



Institut du développement durable  
et des relations internationales



Centre for European  
Policy Studies



Fondazione Eni Enrico Mattei

**European Dialogue on the Energy & Climate Challenge  
IDDDRI/CEPS/FEEM  
Second meeting, Warsaw, 23 & 24 June 2010**

**Background Paper on challenges to revitalize rail transport  
Session 3, Warsaw, 24 June 2010**

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The purpose of this non technical paper is to address possible EU actions and instruments to (re)vitalize the development and use of low carbon rail freight and passenger transport, in particular in the new Member States, with the view to contributing to the achievement of long term ambitious GHG emission reduction targets (assuming at least -80% reduction economy wide by 2050 as compared to 1990 levels).

This paper builds upon and follow up the discussion held at the first European Dialogue (Madrid, 12 and 13 April 2010), where participants recognized the need to design a long term integrated EU strategy aimed at curbing down transport growth rates, decoupling GDP growth from GHG emissions, and achieving the decarbonisation of the transport sector, in particular through the electrification of road transport.

The second Dialogue meeting focuses on rail transport which is, together with inland navigation, one of the lowest carbon emitting transport modes (I).

For that particular reason and many others, rail transport should be (re)vitalized in the EU<sup>1</sup>. Despite the progressive liberalization of the rail transport sector, its market volume has remained stable since 1996, but its relative share is decreasing as compared to aviation and road which shares have increased significantly. Within the Internal Market, rail transport must become more competitive while improving its energy efficiency from both a technological and operational viewpoint. Pricing and fiscal instruments that can ensure full internalisation of external costs by all transport modes appear to be the most promising option to level the playing field between them towards low carbon business models (II).

Getting the price right will create innovation and facilitate technological improvements. Combined with a more efficient use of railways and systems (interoperability), it can improve carbon intensity of rail transport both for passenger and freight. It seems that modal shift from the more polluting modes (aviation and road) to electric rail modes combined with a management of mobility demand and an enhanced co-mobility amongst all modes is an important policy option that can achieve emission reductions. However, this will require massive investments to be directed towards appropriate infrastructures and services. The EU can play an important role to improve co-modality in designing a fully integrated Trans-European Network for Transport (TEN-T) which can influence spatial planning policy in the EU Member States (III).

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<sup>1</sup> Railway revitalization is not a new issue. It is one of the key objectives of 2001 White Paper on Transport Policy which set ambitious objectives by 2020: to increase its market share of passenger traffic from 6 to 10 % and of goods traffic from 8 to 15 %. The 2001 White Paper identified three main methods of railways revitalization: a) integrating rail transport into the Internal Market b) making optimum use of infrastructure c) modernization of services.

## **I. Facts and figures on rail transport within the EU and related GHG impacts:**

Nowadays, the transport sector emits almost a quarter of all GHG emissions, whereas GHG emissions from freight and passenger rail transport accounts for less than 1% of transport GHG emissions, which mainly result from the use of diesel or electricity produced from fossil fuels (80% of railways are electrified). Looking at BAU projections in the EU 27, CO<sub>2</sub> emissions from freight and passenger rail transport should decrease, from 29 million tons in 1990 to 20 million tons, in 2050. In contrast, CO<sub>2</sub> emissions from road transport were of an amount of 695 million tons in 1990 but they are expected to increase up to 1018 million tons by 2050 (source: JRC 2008, "Backcasting approach for sustainable mobility").

Freight transport continues to grow faster than the economy (source EEA: TERM 2009), but road and aviation freight transport show the largest increase. If the modal split between road and rail freight stayed constant over the last decade in the EU 15, the road's freight transport market share has strongly increased in the EU 12 (more than +50%), mainly because of a change in the geographic orientation of the markets for the new Member States (and the development of road freight transport services at low costs).

Passenger transport continues to grow, in particular by car, though slower than the economy and with some variations between Member States (including some decrease in 2007 in Austria, France, the Netherlands, Spain and the UK). During the last ten years (1997–2007), demand for rail remained fairly steady in all EU-15 but one (Portugal). However, for the EU-12, rail transport declined considerably in most countries, with the notable exception of three countries (Estonia, Hungary and Slovenia) which have experienced a slight improvement in rail demand since 1997. Lithuania, however, did not increase its rail use to 2006, reaching a record low of 11 % of the 1990 level (source: EEA TERM 2009). Overall, it is worth noting that the economic recession does not seem to have affected the rail passenger transport.

