EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR ENERGY AND TRANSPORT

DIRECTORATE E - Inland Transport
Rail Transport and Interoperability

Brussels, 06/12/2005
FJ D(2005) D(2005)126861

NOTE TO THE FILE

Subject: Impact of increased crude oil prices on the competitive position of rail

1. Summary

Crude oil spot prices rose during the past six years from 10 to 60 US $ for a barrel[1]. Since transport is one of the most important sectors consuming oil products, this suggests a change in the relative position of transport modes. More specifically, one could assume rail was favoured as it is the only mode that does not almost exclusively rely on oil products as propulsion fuel.

Contrary to what one might expect, the present analysis comes to different conclusions for passenger and freight transport: Rail saw its overall production cost increase by less than 1% during the last five years as a consequence of higher fuel costs. The corresponding increase for its main competitor road is only 4 %. The resulting differential of 3 % (on a before/after basis) is however, too small to bring about a significant shift from road to rail. In case of freight, these differentials are so small because fuel cost contributes less than 20% to total production cost of road haulage, in case of rail even less. In addition, is that electricity prices for railways rose also in this period.

The corresponding share of fuel costs in air transport is 20%. Air and rail compete for passengers, however competition is limited to a small segment of rail passenger transport, i.e. on distances ranging from 300 to 600 km. What seems as a relative improvement for rail is often more than set off by so called low cost airlines, which have lower cost due to different production patterns[2].

[1] In nominal values. Taken real prices, the increase was even steeper.

[2] Mr O'Leary, CEO of a low cost airline, said at a lunch time training session in mid 2005 that full cost between any two points in Europe amounted to 40€ on average for a low cost airline.

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.
Office: rue Demot 28, 4/12. Telephone: direct line (32-2) 2993911. Fax: (32-2) 2990262.
Internet: http://europa.eu.int/comm/dgs/energy_transport/index_en.html

E-mail: frank.jost@cec.eu.int

2. *Approach*

The present analysis can be qualified as a before/after/analysis. It starts from the share of fuel in overall production cost of rail, road and air transport (see section 3). This share is assumed to be constant over the whole period of 1999 to 2005, i.e. other cost components having not changed or changed in the same way. In a second step, the prices of the year 2005 are set in relation to prices of the year 2000, for kerosene 2003 was chosen as a base year, by means of a before/after comparison (section 4). Finally, the increase in production cost was calculated as a product of the share of fuel cost and the fuel price increase (section 5).

This analysis involves a certain number of simplifications. It assumes that other production cost remain stable over the period, especially efficiency gains, such as from a more efficient use of fuel, are not considered. Also not considered are changes of charges or taxes during the period, such as the German toll system or changes in fuel taxation. The note also assumes diesel prices at the pump are the same for road and rail, thus not taking into account lower taxes on rail diesel as they might exist in some Member States.

3. *Importance of fuels for transport production cost*

Rail transport is the least energy intensive mode of transport : for example it needs 4 times less energy to transport a passenger by train than by car, based on actual occupancy rates. More, electricity accounts for 80 to 90% of traction in rail and energy is only a minor share of production costs for railways. For example, the cost of traction electricity accounts for 5% of Thalys production cost[3].

In the EU, oil and gas only represent 24 % in the primary energy used for producing electricity, which dampens the impact of the oil price on price of electricity used for rail traction[4].

[3] Mr. Dancoisne, CEO of Thalys at the lunch time training session in October 2005

