Megatrucks versus rail freight ?

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Introduction

The rail sector has long had concerns about the greater use of megatrucks (alternatively known as 'monster-trucks', 'gigaliners', or even 'ecocombis' by their supporters) and wants to outline, with this brochure, why attempts to further liberalise their use should be opposed. In particular, the rail sector believes that allowing any wider use of megatrucks will inevitably lead to a 'domino effect' and, in time, to their general use across Europe. This would, in addition, be contrary to the Commission's own agenda for modal shift from road to rail transport, most recently set out in the 2011 Transport White Paper which stated a goal of **shifting 30% of road freight to rail and inland waterways by 2030**, as part of the long-term move to significantly reduce greenhouse gas emissions from transport.

In June 2012, European Commissioner for Transport Siim Kallas announced he was reinterpreting Directive 96/53/EC on the weights and dimensions of vehicles to permit the cross-border use of megatrucks between two member states that approve their use within their own borders. This announcement, which reversed the position the Commission had taken on this issue since the Directive was first approved, was made despite the strong opposition of MEPs on the European Parliament's Transport Committee, and from some member states. In April 2013, this interpretation was included in the proposal put forward by the Commission to revise the Directive 96/53/EC, finally allowing MEPs and member states to properly consider the proposal.

It is important to point out that the debate on cross-border circulation does not just concern 60-tonne trucks. If passed, the directive could permit the circulation of all trucks above 40 tonnes in weight and 18.75 metres in length if their member states agreed. It should also be noted that, for the first time, control of international transport will be passed from the European level down to that of member states. One of the rail sector's primary political concerns is for a level playing-field and fair competition between all modes of transport. Today, such fair competition is distorted by the lack of transparency into the societal costs of each transport mode, such as pollution, noise, congestion or accidents.

It is not the intention of the rail sector to 'blame' the road sector for trying to improve its efficiency. However, any attempts to liberalise current restrictions on use could have major implications that would be contrary to wider EU goals. The rail sector believes that the European Commission, the European Parliament, and member states should not look at this issue in a simplistic and short-term way, but take into account the dynamic effects of megatrucks and their impact on the transport system as a whole.

The legislative framework and national experiences

According to European law (Directive 96/53/EC), for international traffic crossing European borders vehicles cannot be longer than 18.75 metres and/or more than 40 tonnes in weight (or 44 tonnes if it is part of a combined transport journey). For journeys solely within their own national territory, member states are entitled to set their own national requirements and allow the use of megatrucks which may be longer and heavier than the European norms. Until 2012, it was accepted that Directive 96/53 prohibited all cross-border use of megatrucks. However, in June 2012, European Commissioner for Transport Siim Kallas confirmed that he was reinterpreting the text in a way that would allow cross-border use of megatrucks between two member states if both of them authorised the use of such vehicles within their own borders.

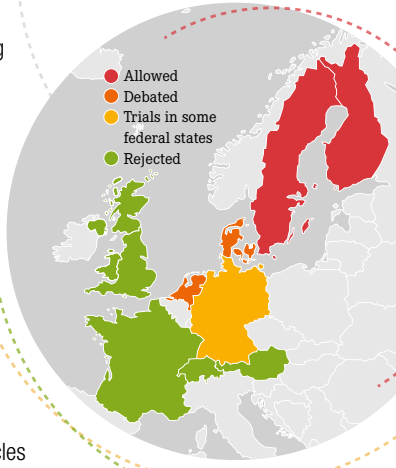
Due to specific conditions they face (long distances, low population density, and limited infrastructure), **Sweden and Finland were the first European countries to approve the use of megatrucks within their borders**.