## **II. Enhance sustainable competitiveness of rail transport and level the playing field between the various transport modes:**

### A/ Towards a competitive and carbon efficient EU rail sector:

a) EU approach to liberalization of freight and passenger services: a meaningful strategy to achieve a level playing field?

The opening of the transport market is one of the main objectives of the Common Transport Policy and a key element of the rail revitalization strategy through the adoption of 3 "railway packages"<sup>2</sup>. Whereas freight and international passenger transport are fully liberalized, there is to date no obligation to open national passenger's transport systems, and the situation differs widely according to countries. The EU case for reform encompasses following arguments: optimal cross border services, quality and service differentiation, quality improvements, larger scale of cost recovery, better response to consumers, a decrease of rent seeking, and an increase of overall rail efficiency. Liberalization would contribute to eliminate asymmetries with other transport modes by increasing rail services quality and related attractiveness. Increased efficiency is also supposed to lead to a reduction of inefficiencies, innovation in management, the establishment of outsourcing strategies, elimination of redundancies, eventually leading to a relative rebalancing of prices between transport systems.

Still the question arises to know if liberalization is relevant to all transport services markets. Railway services are characterized by their multi-products nature. It encompasses passenger and freight services which both entail specific services and different degree of substitutability or complementarity with other transport modes:

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<sup>2</sup> - The "First package" (directives 2001/12/EC, 2001/13/EC/ 21001/14/EC) entered into force in 15 March 2003 aims at liberalizing rail freight through the introduction of open access on the Trans-European railway network, representing 50% of EU networks and 80% of traffic.

- Third party access was generalized to the whole network with the "Second package". It also introduces harmonization of safety requirements and certifications, and the creation of the European Railway Agency for safety and Interoperability.

- The "Third package" tackles liberalization of passenger transport. Directive 2007/58/EC establishes the liberalization of international passenger transport, as from January 2010. There is however no obligation as regards the openness of national passengers' transport system.

- In Bulk transport services, intra-modal competition need to rely on proper business plans to be competitive with road systems. Further complementarity should be encouraged. In the area of small volumes and parcels, flexibility and tailor made solutions, as well as just-in-time strategies are important competitive requirement to constitute a credible substitute for other transport modes.
- In the passenger domain, long distance can be distinguished from short distances services. A degree of substitutability is envisaged in long distance services (air/ road). Some degree of intra-modal competition may be possible, depending on the scale and density of the market. Indeed, railway services are subject to density effects, i.e. the unit costs of rail services would decline as output increases. This will impact the shape of the market as costs may be recouped on the basis of large traffic volumes or long routes. The market size will thus be an important determinant, and eventually influence the degree of possible competition on the markets, which may likely be restricted to a small number of players. On short distances (urban and regional services) a better complementarity with other transport modes could be developed where intra-modal competition may even be counter-productive.

The approach of rail liberalization pursued by the EU allows to take these specificities into account and to establish different arrangements according to the nature of the market segment (competition FOR the market v. competition ON the market). EU legislation also establishes exemptions to intra-modal competition to introduce the possibility to deliver Public Services Obligations contracts to ensure that the less profitable routes or services will be delivered.

How to develop an effective intra-modal competition? The liberalization paradigm struggles with a certain complexity of the railway system. First, increased efficiency of international railway systems rely on the removal of legal and technical barriers. Railway packages are particularly dedicated to these aspects. EU legislations endeavor to tackle such barriers at their very core by introducing interoperability requirements (in particular through the European Railway Agency) and make rail more attractive so as to compete with other transport modes. It would also contribute to improve cost efficiency of rail systems as it is estimated that savings for a high degree of technical harmonization amount 30-40% of chain costs (equipment, operation, maintenance) (UNIFE 2000).

Second, railway infrastructure can be considered as essential facility given the very important development costs they imply (estimated between 6 and 10 M€ for 1km of track, according to countries and topographical conditions). Benchmarking infrastructure costs (INFRACOST Study 2001) show that average renewal and maintenance costs are higher in Europe than in other part of the world due to the double nature of transport services performed on the networks leading to higher technical requirements, labor costs or also heavier public services charges.

