

ECOTRA – ENERGY USE AND COST IN FREIGHT TRANSPORT CHAINS

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DESCRIPTION OF ACTIVITIES

The ECOTRA (Energy use and COst in freight TRAnsport chains) study aims to provide quantitative and qualitative information concerning energy use, transport intensity and costs for the transport of goods in Europe, covering the whole chain from raw materials to end users. The detailed analysis of the whole transport chain for a “basket” of typical consumer and industrial goods was used to derive estimates of total energy consumption, total volume of transport generated, and share of transport costs of total cost and final price of the goods.

Observed data and statistics were integrated by first-hand information provided by manufacturers, transport operators and retailers in order to produce and compare summary indicators across the EU: namely, total energy consumption per ton and per ton*km, transport cost per ton, transport cost per ton*km.

The study was complemented by the scrutiny of emerging trends in freight transport demand, infrastructure, logistics, technology and fuel prices in relation to their medium- to long-term implications for transport costs.

Methodology

The findings of the study are based on an in-depth analysis of the transport flows generated and required in the production and distribution processes of a sample of industries and traded products. The results are presented in terms of quantitative estimates for a set of summary indicators of transport and energy intensity and transport costs.

The analysis covers the entire supply chain of a sample of typical consumer and industrial products, and takes into account the diffusion of industrial practices in the field of supply chain management, i.e. the integrated management of both upstream (procurement of raw materials and services for production) and downstream (distribution and delivery of the finished product to the customer) processes.

Starting from a review of state-of-the-art literature, each case study was tailored to take into account first-hand knowledge of specific features of the industry/market at stake, including interviews with leading

players in concerned sectors. The study was based on a mix of bottom-up analysis with parallel cross-checking of intermediate results with the actors involved in the chains. Industrial partners, quoted at the end of the report, were the fundamental source of most of the information and their willingness to cooperate was a key factor in the success of the study.

The results of the study are reported separately for the two main areas:

- an aggregated estimate of transport costs and their part in the final price for six products traded among world macro regions, with the aim of highlighting the competitiveness of European markets and paying special attention to the cost of transport of the inland (within EU) transport leg;
- a detailed analysis of transport intensity, cost and energy use throughout the whole production and logistics chain - from raw materials to the final product at the point of retail - for nine specific products in four industries.

A scenario-based trend analysis was used to identify key drivers in possible variations of relative costs and present practices, owing to changes in transport and logistics as well as in global production and trade.

Main conclusions

The relevant conclusion of the ECOTRA study is that transport, though being perceived as a relevant cost factor, is not critical for the competitiveness of the European Union.

For overseas import and export flows, and for more or less all the commodities studied, the main component of transport cost is the maritime transport component. Pricing policies in the land transport sector within the EU will affect the overall transport cost in quite a limited way. This is also true of the supply of raw materials and components in the transport chains analysed.

The share of costs for road haulage within the EU is low for most of the raw materials (even in the case of

oil and minerals) and is higher only for high value goods (up to 23% in the case of pharmaceuticals).

Road transport takes the lion share of the distribution side of the logistic chains in the sectors under examination (rail transport is significant only for the distribution of road vehicles); however, distribution costs do not affect the competitiveness of products, instead they influence the average retail price.

Transport costs

The incidence of transport costs varies significantly among the products considered, and thus transport policies might differently affect the production sectors: where transport costs represent less than 2% or 3% of the product value, increases in transport costs may not be perceived as a major threat to competitiveness, while the impact could be different for sectors where the incidence of transport rises to 10%. It is not easy then to predict how the transport policies under discussion in the European Union (e.g. pricing policies) will affect the final prices of goods. There are several reasons for this:

- market rules determine prices by taking into account all the cost factors, and significant changes in distribution costs would induce a change in the weights of each factor causing, in turn, changes in the commercial policies of the companies;
- the economic outlook is currently characterised by record prices for raw materials (including oil), but, on the other hand, it is also conditioned by strong deflationary pressure determined by other production cost factors;
- the higher costs of transport are normally borne by truckers and experience shows that often they are not fully and easily reflected in the freight rates paid by forwarders and clients;
- the evolution of the demand for goods: the demand for more sophisticated (and expensive) goods is growing even in traditional sectors like food and agriculture; in this case the cost of transport is not a key driver.

Transport intensity

Transport intensity, undoubtedly high and implying an overall high energy consumption, should be examined separately for the upstream and downstream segments: further attention should be paid to understanding the relevance in local contexts (at a regional or district level). It is important to underline that the considerably high transport intensity is associated

with a low incidence of transport cost. In both the upstream and the downstream flows, the logistic chain structure appears to rely on low transport costs, and this is reflected by the high transport intensity. As a consequence, changes in transport supply, due to transport policies or to growing congestion, or even the increase in fuel prices, might have not trivial impacts in the structure of the industrial processes.

As a matter of fact, transport intensity is raised by two factors that have impacts at a local level:

- the intermediate suppliers' and sub-suppliers' contributions to the production process, which involves many short trips in the area surrounding production plants;
- the final delivery that, especially for consumer goods, has an impact on the congested local networks.

Energy use

Energy use is currently determined basically by the level of transport intensity and by the modal choice. The evolution towards increased transport intensity has been counterbalanced over recent decades by the increase in maritime transport (less energy consuming in terms of specific consumption), and by the technological development of the engines of road vehicles.

The expectation for the continuing renewal of the fleet according to European directives and the push towards the production and adoption of new fuels and propulsion systems (natural gas, hybrids, fuel cells etc.) enable us to foresee a decrease in specific energy use: this is the reason why, besides the expected increase in transport cost and in transport intensity, energy use is considered to become lower.

