



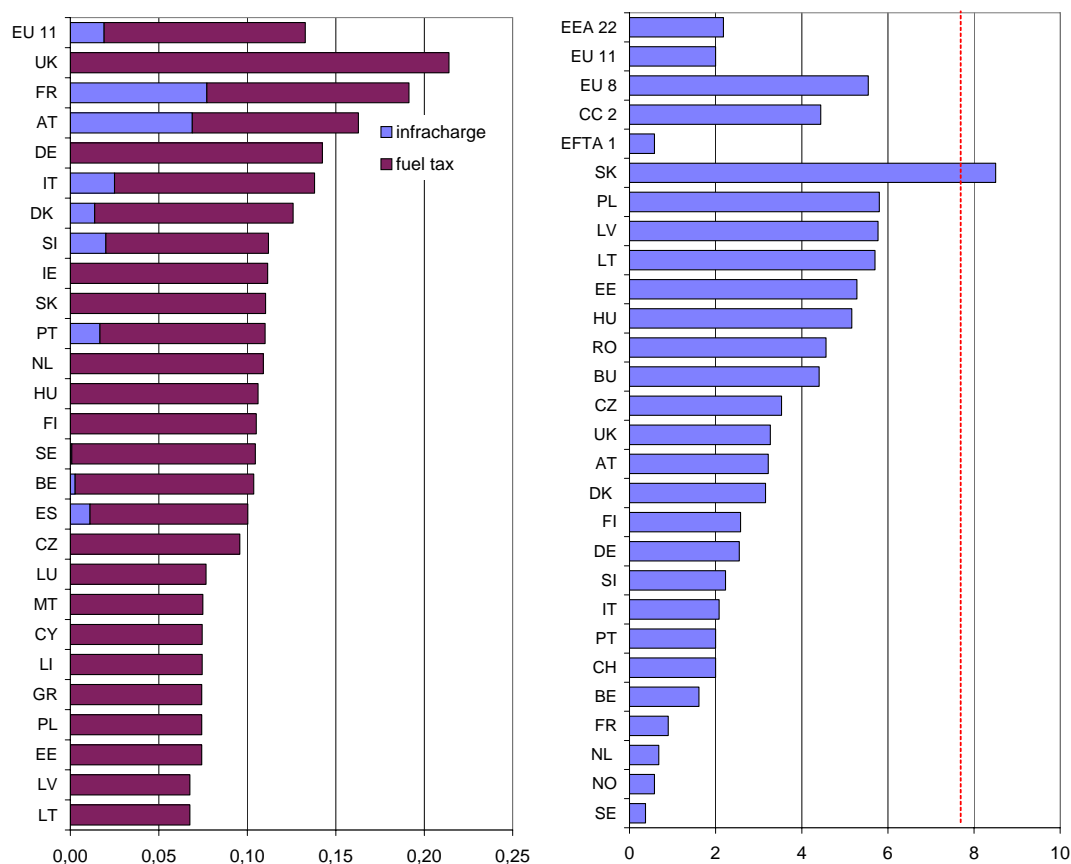
Indicator fact sheet

TERM 2006 22 — Progress in charge levels

Indicator code / ID	
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- ☹ **With the introduction of infrastructure charges for Heavy Duty Vehicles (HDVs) in Germany (2005) and Austria (2004) and a continuing increase in the length of motorway network tolled, average variable charges in the road sector are moving slowly in the direction of social marginal cost levels. Charge levels for rail freight transport have increased after Directive 2001/14/EC came into force. Remarkable are the higher infrastructure charge levels for rail freight transport in new Member States countries compared to the EU-15. In general, charge levels are still well below marginal cost levels.**

Figure 1: a) Overview of distance related charges in selected countries for road freight transport (EUR / vehicle-km) in 2004 b) infrastructure charges in selected countries for rail freight transport (EUR / vehicle-km) in 2005