As 90% of costs are represented by the infrastructure, the elaboration of appropriate third parties access fees cannot rely on short-run marginal costs. It raises several issues:

- The ability to incentivize an effective use and management of transport systems; through appropriate elaboration of pricing conditions for the different usages of the network (passenger/ freight), while reflecting the right incentives (e.g. for congestion avoidance) and be effective on investment planning without compromising economic viability of the system. Although the EU set pricing principles (marginal cost pricing), it has left some discretion to Member States leading to different national systems.
- The need for investment planning supported by significant resources. Financing requirements to anticipate and develop the necessary infrastructure, compatible with a sustainable transport system will be necessary. This supposes to emphasize the market share of freight services and correlatively to develop the adequate track system to settle a credible competitor to road services, in particular on international axes.

In practice, the liberalization process is too recent to assess in details its effectiveness. Early assessments show that in freight services (opened since 2007), liberalization has led to significant reconfigurations within the industry. Costs have dropped by 2%/year between 2001 and 2004 and tariffs have decreased by 3%/year over the same period (COM (2007) 608). Review of the Common Transport Policy (2009) show that in a large number of Member states, there have been a substantial number of entrants, whereas some others seem less interested to enter. National markets still tend to be dominated by incumbents, newcomers rather positioning on market niches.

Like in the energy sector, unbundling may reintroduce coordination costs whereas the economies of scope, legal features and interdependencies can make the case for tight coordination within the sector. As for energy, an association, Rail Net, has been settled to coordinate European Rail Infrastructure Managers and Allocation Bodies, in order to harmonize conditions of access to the network. However there is no supranational regulatory body to push for further harmonization and transparency of network pricing and access, in the view to reduce asymmetry of information, risk of regulatory capture at national levels etc. Unlike the energy sector, there is however an attempt to establish a pan European vision as regards infrastructure investment and development, in particular through the TEN-T policy. A redefinition of markets and access at pan European level is indeed an essential element towards sustainable transport systems and should be supported by EU instruments.

As a matter of fact, further effectiveness of liberalization process will pass through the reintroduction of tailored regulation (like for PSO), while addressing incentives to allow for the necessary capacity development also taking into account the needs of new entrants, the integration of railways systems with other transport modes, a reflective cost structure, and a pan European vision of infrastructure financing priorities. Instruments at EU level should be timely balanced as interoperability requirements and infrastructure development take time.

b) EU dispositions to improve energy efficiency from a technological and operational viewpoint:

In the last 20 years, the EU strategy for revitalising railways (the 3 “railway packages”) focused very much on opening of the rail transport market to competition and improving the interoperability and safety of national networks through towards more integration. Facing the lack of international technical regulation, the decision to establish the European Railway Agency in 2004 responded to the need to formulate common solutions for safety and rail interoperability within the EU and with neighbouring countries, also for the characterization of essential requirements (TSIs) to be met by the Member States for the development of the European high speed rail system (consisting of a set of infrastructures, fixed installations, logistic equipment and rolling stock).

However, it is interesting to note that there has been no regulation aimed at improving the energy efficiency of trains up to now, whereas energy costs will remain a restricted share of operating costs. For diesel trains, there is no policy instrument in place with the exception of the Directive on the taxation of energy products (see below), whereas the consumption of electricity by trains is indirectly impacted through the EU ETS. The EU project RailEnergy co-funded under the FP6 (2006-2010) aims at developing non-legally binding standards to stimulate energy performance of rail vehicles which may be proposed to European Standardization bodies (CEN/CENELEC), which calculate energy consumption per seat/km for given services profile (sub-urban, intercity, regional, high-speed and freight). But many participants believe that it will just lead to sub-optimization and not to substantial GHG emission reductions. Some suggest that the mass indicator (on top of seat/km) is also relevant because there is a clear link between mass and energy consumption<sup>3</sup>. In the end, regulation of emissions from rail may rather be looked at from the perspective of the whole energy chain, where EU legislation provides for a regulation of fuels used (Fuel Quality, Renewable Energy and EU ETS Directives), all the more since the rail network is already well electrified.