However, there has been increasing pressure from parts of the road haulage sector in other European countries to allow the use of such vehicles as well. As a result, some countries with totally different geographic characteristics to Sweden and Finland have also introduced this option:

- In November 2007, **the Netherlands** agreed to allow longer vehicles with a weight of up to 50 tonnes as part of a so-called 'experience phase'. The Dutch road haulage companies lobbied the government to have the weight limit increased, and since May 2008, megatrucks up to 60 tonnes in weight have been allowed on Dutch roads;
- The use of megatrucks in **Denmark** began in 2008. Originally it was limited to a three-year trial period but in September 2010, the Danish government announced that it was prolonging the trial so that megatrucks up to 25 metres long and 60 tonnes in weight could be used until at least 2017;
- Following the 2009 federal elections, the **German government** actively pushed for a nationwide trial of megatrucks. A majority of the 16 Länder (federal states) decided against taking part in any trial. However, the federal government insisted the so-called 'field test' should begin in 2012. The failure to involve the Länder and the federal parliament in the decision led to the issuing of a constitutional challenge, with a decision yet pending.

In addition, in Sweden, a new trial began in 2011 to test the use of 'extra-long' megatrucks – up to 32.5 metres in length, 80 tonnes in weight, and with a volume of 200 m^3 – the longest road vehicles yet to be used in Europe.

The use of megatrucks in Europe: current situation



Other countries have come out firmly against the use of longer and heavier trucks. In 2008, **the UK Department for Transport** rejected a proposal to introduce them on British roads, following the publication of an independent report. Plans to introduce them in **France** in 2009-2010 were dropped after widespread opposition, and countries including **Austria** and **Switzerland** have been steadfast in their opposition to them.

The single real argument in favour of megatrucks: capacity increase for road transport

Transport stakeholders and public authorities do not share unanimous views on whether megatrucks offer advantages or disadvantages. Some road-sector stakeholders – in particular truck manufacturers and large hauliers – readily point to the advantages made possible by megatrucks, whenever and wherever they are allowed to operate. All of these arguments come down to one key point, capacity increase, which they argue would offer a number of advantages.

They rest their case in particular on:

- Increased transport capacities (payloads) made available for a minimal extra financial outlay;
- The same freight volumes being moved using fewer road vehicles (asserting that each megatruck offers up to 50% more extra payload capacity), hence a reduction or stabilisation of the number of conventional trucks on the roads, based on the unlikely assumption of constant traffic levels and the absence of modal shift towards the road sector;
- A more rational use of road and motorway capacities;
- Road unit costs (cost per tonne-kilometre) reduced (by 20-25% over long-haul runs, according to a TIM Consult survey). This, however, would only be true if these outsized trucks were to always carry their maximum load.

However, **increasing capacity is not the only way to improve the operating efficiency of trucks**. In Switzerland, the Heavy Vehicle Fee was introduced in 2001, which sought to internalise the external costs of road freight and shift more freight onto rail. The calculation of the fee in line with the maximum authorised weight according to the vehicle licence, the kilometres travelled, and the emissions generated has encouraged road freight traffic to operate more efficiently, using vehicles to the fullest capacity and leading to a decrease in the number of empty trips.

Consequences:
a higher modal share for road

Supporters of megatrucks claim that two megatrucks could transport the volume of goods that currently requires three standard trucks. This would then mean that there would be fewer trucks on the road, resulting in benefits for CO_2 emissions, congestion and road safety. But this is a simplistic and short-term way of looking at it; what also should be taken into account are the medium to long-term effects. It is beyond question that allowing cross-border circulation of megatrucks would result in higher productivity and thereby in better efficiency for road hauliers. Yet another consequence of this would be to trigger a dynamic process whereby **significant volumes of freight would be shifted back from rail and inland waterways (IWW) to road**.

