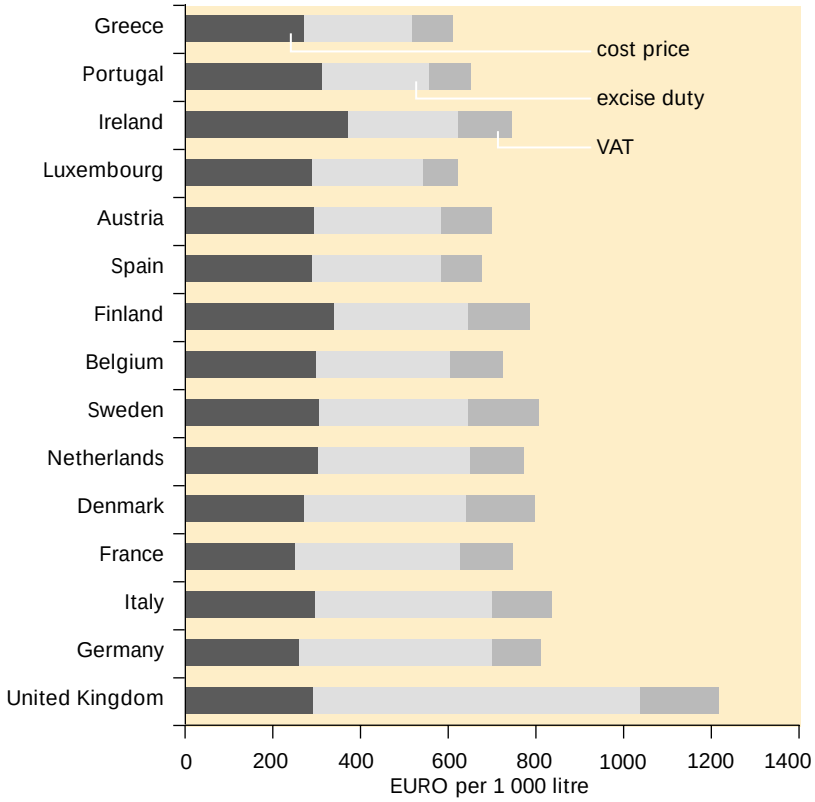
Fuel prices are, however, less appropriate instruments to internalise externalities other than the effects of climate change, as this requires a differentiation on the basis of vehicle type, time of the day, and location. Nevertheless, fuel tax differentiation has proved to be successful in promoting a shift towards cleaner fuels.

Real average prices of motor fuel, EU Figure 4.10.



Notes: petrol and diesel average combined
Source: Eurostat (processed by CE Delft)

Diesel prices in January 2002, EU Figure 4.11.



Source: Eurostat (processed by CE Delft)

The inflation-corrected EU average price of road fuel in early 2002 was lower than in the first half of the 1980s. This trend does not encourage fuel-efficient driving.

Quality of information ☆☆☆

http://themes.eea.eu.int/Sectors_and_activities/transport/indicators