



## Indicator fact sheet

### TERM 2003 22 EEA 31 — Progress in charge levels

⊗ An assessment of trends in charges for the use of infrastructure by Heavy Duty Vehicles (HDVs) shows a downward trend in most EU Member States — except in Germany, the UK, Sweden and Denmark. This trend is undesirable as TERM indicator 25 shows that in most cases HDV charges are too low to cover marginal infrastructure and other external costs. The diesel tax is in quantitative terms still the most important instrument, but in Germany the HDV kilometre charge will also be an important means of internalisation when it will be implemented by 2004. Data on rail, shipping and air freight charges are currently insufficient for an assessment. Data on fuel taxes and tolls for ACs is hardly available and therefore, accession countries could not be included in the analysis.

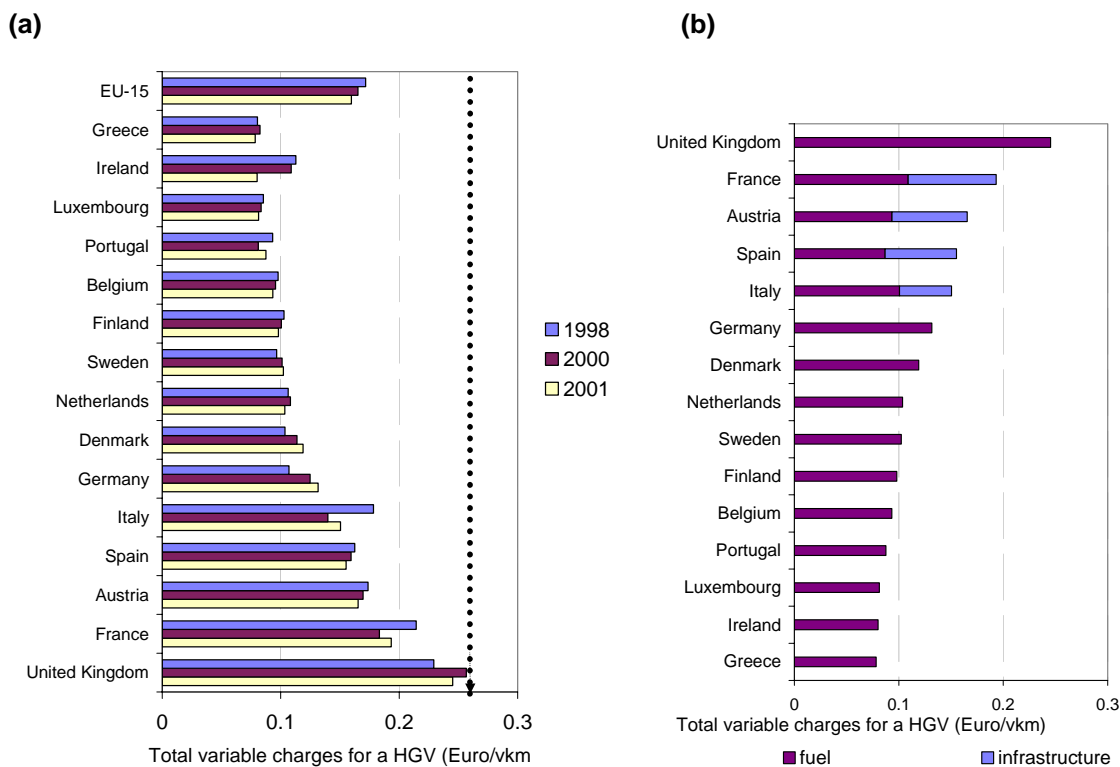
**Table 1: Overview of trend in gap between variable charges and MEC between 1998 and 2001**

Trend in gap between marginal external costs (MEC) and variable charges	EU total	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Sweden	UK
Light lorry, motorways	⊗ -	-	-	+	-	-	+	0	-	-	-	0	-	-	+	+
Heavy lorry, motorways	⊗ -	-	-	+	-	-	+	0	-	-	-	0	-	-	+	+
Light lorry, other roads	⊗ -	-	-	+	-	-	+	0	-	-	-	0	-	-	+	+
Heavy lorry, other roads	⊗ -	-	-	+	-	-	+	0	-	-	-	0	-	-	+	+
Freight train, electric	⊗ ?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Freight train, diesel	⊗ ?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Inland shipping	⊗ ?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Sea-borne shipping	⊗ ?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Air freight	⊗ ?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?

NB:

- gap becomes larger;
- 0 gap stays roughly equal;
- + gap becomes smaller.
- ? insufficient data for assessment

**Figure 1: a) Progress with distance related charges for heavy duty vehicles on highways in selected countries between 1998 and 2001 and b) structure of total charges for heavy road freight transport in selected countries in 2001.**



*NB:* For Portugal and Ireland, no infrastructure charges are included. All prices are 2001 prices. Trends in non-Eurozone Member States (Denmark, Sweden and UK) may partly be explained by changes in exchange rates.