With regard to technological options to reduce GHG emissions from rail, electrification seems to be the most promising option in terms of GHG abatement potential if electricity is produced from low carbon or carbon neutral sources, in comparison to any other technical options (mass reduction, improvement of aerodynamic and reduction of friction). Regenerative braking systems capturing electricity can be a complementary source of energy to the electric trains or facilitate the transition of diesel trains to towards electrification. However, it is very difficult to quantify the GHG emission reduction potential from these technical improvements (taking account of rail vehicles’ lifetime: 30-35 years) and to identify where savings can be made. In contrast to the road sector, the rail sector is very much an interlinked system where infrastructure, train operating companies, and regulators strongly interact one with another.

Finally, interoperability technologies (ERMTS), eco-driving, improved vehicle utilization (including reduced traction maximum demand) and traffic management related measures as well as energy

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<sup>3</sup> Japanese high speed trains are benchmarks for best mass/seat: 0.537t/seat compared to 1.1 t/seat for TGV sud-est and 0.7t/seat for TGV duplex or 0.986-1.077 t/seat for ICE

monitoring could play an important role to save energy and reduce GHG emissions from rail transport to make it even more sustainable and attractive. The EU should continue to be active on that front.

#### B/ Internalisation of external costs:

Transport creates emissions, congestion and noise and imposes costs on the society. According to the European Commission, environmental costs of transport could reach 120 billion€ by 2020. It is essential that prices paid by transport users fully reflect the true costs, including external costs (emissions, noise, congestion and infrastructures...) in order to give the right price signal and level the playing field between the various transport modes. This is one way to provide transport users with a clear incentive to shift towards less polluting modes if it is accompanied by other measures intended to create more demand elasticity and price sensitivity. Actually, this is not the case today, and the EU has a key role to play to make its Greening Transport Package a reality.

##### a) The EU Acquis

The issue internalisation of external costs from transport is not new. Based on a Green paper released in 1995, the Commission put forward a White Paper in 1998 "Fair Payment for Infrastructure Use" which recommended marginal social cost pricing for transport infrastructure use aimed at improving the overall efficiency network usage and reducing congestion. Building upon this initiative, the 2001 White Paper on Transport identified specific actions, a number of which have been adopted through pricing or fiscal instruments:

- The Directive 2001/14 on allocation of railway infrastructure capacity and charging for the use of infrastructure (as subsequently amended);
- The "Eurovignette" Directive, introduced in 1999 and modified in 2006, establishes common rules related to distance based tolls and time-based user charges for good vehicles over 3.5 tonnes.
- The Directive 2003/96 on taxation of energy products;
- The Directive 2004/52/EC on the interoperability of electronic road toll systems;
- The Regulation 1794/2006 on laying down a common charging scheme for air navigation services.
- The Directive 2009/12 on airport charges;
- The Directive 2008/101 which includes aviation into the EU ETS.

However, there has been no progress with the proposal to adopt a Framework legislation on infrastructure pricing principles that was announced by the 2001 White Paper. Instead, the Commission put forward a Green Transport Package which focuses very much on road transport as a way to balance competition with other modes. It includes a Communication laying down a Strategy for the internalisation of external costs (COM (2008) 435) proposing an amendment to the Eurovignette Directive (COM (2008) 436) and the need to consider the review of the Directive on taxation of energy products in order to give greater consideration to CO<sub>2</sub> emissions.

Today, 2 years later, the negotiation of the new Eurovignette Directive is blocked in Council, despite a clear support from the European Parliament at its first reading, whereas the review of the Directive on taxation of energy products will be discussed at the College on June 23, 2010.

##### b) Strengths and weaknesses of current EU pricing instruments:

Achieving cost-efficiency to compete with road or air is not only a matter of increased efficiency in the rail industry. The way charging systems and final prices are elaborated will have a decisive impact on the relative economic competitiveness of each transport mode. Final prices will reflect the respective share of network access fees and operational charges. There may be a large diversity of arrangements to elaborate access fees in particular, how they include various types of incentives (e.g. congestion management, network development...). The way investments are financed and charged will particularly impact the final price structure passed to consumers. Therefore scrutinizing not only the apparent price structure but rather the whole chain costs and what actors are facing them will be determinant to assess the effectiveness of economic instruments aiming at establishing a level playing field between transport modes.