[4] Note d'analyse sur les prix du pétrole et le secteur des transports, TREN B1

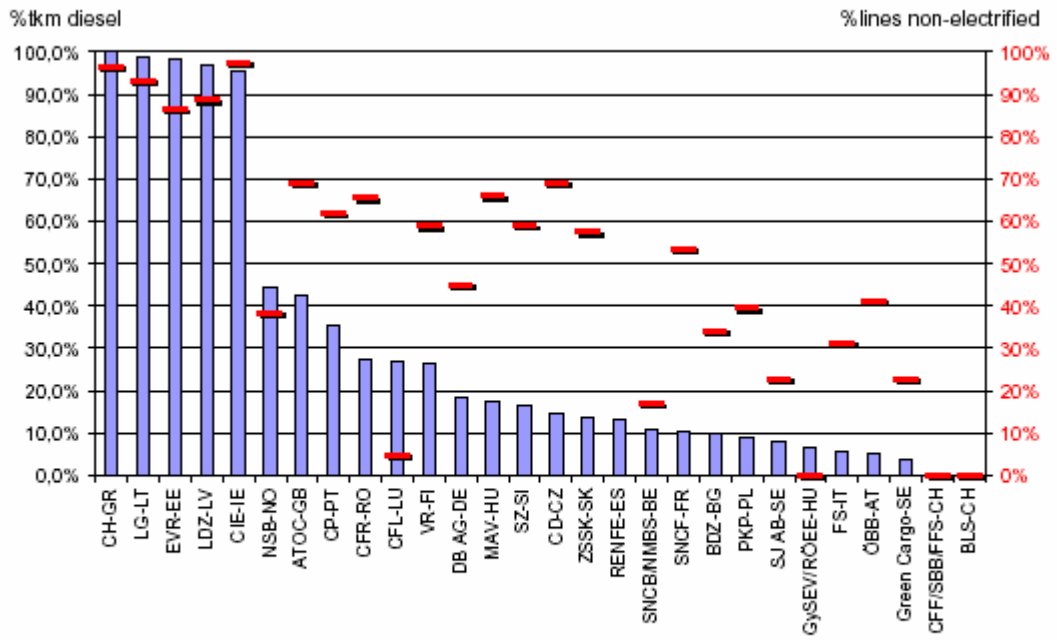


Figure 1: Share of diesel of overall operating performance in gross-tkm hauled (left axis, blue bars) & share of kilometres non-electrified (right axis, red lines)[1] (Source: UIC statistics)

It should be noted for the above figure[5] that the percentage of diesel traction is based upon the operating performance displayed in gross-tkm hauled. This unit describes the load hauled in tonnes (without the weight of a locomotive) times the kilometres. This value allows for a combination of both passenger and freight traffic in one unit, in contrast to traffic performance values like passenger-km in passenger traffic or net-tkm in freight traffic.

The graph (left scale) shows the dominant position of electric traction relative to diesel traction. The latter plays a dominant role only in Greece, Ireland and the Baltic states[6]. All these networks have no or little relevance for rail traffic between Member States. Setting them aside, one can conclude, that on average 90% of rail traction is fuelled by electricity and 10 % by diesel, as far as UIC member railways are concerned, not distinguishing freight and passenger.

Road transport

Long haul is the freight segment in which road and rail compete. Here, Diesel can be considered the only relevant fuel for trucks in Europe. Fuel accounts for 20% of long haul production cost[7]. The same share is applied for use of private car. However it is often said that private car users overweight variable relative to fixed cost, when deciding

[5] Rail Diesel Study, AEAT, Work Package 1, May 2005

[6] In case of the Baltic states, over 96% of rail freight is block trains in the hinterland to port terminals. For this type of transport, rail does not really compete with road.

[7] Bundesverband Güterkraftverkehr und Logistik (BGL), Jahresbericht 2003/2004, p. 113

on individual trips. This would involve for fuel prices a more decisive role than is their share in costs.

Air transport

Fuel is the airline industry's second largest cost factor, after labour costs, making the airlines particularly vulnerable to high energy prices. The cost for fuel (jet kerosene) typically amounts to 10-20% of an airline's total costs (with differences between low cost airlines and other companies). Since the kerosene price is set in the market, it is essentially the same for all airlines, which means that the lower the airline's overall costs are, the higher the percentage going to fuel.

4. Evolution of fuel prices

The spot price for a barrel of Brent rose from 10 US$ in January 1999[8] to 30 US $ in early 2004 to 60US $ in October 2005, with peaks of 70US$ in 2005[9]. **The diesel prices including duties and taxes in real terms rose by 20% in the six year period between January 2000 and October 2005 (see annex I).** It is assumed that diesel prices at the pump are the same for road and rail[10].

Electricity prices for rail traction rose by 16% between July of 2000 and 2005. With just a few exceptions of countries with low charges, such as Denmark, Sweden and Germany, traction electricity is charged very little in addition to VAT[11]. Rail traction is fuelled by a mix of 10% of diesel and 90% of electricity, thus fuel prices increased by 16.4%[12].