The dotted line represents a 'best case' (lowest) estimate for marginal external and infrastructure costs (MEC) of a 40-tonne Heavy Goods Vehicle (HGV), derived from (Infras /IWW, 2000). See TERM 2002 25 — EU External costs of transport.

Source: ECMT, 2003; CE, 2003

## Results and assessment

### Policy relevance

An aim of transport pricing policy is to maximise socioeconomic 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). To reach this, transport charge levels should meet external costs.

### 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) <sup>(1)</sup> 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.

<sup>(1)</sup> MSC equals marginal external (and infrastructure) costs.

The recently proposed directive for road infrastructure charging (European Commission, 2003) would allow Member States to base their average charge levels on full infrastructure and external accident costs. These average levels may be differentiated on the basis of the number of axles, axle loads, engine Euro-class, time of day/level of congestion, environmental sensitivity, population density and accident risk. This comes close to the MSC-pricing principle, since the fuel tax compensates the inappropriate charge level. (Kågeson, 2003). But it should be noted that the proposal in principle addresses only freight transport on main itineraries, i.e. freight transport on all motorways that are part of the trans-European transport network;

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 does not specifically favour *marginal cost* <sup>(2)</sup> pricing (given the reference to the costs of infrastructure construction) and 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.

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 should be noted that economic instruments such as charging are not the only tools to increase socioeconomic welfare. However, they have the advantage over command-and-control type of instruments by leaving final transport decisions to the market instead of imposing them on the market. This flexibility leads to more efficiency and thus greater socioeconomic welfare.

### **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 factsheet focuses on the charge levels. Transport charge structure are discussed in TERM 26 EU — Internalisation of external 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 of a specific mode. This could eventually lead to either a modal shift, or to a net loss of demand via the so-called price elasticity of demand, and hence to less 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, the charges levied are generally less than the MEC. The gap between the charges and the MEC has grown for the EU-15 between 1998 and 2001 (see Figure 1a). There is currently insufficient data to assess the gap for the rail, shipping and air modes.

#### *Road freight transport*

The charge levied for HDV transport in the EU-15 is generally less than the marginal external costs this form of transport causes. Only in the United Kingdom, the level of variable charges is around the best case <sup>(3)</sup> (See TERM 2002 25 EU — External costs of transport) estimate of the external costs. In all other countries, there is a serious gap between the MEC and the levied variable charges that consist of fuel duties and in certain countries of (differentiated) tolls, see Figure 1b. In most countries this gap increased between 1998 and 2001, but in the United Kingdom, Sweden, Germany and Denmark the gap between the MEC and the variable charges declined, as a result of the increase of excise duties. In the Netherlands and Greece, the gap remained more or less constant.

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<sup>2</sup> ( ) 'Marginal costs' refers to the additional costs of one extra unit of mobility, one extra vehicle, vessel or aircraft kilometre.

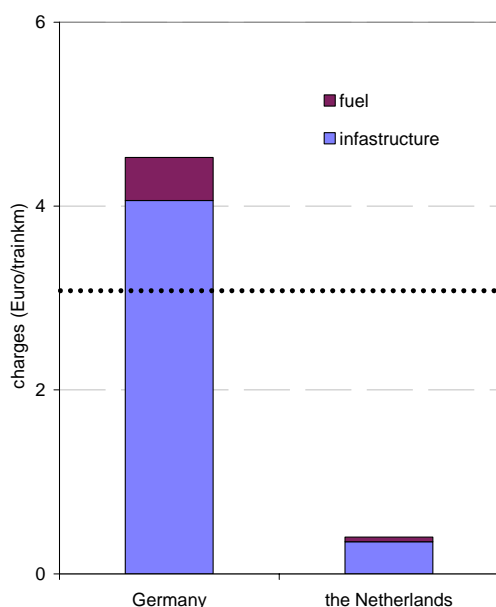
<sup>3</sup> ( ) A best case estimate is in rural areas, with low population densities and with newest technology. See TERM 2002 25 EU External costs of transport.

Several EU countries decided or have plans to introduce a distance-based variable charging system, e.g. Germany, Austria and the UK. The introduction of the charging schemes will (partially) mend the hole between the marginal external costs and the distance dependent charges. Other countries already levy (differentiated) tolls on the basis of load classes.

#### *Rail freight transport*

There are considerable differences between the charges levied on rail freight transport. This can be illustrated by the levied charges in Germany and the Netherlands (see Figure 2). Data are insufficient for assessing the development of the gap, however, as are data for the other EU Member States.