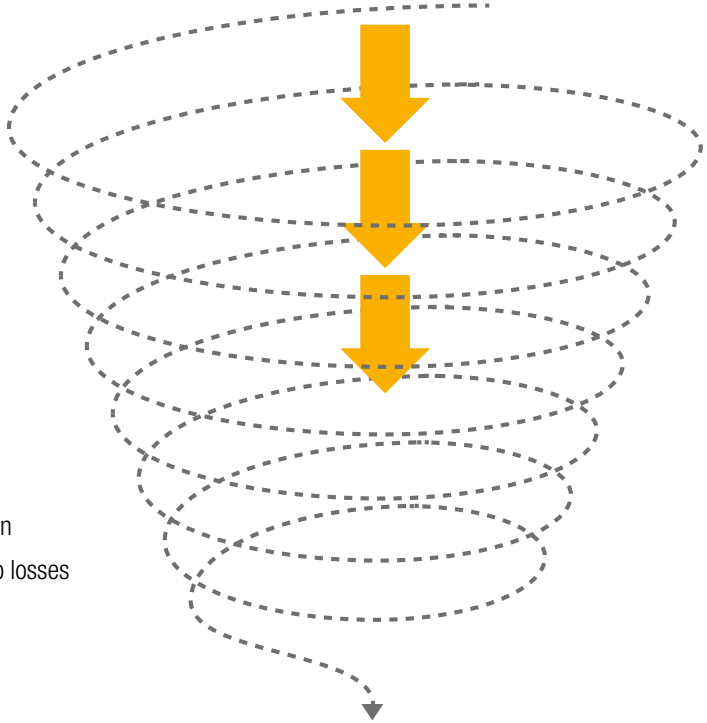
Some supporters of megatrucks do not share the belief of the rail sector that greater use of megatrucks would jeopardise rail and IWW market share. They argue that road and rail/IWW do not transport the same type of goods: rail traditionally transports low-value goods over long distances, while road transports higher-value goods over shorter distances. However, this claim is incorrect: rail companies nowadays transport all kinds of goods, not just bulk goods, with everything fitting into a container being ready for rail. Furthermore, greater use of megatrucks will make road transport more competitive in those medium and long-distance markets that are most suitable for the rail sector, leading to 'reverse modal shift'.

A 2011 study carried out by K+P Transport Consultants and the Fraunhofer Institute for Systems and Innovation Research (ISI) examined the effect that the widespread use of megatrucks would have on five trans-European corridors. It concluded that **single wagonload rail freight** would be affected worst, due to its high share of fixed costs, with up to **35% of rail freight shifting back to road**. Furthermore, the intensity of the 'downward spiral' in some of the single wagonload markets could probably lead to their partial or total abandonment by rail freight operators in some regions or countries.

The same study concluded that **combined rail-road transport** would lose significant market share as well, with up to **13% of rail freight shifting back to road**.

The ‘downward spiral’ effect of megatrucks on rail freight

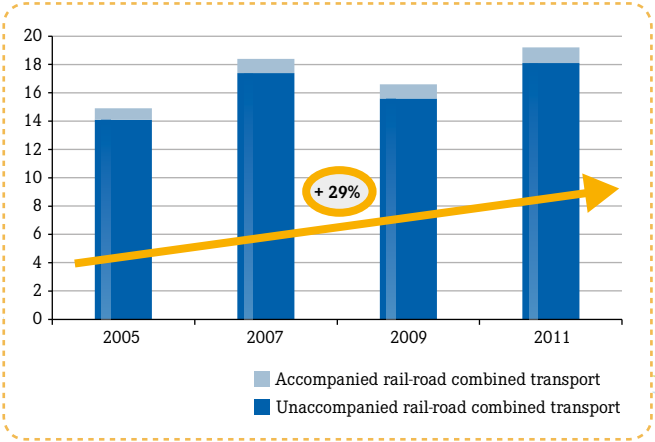
- Approval of megatrucks: reduction of production costs for the road transport industry
- Traffic losses for rail freight
- Lower utilisation of production resources
- Lower utilisation of infrastructure capacity
- Increase in production costs and deterioration of the service provision
- Deterioration of rail’s position in intermodal competition
- Considerable transport reallocation, combined with job losses and closure of rail freight access points and sidings



Combined transport is certainly the most growing and promising segment among the existing rail freight products. Volumes transported by rail-road combined transport have consistently increased over the past years, with a growth rate of nearly 29% between 2005 and 2011. The total European combined rail-road traffic is set to increase further in the coming years, but the emergence of megatrucks could put this development at risk, as demonstrated by the above-mentioned study.