The current kerosene prices are about 100% higher than two years ago. According to the AEA (Association of European Airlines) this would translate into an increase in operating costs for their member airlines from around 12% in 2003 to 23% today. The total fuel cost for 2005 for all AEA airlines is estimated to 20 billion US dollar[13].

[8] BGL Jahresbericht 2003/2004, p. 2

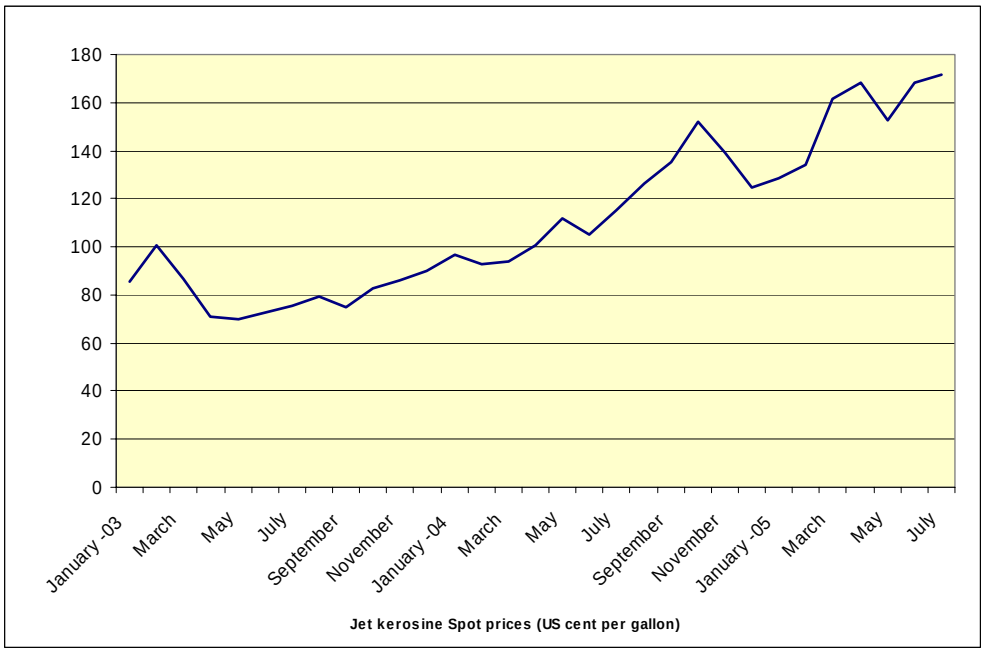
[9] Nominal values

[10] This holds for the EU's biggest consumer of diesel for rail traction, i.e. Deutsche Bahn AG, as for rail diesel Germany charges the full VAT rate in combination with excise duty. However, other Member States may have regimes which charge rail diesel lower than road diesel. Other prices differences, e.g. charges for using or access to fuelling facilities are not taken into account.

[11] See Annex II

[12] 10% * 1.2 + 90% * 1.16 = 16.4%

[13] Note d'analyse sur les prix du pétrole et le secteur des transports, TREN B1



Graph: Jet fuel prices (in US cents)

5. How does this impact on the relative production cost?

In rail transport a 16.4 % increase in cost of fuel, leads to an increase in 0.8 % in total production cost. As to road haulage a 20 % increase in diesel price combines with a 20 % share of fuel in total cost, thus increasing the latter at a rate of 4% in real terms. Air transport production cost rose by 10 to 20 % given that kerosene prices doubled and the share of fuel cost amounting to 10 to 20 %, as mentioned above. The below table summarises these results:

	Change of fuel price 2005 vs. 2000 (%) or 2003 (air)	Share of fuel in total production cost (%)	Resulting change of production cost
Rail	16.4	5	0.8
Road	20.0	20	4
Air	100.0	20	20

Contact: Frank Jost (frank.jost@cec.eu.int, phone: 00-32.2.2993911)