**Figure 2: Variable charges levied on rail freight transport in Germany and the Netherlands**



NB: The dotted line represents a 'best case' estimate for marginal external and infrastructure costs (MEC) for a freight train.

Source: various sources

#### *Inland shipping, sea-borne shipping and air freight transport*

There is not much information available on port dues and charges levied on the use of canals and rivers. Port dues, airport landing and take-off fees and air navigation charges can be seen as (partly) internalising external marginal infrastructure and 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. The fuel used for inland shipping, air transport and sea shipping is generally not levied. Doing so is sometimes even forbidden:

- Aircraft fuel is exempt from energy taxation in the recent proposal for an EU directive on energy taxation (European Commission, 1997). Besides, numerous bilateral air service agreements specifically forbid kerosene taxation.
- Levying of tolls on the Rhine is forbidden by the Mannheim Convention (1865).

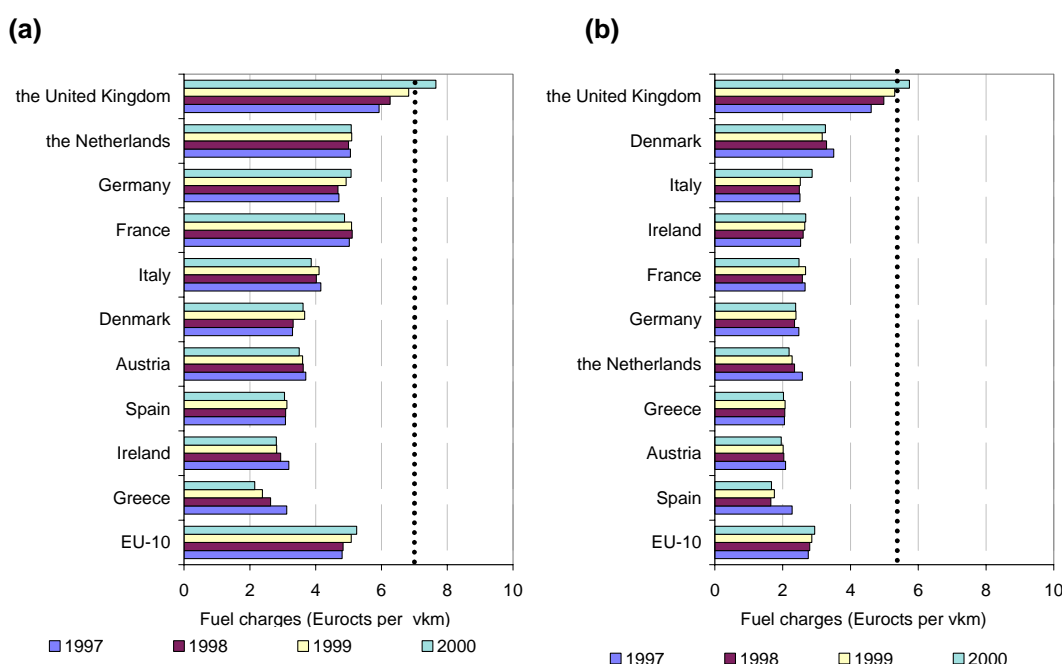
Little information is available on the legal and economic feasibility of taxation of bunker fuels for seaborne shipping. However, given the high (approx. one third) share of fuel costs in total sea vessel operating costs, fuel taxation at national or regional level is likely to cause economic distortions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

For accession countries, no information on fuel taxes or tolls is available. Therefore, the accession countries will be left out of this assessment until fuel tax data is available.

**Sub-indicator: Charge levels for passenger cars (fuel taxes)**

☺ **The gap between the marginal external costs of private car transport and the distance dependent charges (which basically consist of fuel charges) is getting smaller on EU-10 level, but mainly as a result of the strongly increased fuel taxes in the United Kingdom. Not taking the UK into account, the distance dependent charge levels for passenger cars remained constant.**

**Figure 3: Trends in fuel charges per vehicle-kilometre for (a) a petrol cars and (b) a diesel cars in ten EU Member States**



NB: The variable charges have been calculated with country specific fuel efficiencies and fuel charges. Tolls are NOT included in these figures, since no data was available. EU-10 refers to all EU-15 countries, except Belgium, Finland, Sweden, Luxembourg and Portugal for which no data were available on the development of fuel efficiency of petrol and diesel passenger cars. All Prices are in 2001 prices. Trends in some non-Eurozone Member States (Sweden and UK) may partly be explained by changes in exchange rates. The Danish crone is closely tied to the euro wherefore only minor fluctuations in exchange rate occur.