These consequences would clearly be inconsistent with the aims of the 2011 Transport White Paper to achieve modal shift of 30% of medium and long-distance freight by 2030 from road to rail and inland waterways, and to reduce CO_2 emissions from transport by 60% by 2050. They would also undermine the serious investment made in programmes that have been designed to shift freight from roads to more environmentally friendly means, in particular the Marco Polo programmes (2003-2006 and 2007-2013) which had a total budget of €500 million.

Volumes transported via rail-road combined transport (in millions of TEU), 2005-2011



Source: KombiConsult, *UIC combined transport report 2012*

Consequences:

the effects on CO_2 emissions

The environmental benefits of carrying freight on rail are widely accepted. As well as the economies of scale of energy use that come with transporting freight by rail, there is the significant benefit of being able to use electricity as a power source, which is increasingly being generated by low or zero carbon energy sources. Already today a shift from road to rail reduces the carbon dioxide (CO_2) emissions dramatically. Furthermore in 2010, the European railways agreed to set a target of reducing the specific average CO_2 emissions (measured per passenger-km or tonne-km) from train operations by 50% by 2030 compared to 1990, while by 2050 they would strive to have completely carbon-free train operation.

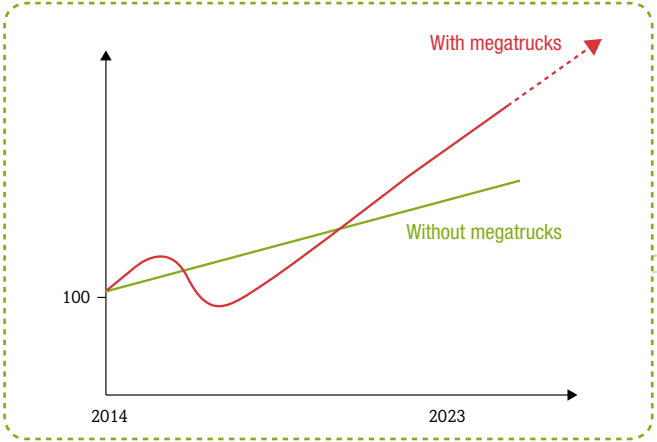
In 2011, the European Commission adopted, for the first time, specific targets for reducing greenhouse gas (GHG) emissions from transport, the vast majority of which are caused by CO_2. These envisage **reducing GHG emissions by 20% from 2008 levels by 2030, and by at least 60% from 1990 levels by 2050**. This will be a major challenge given that GHG emissions have risen in the EU transport sector by over 30% since 1990.

Heavy-Duty Vehicles (trucks and buses) represent about one-quarter of EU road transport's CO_2 emissions and some 6% of total EU emissions. Unlike rail or car use, there is no foreseeable scenario under which trucks will travel purely on electric energy. Reductions in CO_2 emissions will have to come through improved vehicle efficiency, cleaner energy use (such as biofuels), and more efficient fleet utilisation. A shift of freight from rail to road will therefore have clear negative consequences for the environment.

One argument put forward for the use of megatrucks is that there will be a reduction in emissions due to fewer overall truck movements. A study carried out by the German Fraunhofer Institute for Systems and Innovation Research (ISI) in 2009 produced the first sound evidence that introducing longer and heavier vehicles (LHVs) would be harmful for the environment. In contrast to earlier studies, Fraunhofer used a dynamic approach that went beyond field studies that are limited to small areas. The authors of the study came to the conclusion that megatrucks have the potential to reduce greenhouse gas and air pollutants, but only in the short term. When the modal shift to roads is taken into account, any savings in CO_2 emissions will soon be more than cancelled out, resulting in a negative impact on the climate.

The graph below clearly shows that, while megatrucks may offer benefits when it comes to CO_2 emissions in the short term, **these benefits disappear in the medium to long term, as the modal shift from rail to road becomes increasingly apparent**.