Actually, the only transport mode for which social marginal cost charging has been achieved is the rail transport with the amended Directive 2001/14. This legislation requires that rail infrastructure charges reflect the costs that are directly incurred through operation of the train service but also some charges

that reflect scarcity of capacity and environmental costs if comparable charges are applied to competing modes. If most Member States cover marginal infrastructure costs, there are some countries where total infrastructure costs are covered whereas some others have also applied congestion and scarcity charges to transport users and operators (e.g. Italy). In addition to the infrastructure charges, some countries levy excise duties on train diesel and/or electricity but at different level. The lack of harmonisation on rail diesel taxes does not create an incentive for switching to electric rail.

In addition, it is worth noting that Directive 2001/14 stresses the need to minimise the distortions of competition which may arise, either between railway infrastructures or between transport modes, from significant differences in charging principles.

But the reality looks different because there are many pricing and fiscal instruments which differ in scope and objective, and for the implementation of which decisions are taken by the Member States: transport charges and/or taxes are in general low for all modes, they do not reflect the true costs, and they are misleading because they respond to different policy objectives. So far, they have had little impact on CO<sub>2</sub> reduction and modal shift improvement. There is thus a need to better reflect infrastructure and CO<sub>2</sub> abatement costs in the name of the polluter pays principle enshrined by the TFUE (Article 191 §2), in order to drive structural changes.

- Differences in fuel taxation.

Fuel taxation can provide for an incentive for any type of fuel saving and can therefore contribute to GHG emission reductions. There is no a full harmonisation at EU level, in as far taxation of fuels is regulated through excise duties (indirect taxes on the consumption or the use of certain products)<sup>4</sup>. All EU Member States apply excise duties and freely fix their own rate levels above the minimum rates provided by EU legislation. The revenue from excise duties accrues entirely to the Member States. As far as energy products are concerned, the Directive 2003/96 defines the fiscal structures and the levels of taxation (minimum rates) to be imposed on energy products including coal, natural gas and electricity. However, it must be noted that Directives 2004/74 and 2004/75 granted temporary exemptions or reductions in the levels of taxation to the new Member States, until 2010, because the application of minimum rates were regarded as liable to potentially create serious economic and social difficulties in these countries.

Taking leaded petrol as an example, the minimum rate of taxation is set by the Directive at a level of 421€ for 1000 liters. Cyprus applies the same rate with a VAT at 15%, whereas the Netherlands apply a rate of 795,11€ with a VAT at 19% (source: Excise Duty Tables, DG TAXUD, REF 1030 rev.2, January 2010). EU legislation does not provide for a maximum level, and it does not harmonize the level of applicable VAT either. And despite the fact that Directive 2009/96 has integrated some environmental considerations, Member States decide on the level of taxation before all for fiscal reasons, not to internalize external costs, including CO<sub>2</sub> costs. In the end, there has been little convergence in tax rates, as Member States have pursued different policies (stepped increases in Germany, rapid increases in the UK, no increase in Spain), whereas fuel prices remain very different (very low in Luxemburg, very high in the UK).

An additional problem lies with the tax exemptions under Directive 2003/96:

- Energy products and electricity for electricity production and electricity used to maintain power production ability are exempted unless Member States decide, for reasons of environmental policy, to subject some products (fuel for aviation or inland) to taxation;
- Member States may apply total or partial exemptions or reductions in the level of taxation to some (low carbon) products, in particular to bio-fuels but also to energy products and electricity used for the carriage of goods and passengers by rail, metro, tram and trolley bus;

- How to level prices between road and rail?

Increasing and harmonizing the level of fuel taxes within the EU at a level that would fully internalize CO<sub>2</sub> emission reduction costs would greatly contribute to level the playing field between road/aviation and rail and reduce CO<sub>2</sub> emissions (since they are proportional to the amount of fuel used).

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<sup>4</sup> In contrast to Value Added Tax (VAT) which is a general consumption tax, excise duties are mainly specific taxes, i.e. expressed as a monetary amount per quantity of the product.