The dotted lines represent a 'best case' (lowest) estimate for marginal external and infrastructure costs (MEC) for respectively a petrol and a diesel car, see TERM 2002 25 EU External costs of transport

Source: Odyssee, 2003; Eurostat, different volumes

**Assessment**

The EU-10 average fuel charge shows an increase between 1997 and 2000, reflecting better the marginal external cost of driving a petrol or diesel car. However, the impact of the United Kingdom is considerable since UK charges have risen rapidly in this period, and a considerable amount of the total fuels sold in the EU-10 are sold in the United Kingdom. Not taking the UK into account would imply that the EU-9 average fuel charge per kilometre remained constant and would therefore on average stay below marginal external costs.

Some countries are filling up the gap between the MEC and the fuel charges e.g. Greece (petrol only) and Germany. In other countries, the gap between the MEC and the variable charges is getting bigger, e.g. Austria, Italy and Ireland. In other countries, the real charge per vehicle-km remained constant during the 1997–2000 period, e.g. the Netherlands, France and Denmark.

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 incentives to decrease these costs. Therefore, closing the gap between MEC and variable charges should

preferably be done with incentives-providing instruments such as differentiated kilometre charges.

In the absence of such advanced instruments, the UK fuel duty escalator, which was in force during the 1997–2000 period (see box 1) was a useful instrument to fill the gap between the marginal external costs and the variable charges. The UK could therefore concentrate on optimising charge structures rather than levels, whereas most other countries would have to optimise both.

We could not calculate the distance dependent charges for accession countries as a result of:

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

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## Metadata

### Technical information

1. Data sources: CE's fuel taxes database for fuel taxes and various sources for infrastructure charges
2. Description of data:

Original measure units: original in EUR per litre or EUR per km, all calculated in EUR per km of 2001.

Conversion factors applied: yes, see datasheet

3. Geographical coverage: EU-15 countries: EU-15 (Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom). EU-10 refers to all EU-15 countries, except Belgium, Finland, Sweden, Luxembourg and Portugal.
4. Temporal coverage: depends
5. Methodology and frequency of data collection: data are collected ad hoc from various sources
6. Methodology of data manipulation, including making 'early estimates': None.

#### **Quality information**

7. Strengths and weaknesses (at data level): data is very scarcely available
8. Reliability, accuracy, robustness, uncertainty (at data level):
9. Overall scoring (give 1 to 3 points: 1 = no major problem, 3 = major reservations): 3  
Relevancy: 1  
Accuracy: 3 (data on rail, 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**

Not enough data is available at the moment to make a full assessment. Data on road fuel taxes in ACs and rail fuel and infrastructure charges in the EU and AC area are necessary to improve the assessment. Therefore, a data gathering system has to be set up.

#### **Box 1: The UK Fuel duty escalator, a good practice**

The fuel duty escalator — an annual above inflation increase in the duties on road fuels which was in force between 1993 and 1999 in the UK — is primarily aimed at reducing CO<sub>2</sub> emissions from road transport and tackle climate change. As such, the escalator was the most important fiscal measure introduced by the UK Government to reduce greenhouse gas emissions. It also contributes to other transport and environment objectives, such as reducing traffic growth and congestion, improving air quality, conserving finite natural resources, and internalising transport externalities. However, a better instrument to internalise externalities (except climate change) is available by distance dependent charging.

The escalator was first introduced in 1993 at 3 % in real terms. It subsequently increased to 5 % in 1995, and since 1997 the UK Government has had an open-ended commitment to annual increases in fuel duty of at least 6 % above inflation. As a result of the escalator, the duty on unleaded petrol and diesel has more than doubled in nominal terms in the 1993-2000 period, while fuel price has also significantly increased, from 50 to about 80 pence per litre. As of 2000 the escalator was abolished.

The intention behind the fuel duty escalator was to increase the price of road fuel on a sustained basis, thereby encouraging all road users to take action to reduce their fuel consumption (leading to lower CO<sub>2</sub> emissions from road transport). The key behavioural responses to higher fuel prices by road users include:

- the purchase and use of more fuel efficient vehicles and fuel saving technologies
- the adoption of more economical driving styles
- less vehicle use (through better journey planning or cross-modal shifts)

Vehicle manufacturers are also expected to develop and introduce new fuel saving technologies, including alternative fuel and engine technologies, in response to consumer demand for more fuel-efficient vehicles.

Estimates of the carbon savings from the fuel duty escalator since its introduction in 1993 amount savings between 2 and 5 million tonnes of carbon in 2010.

*Source:* G8 environmental Forum 2000 on Domestic Best Practices Addressing Climate Change  
[http://www.env.go.jp/earth/g8\\_2000/forum/g8bp/detail/uk/uk07.html](http://www.env.go.jp/earth/g8_2000/forum/g8bp/detail/uk/uk07.html)