Absolute CO_2 emissions in transport



Source: Fraunhofer 2008

Consequences: the costs of infrastructure enhancement

The introduction of longer and heavier trucks would weigh heavily on existing road infrastructure in Europe, which has not been constructed for vehicle loads of up to 60 tonnes or more.

The costs of accidents, necessary infrastructure adaptions and negative impacts on the climate resulting from the broader use of megatrucks will be shifted onto the taxpayers, while only a small number of road transport companies will benefit from it. The improvements in the existing infrastructure that would be necessary to run megatrucks across Europe include:

- Reconstructing infrastructure to cope with different, more costly weight specifications and vehicle dimensions;
- Improving safety requirements for tunnels to cope with the extra volume of megatrucks;
- Widening roundabouts and access lanes;
- Upgrading level crossings at road/rail interfaces (design, dimensions, safety equipment, timings, clearance distances), and new road-over-rail bridges where necessary;
- Enlarging parking areas to cope with megatrucks;
- Restructuring freight terminals and logistics platforms on the outskirts of population centres.

In Germany alone, the upgrade of bridges on major highways would amount to up to €8 billion according to the German Highway Research Institute BASt, and an additional 20 000 parking spaces would be needed (each megatruck uses two normal parking spaces, thereby exacerbating the problem). Likewise, in Austria, the estimated costs of adapting roads to the requirements of megatrucks would amount to €5.4 billion, according to the Austrian motorway manager ASFINAG.

According to consulting engineers Borlini & Zanini, who examined the impact of longer and heavier vehicles (LHVs) on the Swiss road infrastructure, an additional 1.5 billion Swiss francs per year over 15 years for road maintenance and extension would be required if megatrucks are allowed in Switzerland.

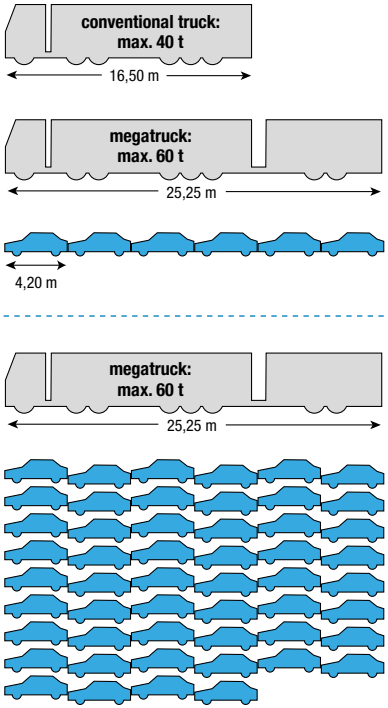
Consequences: a negative impact on transport safety

Introducing megatrucks onto the already congested road and motorway networks in Europe would seriously increase the risk of fatal accidents, particularly if they were allowed in the main economic and urban centres. The impact energy released when a 60-tonne LHV is involved in a collision is considerably greater than with a conventional vehicle weighing a total of 40 tonnes. One particular problem on motorways is how to protect oncoming traffic from accidents involving LHVs.

Independent studies have concluded that megatrucks will lead to greater accident risks:

- Overtaking and clearing road junctions and railway crossings will take longer;
- Higher gross vehicle weight will have a negative impact on the **severity of accidents**. Current crash barriers were not designed for heavier vehicles or for the impact of articulated vehicles;
- The **risk is especially high for vulnerable road users** with a high speed and weight differential (e.g. motorbikes);
- There is an increased risk of driver failure, due to sensitivity to cross winds when moving, handling difficulties (even with specific assistance systems), braking distances, and visibility problems. Additional training would need to be given to drivers and the **technical standards of the vehicles would need to be upgraded**;
- An **increasing number of accident casualties** are to be expected for most of the types of megatrucks that were researched in a study conducted by the independent Transport Research Laboratory (TRL) in the UK.