Harmonisation of fuel taxation among MS may have a significant impact, while putting a CO<sub>2</sub> tax over uneven tax structures would probably require setting the CO<sub>2</sub> price at a very high level to be effective<sup>5</sup>. One problem is that external costs of GHG emissions from transport are not easy to calculate and results greatly vary depending on the approach taken (damage cost versus avoidance/mitigation). In addition, many factors render particularly difficult to impose higher levels of taxation for the various fossil fuels: the non-tax element of fuel prices have increased and a higher tax rate may be hardly acceptable for transport users; fluctuations of oil prices and lack of visibility in the medium/long term may affect the price signal (although exchange rate movements in the Eurozone have helped mitigating the impact of fluctuations of oil prices on consumer petrol prices).

Another option is to add a levy on each kg of emitted CO<sub>2</sub> on the price of fuels used by non-ETS sectors such as transport (and possibly agriculture), which would basically constitute a EU carbon tax. In September 2009, the European Commission considered the application of a tax ranging from 0,01€ to 0,03€ per kg/CO<sub>2</sub> depending on where fuels would be used, with the possibility to grant exemptions to private users. This option should be scrutinized very soon and in a more concrete manner by the Commission, when the Collège will discuss on June 23<sup>rd</sup> about the need to revise the Directive 2003/96 on the taxation of energy products.

The main obstacle for the adoption of such EU carbon tax lies with the voting rule in the area of indirect taxation (excise duties and VAT) and other taxes that can affect the functioning of the Internal Market (like passenger car taxation<sup>6</sup>). Although the EU has a competence to adopt fiscal provisions, measures must be adopted by unanimity, whether on the basis of Article 113 TFUE or 115 TFUE. As a matter of facts, retaining unanimity in the EU Council for all taxation decisions, as it is currently the case, makes very difficult to achieve any tax coordination necessary for Europe, as for internalizing CO<sub>2</sub> related costs.

Therefore, one alternative option is to look at transport charges in the context of the EU Transport Policy, such as the Eurovignette on the charging of heavy goods which was established by Directive 1999/62 (as amended in 2006 in order to differentiate tariffs depending on vehicles' environmental characteristics). In effect, transport measures such as the Eurovignette are legally based on Article 91 TFUE, which can be adopted through co-decision at qualified majority (and not unanimity).

Existing road transport charges have not proved effective enough to internalise external costs of road freight transport. Tolls could be made more effective, but the current Eurovignette Directive blocks it. This is the reason why, in 2008, the Commission proposed to amend it again in order to set transport prices correctly so that they better reflect the costs of the actual use of vehicles, trains, planes or ships in terms of pollution, congestion and climate change. This proposal recognizes the need for a greater recourse to tolls which vary according to the distance to be travelled, the location and the time of use in proportion of the external costs caused by vehicles. It provides for common rules to avoid disproportionate or discriminatory charges and help calculation and modulation converge. However, the proposed framework leaves it to Member States to decide whether or not to levy tolls based on external costs. Interestingly, the Commission proposal opts in favour of a phasing-in approach enabling pilot schemes and encouraging a gradual build-up and sharing of experience instead of a binding approach based on mandatory user charges. The Commission argues that this approach can nevertheless reduce CO<sub>2</sub> emissions up to 8%. However, the Commission will review this strategy in 2013 to identify whether a more binding approach towards the internalisation of external costs is conceivable...in taking also into account the progress made in defining a common fuel tax element related to climate change in the Energy Taxation Directive, in order to decide whether the cost of CO<sub>2</sub> emissions should be allowed to be included in tolls.

The Parliament adopted its position at first reading on 11 March 2009, underlining that transport modes other than road transport have already started to internalize external costs and the relevant EU legislation either phases in such internalization or at least does not prevent it. It refers in particular to charging principles for the use of railway infrastructure. But the Parliament stressed that, in order to modulate track access charges more widely and have a complete internalization of external costs in

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<sup>5</sup> See SULTAN scenarios, <http://www.eutransportghg2050.eu/cms/assets/EU-Transport-GHG-2050-Report-VII-SULTAN-Illustrative-Scenarios-Tool-04-06-10-FINAL.pdf>

<sup>6</sup> See for example the Commission proposal relating to passenger car related taxes (COM (2005)261), whereby at least 25% of the total revenue from annual circulation taxes and registration should come from a carbon dioxide based element in the tax structure.

the railway sector, it is a precondition that the road transport sector also applies external cost charging.