Note: For road, EU 11 relates to EU-15 minus LU, IE, GR, UK. No average for EU-10 countries could be calculated due to lacking data for weighting. No information on average infrastructure charge levels for Greece, Ireland and the UK. Because the base year is 2004, the Maut in Germany has not been included. Note that marginal cost estimates for a HDV vary between € 0,26 and € 0,92, depending on the situation, see TERM 25 External costs of transport. Data for CH will be included as of next year. For countries not included in the graph, no data is available. For rail, EU 11 is EU-15 minus LU, ES, GR and IE. EU 8 is EU-10 minus CY and MA which have no rail infrastructure. CC 2 refers to Bulgaria and Romania, EFTA 1 refers to Norway. Data on energy taxes is generally not available and therefore not included. The rail toll charges paid in Denmark and Sweden have not been included. The red dotted line at € 7,75 marks the average estimate for marginal external cost of a freight train in the EU 15. *Sources:* TERM 21 Fuel prices and taxes; ECMT (2005), adaptation of CE Delft primary data search; TERM 25 External costs of transport, ASECAP, 2006.

Results and assessment

Policy relevance

An aim of transport pricing policy is to maximise socio-economic welfare, i.e. reduce negative impacts of transport whilst respecting its benefits. Most EU transport policy documents implicitly or explicitly do mention this (European Commission, 1995; European Commission, 1998; European Commission, 2001, European Commission, 2006a). To reach this, transport charges should reflect social costs (including external costs) in both level and structure.

Policy context

The Commission's 1995 Green Paper on 'Fair and efficient pricing in transport' (European Commission, 1995) announced that infrastructure charging policy should in principle aim at full cost recovery, covering both capital costs (and not current expenditures) and operating costs. The Commission's 1998 White Paper on 'Fair Payment for Infrastructure Use' (European Commission, 1998) continued this line by introducing the marginal social cost (MSC)¹ pricing as the leading principle for Europe's transport charging policy. The recovery of infrastructure cost is no longer an aim in itself, but now presented as a likely consequence of the MSC-pricing strategy.

The European Parliament underlines in its response to the 1998 White paper the main principles of transport pricing policy as proposed by the Commission. However, it adds a few extra boundary conditions, such as taking into account the interests of remote areas and islands, disabled people and transport services with a public interest (so-called public service obligations).

The ECMT supports maximising social welfare, or so-called 'internalisation of external costs', and considers that the main aims, besides economic efficiency and sustainability, is to promote fair competition between modes and countries. It recommends a gradual shift in charge structures to increase the share of more territorially based charges, such as tolls, electronic kilometre charging and urban road pricing (ECMT, 2004).

It should be noted that economic instruments such as charging are not the only tools to increase socio-economic welfare. However, they have the advantage over more regulatory instruments by leaving final transport decisions to the transport user. This flexibility can lead to more efficiency and thus greater socio-economic welfare.

The agreed amendment of the Directive for road infrastructure charging (European Commission, 2006b) allows Member States to base their average charge levels on full infrastructure costs. Toll rates may be varied for the purpose of providing incentives to reduce combating environmental damage, congestion, infrastructure damage and to optimise the use of infrastructure and promote road safety. Member States are furthermore required to vary tolls according to vehicle emissions as of 2010. This is a step towards the MSC-pricing principle, since the fuel tax compensates the inappropriate charge level. (Kågeson, 2003). Mark ups up to 25% may be introduced in sensitive mountainous areas. Member States are recommended to use the revenues for the development of the transport network as a whole.

For aviation, at the Assembly of International Civil Aviation Organization (ICAO) of October 2004 a new resolution was adopted. With respect to market-based measures to curb emissions from air transport, ICAO urges States not to introduce fuel taxes or distance-related charges for international flights. Contracting States are also urged to refrain from unilateral implementation of greenhouse gases charges prior to the next Assembly in 2007.

Environmental context

The key question of transport charging policy is: are transport taxes and charges imposed on each individual transport movement becoming better aligned (in terms of structure and level) with marginal unpaid or external costs? This fact sheet focuses on the charge levels. Transport charge structure are discussed in TERM 26 EU – Progress in charge structures and internalisation policies.

¹ MSC equals marginal private costs plus marginal external (and infrastructure) costs

The charge levels tell us how much transport is charged. This is relevant because in transport charges may be passed on to transport user prices and hence reduce demand for fuel and transport within the relevant mode. This could eventually lead to either a modal shift, or to a net reduction of demand due to higher prices. Both effects reduce the negative impacts of transport.