Introducing megatrucks onto congested road and motorway networks (particularly in major production and consumer areas, port regions, etc.) poses new types of risks in terms of road safety

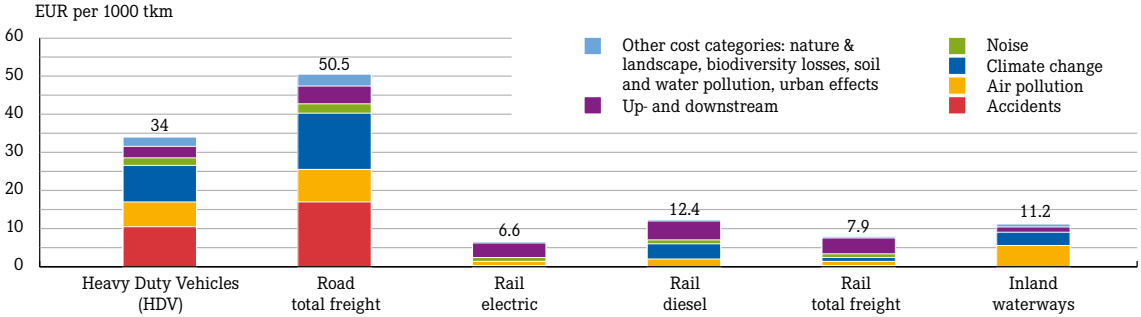


Consequences: the true costs of transport increase even more

In many calculations presented today, the real costs of freight traffic often remain hidden. This is because the external costs of road transport are often ignored: these are the true costs incurred by transport, which are not supported and paid for by individual transport users but are borne by society as a whole. There are many external costs as a result of transport activity – the major ones include **climate change impact, air pollution, accident costs, congestion, and noise along with smaller but not insignificant issues such as ecosystem loss, soil and water pollution, and biodiversity loss**. A study by a team of established consultants (CE Delft, INFRAS, and Fraunhofer ISI) estimated the total external costs of transport for the 27 European countries it considered at €510 billion excluding congestion, or €660 - €760 billion if congestion is included. The study also found that **road sector users generate 93% of transport's total external costs between them**.

The results of the study also indicated the average costs for each transport mode (total costs divided by traffic volumes) that allowed for a modal comparison and a calculation of the costs that could be avoided by means of shifting from one mode to another one with less external impact. As shown in the chart below, **the average external costs for road transport are more than four times higher than rail for freight, and more than six times higher for passenger services (excluding congestion).**

Average external costs for freight transport (excluding congestion) in 27 European countries[1], 2008



Source: CER & UIC, Greening transport: reduce external costs, April 2012

[1] EU-27 minus Cyprus and Malta, which do not have a railway system, plus Switzerland and Norway

A study conducted by Oxera for the UK market in May 2007 came to similar conclusions, that the increase in external costs caused when freight ceases to use rail and is moved by megatrucks instead, more than offsets any benefits that come through using megatrucks instead of normal trucks (see below).

At first sight the move from HGVs (normal trucks) to LHVs (megatrucks) seems to reduce external costs, but the benefits of this move would be outweighed by the lack of sustainable transportation when ceasing to use rail. **The additional road freight movement generated by megatrucks would cost over £900 million (or €1050 million) - a cost not be covered by freight forwarders, but by taxpayers.**

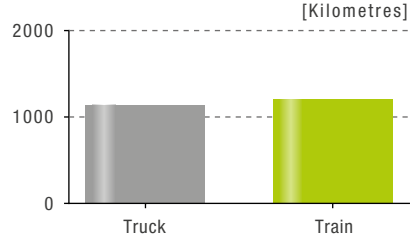
Impact of longer and heavier vehicles (LHVs) on the external costs of UK freight transport

CHANGE	COST (in million £)
Switch from HGVs to LHVs	-44
Switch from rail to road	+71
Road freight generation	+907
Net overall impact of LHVs	+934

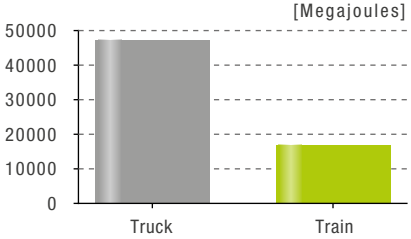
Source: Oxera The Road, Rail and External Impact of LHV's, May 2007.