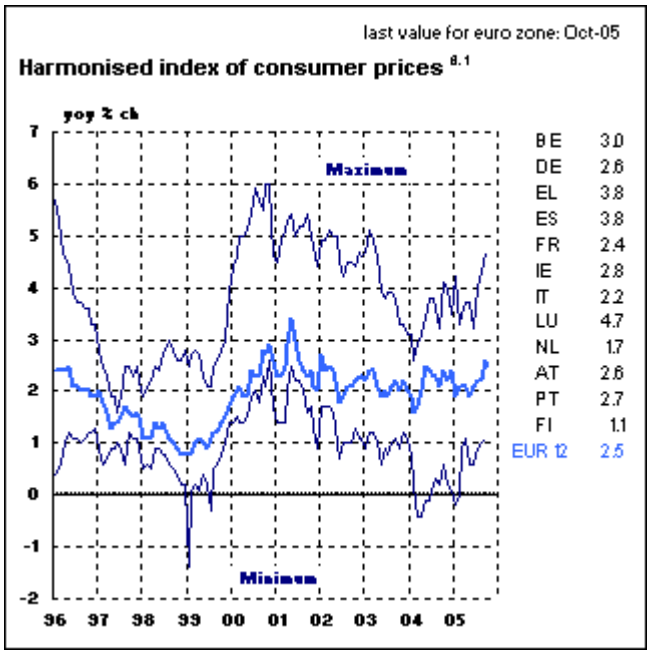
Annex I

Table: Diesel prices including taxes and duties (weighted average) of EU Member States, source: Monthly Oil bulletin

	01/2000	10/2005
	€/l	
Nominal	0.82	1.13
2005 prices (based on 2.5% inflation p.a.)	0.95	1.13

Prices increase (2000 to 2005): 20%

Source: EU Commission DG TAXUD



Absolute diesel consumption values are only available for a few railway companies in UIC statistics. Therefore estimation of consumption factors based on gross-tkm hauled are used to fill gaps in statistics, differentiated by freight and passenger locomotives and railcars. An estimated total of about 2 Mio tonnes of diesel is used yearly by the covered UIC-member railways. The sum of all diesel consumption values reported in the

questionnaire survey are nearly 1.4 Mio tonnes. This is divided between the different railway companies as shown in the below figure[14].

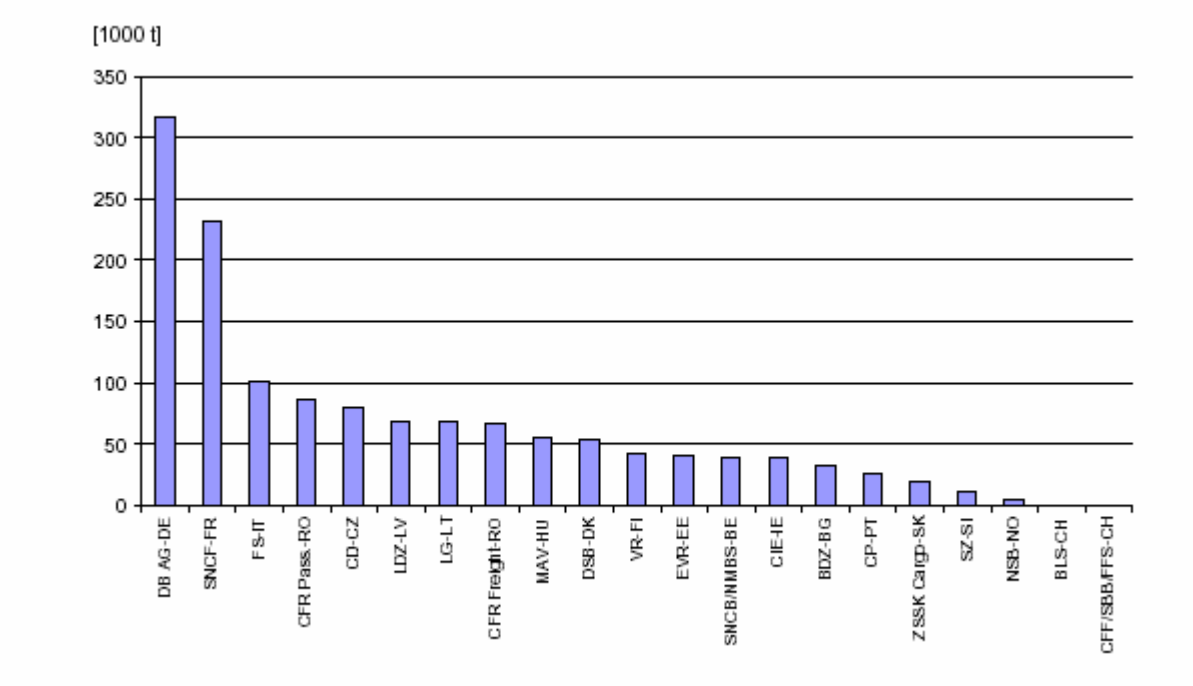


Figure: Diesel consumption in thousand tonnes of different railway companies (Source: questionnaire survey)