Assessment

General

For all transport modes, there is a gap between the marginal infrastructure and other external costs (MEC) and the variable charge levels. For HDV transport and rail freight transport, charges levied are generally less than MEC. For inland shipping, charges are virtually non-existent. There is currently insufficient data to assess the gap between noise, air emission and infrastructure charges and marginal costs for the air mode.

For road, precise trends could not be analysed due to the fact that reliable data on mileages is unavailable. It is therefore unclear whether increased toll revenues in countries are due to an increase in charges per kilometre or a general increase in vehicle mileage. It is clear however, that with new charging schemes being introduced, the average charge level is increasing.

Although an ECMT analysis confirmed that there are large differences between countries in net effective rates of transport charges in the EU-15, it found that differences in labour and capital taxation cancel out most of the variation (ECMT, 2003).

Road freight transport

The charges levied for HDV transport in the EU-15 is, with the exception of the Great Britain and France, well below the best case estimates for marginal external cost (See TERM 25 EU – External costs of transport). Note that the marginal external cost of an average HDV-kilometre are substantially higher than in the best case situation of a very environmentally advanced truck travelling on the highway in a rural environment. However, each year the length of the tolled motorway network increases, and more and more countries are introducing distance-based variable charging. Germany has followed Austria and Switzerland in 2005 and the Czech Republic is also working on concrete plans.

Rail freight transport

There are considerable differences between the infrastructure charges levied on rail freight transport, but with the exception of Slovakia, they are generally well below the average marginal external cost estimate. There is a striking difference in the charge levels in the EU-15 countries and those in the new Member States, with the former having substantially higher charge levels. This may be due to differences in infrastructure cost levels.

Inland shipping, sea-borne shipping and air freight transport

Port dues, airport landing and take-off fees and air navigation charges could be seen as covering infrastructure costs and (partly) internalising some of the marginal external cost at harbour and airport locations (noise, safety risks) since they are levied on individual ships and aircraft coming in and leaving the (air)port.

However, there is not much information available on port dues. Charges for the use of canals and rivers and fuel taxes for inland shipping are generally not levied due to the Mannheim convention (1868) ensuring freedom of navigation on the Rhine and its tributaries and exemption of duties levied on the act of navigation.

It is unclear how landing charges, emission, noise and navigation charges relate to the external cost of air freight transport. LTO emission charges in Sweden are based on external cost estimates, but the recently introduced charges at Heathrow and Gatwick are well below external costs levels. Fuel used for air transport is generally not levied, numerous bilateral air service agreements specifically forbid kerosene taxation. Both fuel for inland shipping and air transport are exempted from energy taxation (European Commission, 2003a).

Little information is available on the legal and economic feasibility of taxation of bunker fuels for seaborne shipping. However, given the high (approx. one third) share of fuel costs in total sea vessel operating costs, fuel taxation at national or regional level is likely to cause economic distortions and substantial tax avoidance behaviour. Therefore, only initiatives developed in the context of the International Maritime Organisation (IMO) stand a chance.