Comparison of the environmental impact of freight transported by rail and road on the Rotterdam-Genoa corridor

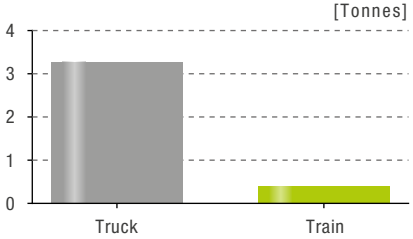
Distances
Distances for each transport mode



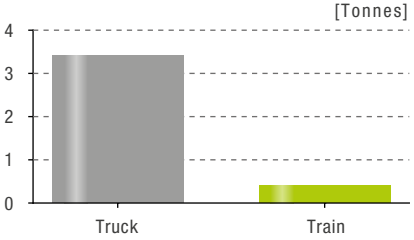
Primary energy consumption
Energy resource consumption



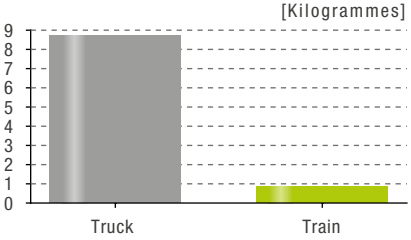
Carbon dioxide
Greenhouse gas, climate changes



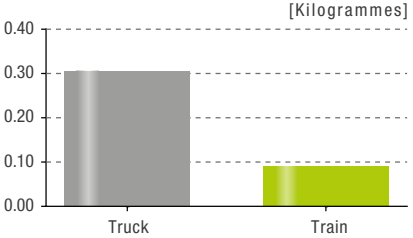
CO_2-equivalents
Climate changes



Nitrogen oxides
Acidification, overfertilization, smog



Particulate matter
Combustion related



Source: Ecotransit, 2013

Public opinion

In recognition of the importance of external costs of transport and the need to reduce CO_2 from transport in particular, the European Commission acknowledged in its 2011 Transport White Paper the necessity to shift freight transport from road to more sustainable modes of transport, such as rail and waterborne inland transport.

Megatrucks are unpopular with the wider public: in country after country, citizens have clearly indicated that they do not want to see longer and heavier trucks on the roads.

Belgium

February 2012, poll carried out by the Belgian research institute iVOX on behalf of the mobility organisation Komimo and the environmental groups BBL, IEW and Greenpeace:

- 88% of the public is against the general introduction of megatrucks;
- 79% think that the quality of road surfaces will deteriorate with the introduction of megatrucks;
- 70% are convinced that megatrucks are bad for road safety.

Austria

September 2013, survey by the Austrian car user and bicyclists club ARBÖ:

- 94% of respondents reject oversized trucks on Austrian roads. Costs for the taxpayers and safety concerns are the two most important reasons for rejecting megatrucks.

Poland

October 2011, Inquiry Market Research conducted a survey on behalf of the campaign Tiry na tory ('Move trucks to trains'):

- **69%** of respondents reject the admission of 25-metre long, 60-tonne trucks. **14%** are in favour;
- Car owners and car-free people agree in their rejection of megatrucks.

Germany

March 2011, poll commissioned by the Association of German Transport Companies (VDV) and the Pro-Rail Alliance (Allianz pro Schiene):

- **77%** of the public were against permitting megatrucks (**4%** more than 2007);
- **67%** were also against trials with megatrucks on public roads;
- **69%** said the most important reason for rejecting megatrucks was the vehicles would be a greater accident risk for other traffic users because of their size and weight;
- The second most important reason for rejecting megatrucks (**66%**) was that substantial infrastructure costs to the taxpayer would arise because permitting megatrucks would mean having to upgrade parts of the road network;
- Almost as important (**65%**) is the fact that megatrucks would lead to freight transport being shifted from the railways onto the roads, which would be damaging to the environment.