[14] UIC, quoted according to Rail Diesel Study, AEAT, Work Package 1, May 2005

Annex II

Bar Chart: Excise duties on electricity for business use.

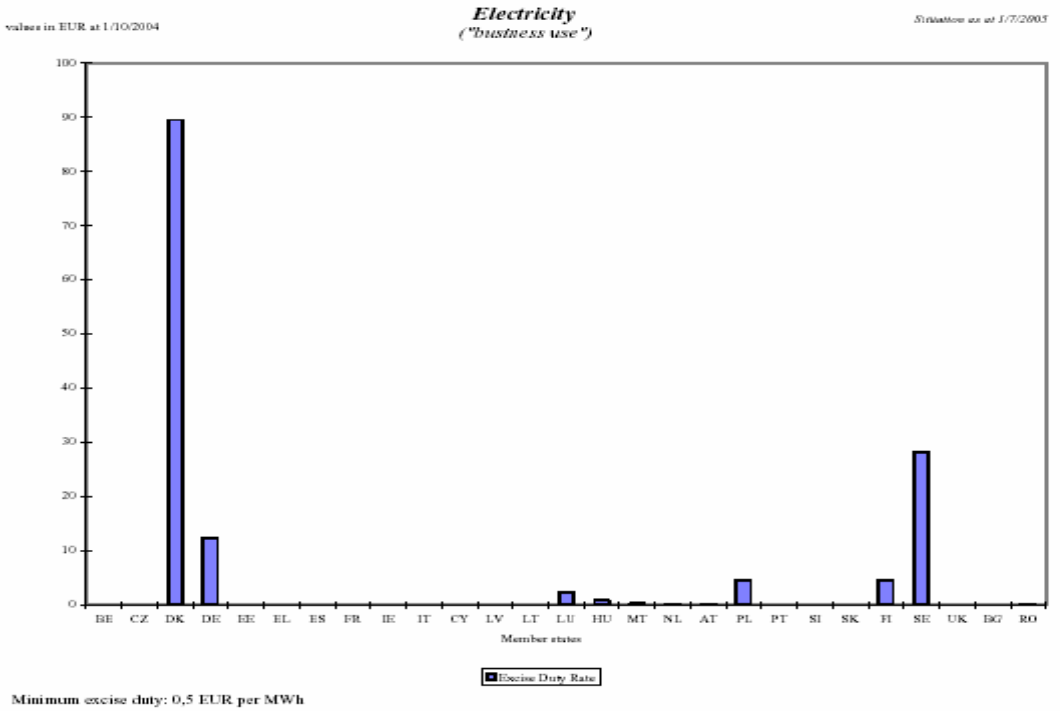


Table: Electricity Price Summary 1997-2005 [EU 15 only] [15]

1997 = 100, constant prices	July 1997	July 2000	July 2005
average (all consumers)	100	86	90
very large[16]	100	83	96
medium industrial)[17]	100	82	95
small commercial and household[18]	100	88	88

[15] Prices without taxes

[16] "Very large" implies consumption of up to 450GWh/year (maximum load 50MW). Only data for BE, DE, FR, GR, IT, NL, PT, ES, UK is included

[17] Average of 24GWh/year and 2GWh/year consumer types

[18] Average of 50MWh/year, 7.5MWh/year and 3.5MWh/year consumer types

Source: Eurostat, DTI with DG TREN analysis

The table shows that the degree of increase since 2000 has been rather more pronounced for larger customers. Small commercial and household customers have not seen the same increases. Many large users suggest further increases are likely in contracts for delivery during 2006 and future years.

Electricity prices for very large consumers rose 16% in the period July 2000 and July 2005.