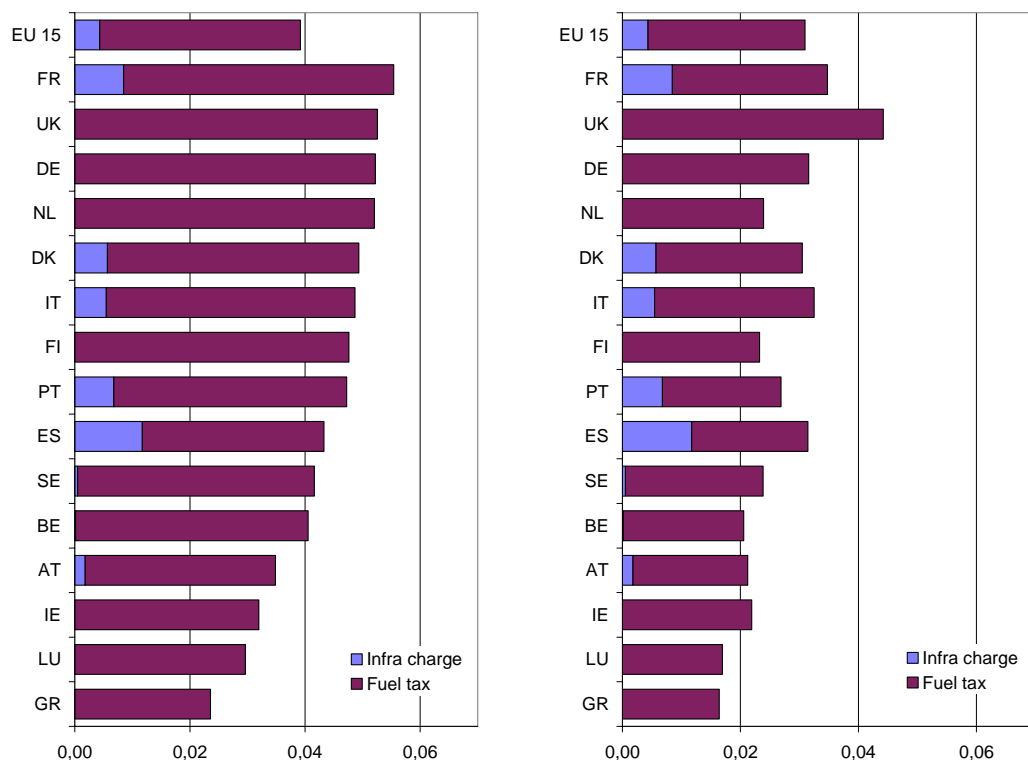
Sub-indicator: Progress in charge levels for passenger transport

☺ In comparison to freight transport, distance dependent charges in passenger transport are better in line with estimates of marginal external cost levels. For diesel passenger cars, the gap between marginal external cost and distance-related charges is generally larger than for petrol cars. Data on fuel prices in the new member states in 2003 were not available, therefore these countries could not be included. Charges for passenger transport by rail are, with some exceptions, better aligned with external cost levels than those for freight transport.

Figure 2: Distance related charges for EU-15 in 2003 (EUR/vehicle-km) for:

a) petrol passenger cars

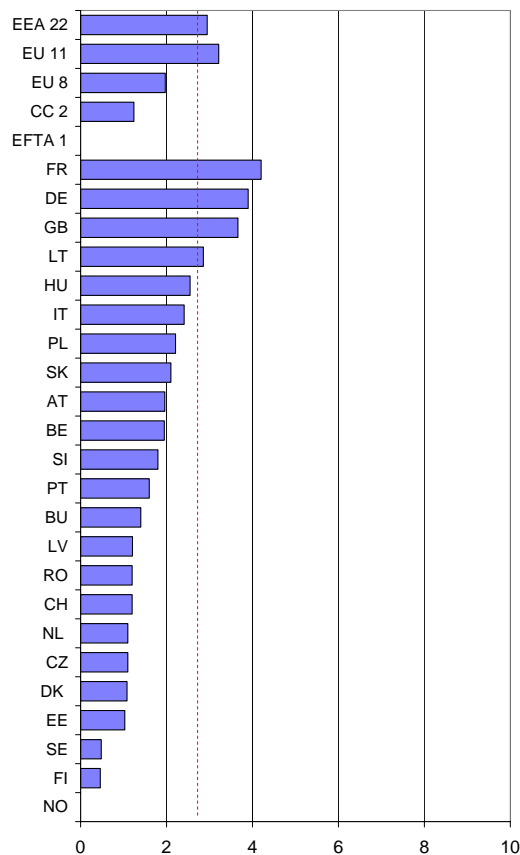
b) diesel passenger cars



Note: The variable charges have been calculated with EU-15 average fuel efficiencies. Tolls for Greece, Ireland and the UK could not be included in these figure due to lack of information. Note that worst and best case marginal cost estimates for a petrol car are €0,048 and €0,133 respectively, for a diesel passenger car €0,056 and €0,163, see TERM 25 EU External costs of transport. Road figures relate to 2003 due to time lag in statistics on traffic volume.

Source: ODYSSEE, 2006; Eurostat, different volumes; TERM 25 EU External costs of transport; ASECAP, 2006.