France

June 2009, poll carried out by CSA on behalf of the environmental group France Nature Environnement (FNE):

- **81%** of French people reject the introduction of megatrucks;
- **79%** are worried about traffic safety in the event that megatrucks are allowed.

Switzerland

November 2009, survey carried out by the LINK Institut:

- **80%** of respondents reject the introduction of megatrucks in Switzerland;
- **71%** of respondents believe that megatrucks pose a real danger to all other road users;
- **77%** believe that the introduction of megatrucks would considerably increase the cost of road maintenance in Switzerland.

Great Britain

August 2007, survey conducted by market research organisation GfK NOP commissioned by the organisation Freight on Rail:

- **75%** of the public do not support allowing megatrucks onto British roads;
- **80%** of the public want to see more freight on the railways and would be in favour of government action to encourage this.

Rail alternatives

The 2011 EU Transport White Paper set out ambitious goals for European rail freight, proposing that 30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050. Meeting these goals will be challenging, not least due to the levels of historic under-investment in rail. However, European legislators are supporting modal shift. Measures promoting this include:

- The creation of a priority freight network for Europe (TEN-T);
- The development of rail freight corridors, and capacity improvements;
- The implementation of ERTMS[2], the European Rail Traffic Management System;
- The use of advanced wagon-fleet management in Europe;
- Harmonisation in freight telematics by implementing European technical specifications for interoperability in freight telematics (TAF TSI);
- Further projects related to optimisation of efficiency and quality in international rail freight business, such as the 'Marathon' project[3].

In addition to the initiatives currently being promoted by the Commission, the European rail sector is engaged in SHIFT²RAIL[4], the European initiative to seek focused Research and Innovation (R&I) and market-driven solutions by accelerating the integration of new and advanced technologies into innovative rail product solutions.

One of the innovation programmes being developed in SHIFT²RAIL aims at developing technologies for sustainable and attractive European rail freight that will help further realise the Commission's aforementioned targets with regard to freight transport.
In practical terms, the objective of the SHIFT²RAIL innovation programme is to develop the high-performing freight train system of the future, with an improved environmental profile.

[2] http://www.ertms.net

[3] http://www.marathon-project.eu

[4] http://www.shift2rail.org

Conclusions

European society is facing the challenge of reducing the environmental impact of freight transport against a background of seeking to meet demand for it and stimulate the economy. Megatrucks may at first seem like part of the solution in this respect, but they are not: as this document shows, taking this path produces negative consequences that outweigh any wider benefits.

While some operators are keen to take advantage of them, claiming that they will reduce truck journeys, the economic attractiveness of megatrucks on the micro-level would encourage their further use. Instead of reducing road transport, the total number of truck journeys would continue rising. Their use will demand significant infrastructure improvements, and they will meet no climate goals, however unambitious. More significantly, their wider use would negatively impact and significantly undermine a more suitable and sustainable mode of transport: rail.

The organisations that have produced this document suggest instead alternative actions to tackle the demand for freight transportation in the immediate future:

- Provide EU co-funding to top up funds from national and regional authorities for the building and maintenance of rail infrastructure, via Structural Funds, the Connecting Europe Facility and Horizon 2020;
- Ensure that funds collected through road tolls are spent (at least partially) on the development of environmentally friendly transport alternatives;
- Allow and encourage national programmes to support the development and maintenance of rail connections to the main rail network on industrial sites ('private sidings');
- Ensure alignment between road and rail infrastructure charges for freight;
- Fully internalise external costs in all modes by applying the polluter pays principle, and making the current voluntary provisions in the 'Eurovignette' Directive mandatory at a national level;
- Harmonise technical requirements between modes, to ensure cross-modal compatibility;
- Promote harmonised working and social condition between transport modes, and effective monitoring of their application by all transport operators.

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