Figure 3: Infrastructure charges levied on rail passenger transport in selected countries in 2005 (EUR/vehicle-km)



Note: For rail, EU 11 is EU-15 minus LU, ES, GR and IE (no information on infrastructure charge levels for these countries). EU 8 is EU-10 minus CY and MA which have no rail infrastructure. CC 2 refers to Bulgaria and Romania, EFTA 1 refers to Norway. Toll charges for specific infrastructure constructions such as the Oresund link between Denmark and Sweden have not been included. The red dotted line at €2,68 marks the average estimate for marginal external cost of a passenger train in the EU 15, see TERM 25 EU External costs of transport.

Source: ECMT, 2005, TERM 25 EU External costs of transport.

Assessment

Road passenger

In several countries, distance related charges are in line with the level of marginal external cost for a best case situation in which these costs are minimal. In general, external cost levels are higher and charge levels are below the social optimal level (see TERM 25 EU – External costs of transport). The lower charge levels for diesel cars do not seem to be fully justified by the lower marginal cost level for these cars. In fact, the gap between charges and marginal external costs tends to be larger for diesel cars than for gasoline.

Note that the fuel tax is in itself only a second-best instrument to internalise the external costs of infrastructure, air pollution, accidents and noise. The fuel tax does not provide direct incentives to lower these effects. Therefore, closing the gap between MEC and variable charges should preferably be done with incentives-providing instruments such as differentiated kilometre charging.

It was not possible to calculate the distance dependent charges for EU-10 countries as a result of:

- The absence of necessary information on fuel taxes;
- The absence of fuel efficiency information of passenger cars.

Nor was it possible make a dynamic comparison in countries due to lack of reliable time series on fuel efficiency and total mileages.

Rail passenger

Charges for passenger rail differ widely across the EU. Although charge levels in most countries are below marginal external costs, average infrastructure charges in the EU appear to be in line with the average estimate of marginal external cost level due to the relatively large transport volumes in Germany, France, Italy and Great Britain.

Remarkably, despite the substantially higher infrastructure costs and marginal external cost of freight transport, average charges on passenger transport are higher than those on freight transport in the EU-15. In the EU-10 countries for which there is information available, the relation in charge levels between passenger and freight rail transport is much more in line with relative marginal external costs of both modes.

Air passenger transport

There is not much information available on charge levels for passenger air transport. Airport landing and take-off fees and air navigation charges can be seen as (partly) covering infrastructure costs and internalising some of the marginal external cost at airport locations (noise, safety risks) since they are levied on individual aircraft coming in and leaving the airport. In general, environmentally related charges are revenue-neutral, either because other airport charges are lowered at the time of introduction, or because it is a fee-bate system where operators of noisy / dirty aircraft pay a fee and others receive a rebate. The fuel used for air transport is generally not levied. It is exempted from energy taxation (Directive 2003/96/EC) and numerous bilateral air service agreements specifically forbid kerosene taxation. It is unclear how the level of landing charges, air navigation charges, noise and emission charges relate to the marginal external cost level.

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Data

	Freight			Passenger						
	Road HDV (2004)			Rail (2005)	Road (2003)			Rail (2005)		
	Infra	Fuel	Total	Infra	Infra	Gasoline	Total	Diesel	Total	Infra
EEA				2,18						2,95
EU 15	0,019	0,114	0,133	2,00	0,004	0,035	0,039	0,027	0,031	3,22
EU 10				5,54						1,97
CC3				4,44						1,24
EFTA 4				0,58						0,00
AT	0,069	0,094	0,163	3,22	0,002	0,033	0,035	0,019	0,021	1,96
BE	0,003	0,101	0,104	1,61	0,000	0,040	0,041	0,020	0,021	1,95
DE		0,142	0,142	2,55		0,052	0,052	0,032	0,032	3,90
DK	0,014	0,112	0,126	3,16	0,006	0,044	0,049	0,025	0,030	1,08
ES	0,011	0,089	0,100		0,012	0,032	0,043	0,020	0,031	
FI		0,105	0,105	2,58		0,048	0,048	0,023	0,023	0,46
FR	0,077	0,114	0,191	0,90	0,008	0,047	0,055	0,026	0,035	3,66
GB		0,214	0,214	3,27		0,053	0,053	0,044	0,044	
GR		0,074	0,074			0,024	0,024	0,016	0,016	
IE		0,112	0,112			0,032	0,032	0,022	0,022	
IT	0,025	0,113	0,138	2,08	0,005	0,043	0,049	0,027	0,032	2,41
LU		0,077	0,077			0,030	0,030	0,017	0,017	
NL		0,109	0,109	0,68		0,052	0,052	0,024	0,024	1,10
PT	0,017	0,093	0,110	2,00	0,007	0,040	0,047	0,020	0,027	1,60
SE	0,001	0,104	0,105	0,37	0,001	0,041	0,042	0,023	0,024	0,48
CY		0,075	0,075							
CZ		0,096	0,096	3,53						1,10
EE		0,074	0,074	5,28						1,03
HU		0,106	0,106	5,16						2,55
LT		0,068	0,068	5,70						2,86
LV		0,068	0,068	5,77						1,21
MT		0,075	0,075							
PL		0,074	0,074	5,80						2,21
SI	0,020	0,092	0,112	2,23						1,80
SK		0,110	0,110	8,50						2,10
IS										
LI		0,075	0,075							
NO				0,58						0,00
CH				2,00						1,20
RO				4,56						1,20
TR										
BU				4,40						1,40

Unit: EUR / 10 vehicle-km for road, EUR / vehicle-km for other modes

Source: Rail infra: ECMT, 2005; road infra: manipulation of ASECAP data and primary data search; fuel: TERM 21 Fuel prices and taxes.

Metadata

Web presentation information

1. Abstract / description / teaser: Distance-related charges for HDV's are well below marginal external cost estimates. Infrastructure charge levels for freight trains are lower in the EU-15 countries than in the EU-10.
2. Policy issue / question: An aim of transport pricing policy is to maximise socio-economic welfare, i.e. reduce negative impacts of transport whilst respecting its benefits. To reach this, transport charges should reflect external costs in level (and structure).
3. EEA dissemination themes: Transport
4. DPSIR: R

Technical information

5. Data sources: TERM 12, 13 and 21, CE Delft's fuel taxes database for fuel taxes, ECMT (2005) and ASECAP for infrastructure charges
6. Description of data:
Original measure units: original in Euro's per litre or Euro's per km, all calculated in Euro's per km of 2001.
Original file name: TERM 22 EEA32- Progress in charge levels.xls
Conversion factors applied: yes, see datasheet
7. Geographical coverage: EU-15 countries and CZ, HU, PL, SI and SK for road freight, EU-15 for road passenger and EU-15 (except IE, ES, LU and GR) and NO, CZ, HU, PL, SK, BU, EE and LV for rail.
8. Temporal coverage: 2003 for road, 2005 for rail
9. Methodology and frequency of data collection: data are collected ad hoc from various sources
10. Methodology of data manipulation, including making 'early estimates': Infrastructure charge levels for road estimated by using estimates for mileages based on best available information.

Quality information

11. Strengths and weaknesses (at data level): data on mileages and fuel efficiency scarce preventing trend analysis. The available data are highly manipulated.
12. Reliability, accuracy, robustness, uncertainty (at data level): 3
13. Overall scoring (give 1 to 3 points: 1 = no major problem, 3 = major reservations): 3
Relevancy: 1
Accuracy: 3 (data on marine and air is hardly available)
Comparability over time: 3 (no time series can be made)
Comparability over space: 3 (for many countries, no complete overview is available)

Future work

To analyse trends, more reliable data on mileages and fuel efficiency is needed, as well as information on the trends in marginal external cost. An alternative would be to focus on more basic indicators such as length of network tolled and total toll revenues. Fuel prices for the EU-10 are collected as of 2004, these will therefore be included in the analysis next year. An update of fuel consumption data per country would allow a better calculation of average charge levels for the different geographical areas. Toll charges on trains (besides infrastructure charges) should be included, this would require primary data search. A methodology is needed to include environmental charges for air transport. Primary information on charge levels at airports is also needed.