Illustration of external cost: a road-rail freight transport comparison<sup>7</sup>

Cost of Externalities, (€ct/tkm)		Road freight (HDV>32t, EURO 3)	Rail freight
Noise	Day	0.61	0.12
	Night	1.12	0.49
Accidents		0.92	0.02
Air pollution	Urban Diesel/Train Electric	0.93	0
	Urban Diesel/Diesel Train	0.93	1.05
Climate change	Urban Diesel/Train Electric	0.23	0
	Urban Diesel/Diesel Train	0.23	0.08

*Assumptions*

- Unit cost values for HDV based on valuation factors for Germany.
- Unit cost values for freight trains based on valuation factors for Germany.
- HDV: urban: 11.4 tons/vehicle,
- Freight train: 348 tons/train.
- Congestion costs are excluded from these calculations

Indeed, with the revised Eurovignette, Member States could target Heavy Goods Vehicles which market share and GHG emissions are growing fast and indeed more rapidly than other modes (20% of total transport emissions in 2010, which should increase up to 29% in 2030; source: CE Delft, 2009, “The truth about the trucks”), with the exception of rail and inland navigation. But this would require charges to be applied in a harmonized manner and on a mandatory basis. This would effectively stimulate a shift towards green and distance based charging, thus providing an incentive to haulers to reduce empty runs and switch to HGV at the latest environmental standards or to less polluting modes, in particular rail for freight. Moreover, clarifying better the policy objectives pursued by the Eurovignette (efficiency, safety, environment protection, climate change mitigation) would help justify the allocation of revenues to the financing of efficient, safe and climate friendly infrastructures allowing more modal shift.

Other policy instruments may be considered by the EU in order to level the playing field among the various transport modes, in particular emissions trading and subsidies.

In theory, an emission trading scheme can achieve internalization of CO<sub>2</sub> abatement costs. However, including freight road transport in the EU ETS is not an optimal option because of administrative costs and the difficulty to identify the right level of responsibility at which the investment decisions can be effectively taken to reduce GHG emissions<sup>8</sup>. Aviation will be included in the EU ETS as from 2012, whereas rail already bears induced costs resulting from the use of electricity<sup>9</sup>. Including maritime shipping in the EU ETS will be considered if there is no concrete development towards the adoption of an international agreement through the IMO and the UNFCCC<sup>10</sup>.

Finally, subsidies and hidden subsidies (fuel tax, VAT exemptions, free access to and use of infrastructures) can affect negatively the playing field between the various transport modes. Beyond controversial discussions on the accuracy of estimates, subsidies allocated to the rail sector are

<sup>7</sup> Reference: Handbook on estimation of external costs in the transport sector, 2008 [http://ec.europa.eu/transport/sustainable/doc/2008\\_costs\\_handbook.pdf](http://ec.europa.eu/transport/sustainable/doc/2008_costs_handbook.pdf)

<sup>8</sup> Although a separated system is envisaged applied to upstream industries.

<sup>9</sup> Although one study carried out by INFRAS estimates that induced costs resulting from the use of electricity will lead to an additional annual cost of 500 million€ for the rail sector as from 2013, there is not quantified analysis of the share of CO<sub>2</sub> related costs in the overall cost structure for the rail sector and whether CO<sub>2</sub> costs can be passed through on rail users.

<sup>10</sup> As agreed under the climate and energy package, the EU will take steps to move forward if no such agreement has been agreed by 31 December 2011.

roughly two to three times less than those allocated to the road sector in the EU-15<sup>11</sup>. In 2005, VAT exemptions were 3 times higher for road and 6 times higher for aviation than for rail in the EU-15.

In the end, it is rather clear that financial instruments in rail transport have a relatively small GHG reduction potential, with the exception of harmonized fuel taxes on rail diesel and bearing in mind that the electricity is already covered by the EU ETS. From the perspective of fair and efficient pricing, rail pricing becomes important as soon as economic instruments are further developed in other modes, in order to make sure that there is a balance in terms of external costs.

It is difficult to estimate the GHG abatement potential from pricing and fiscal instruments because it depends a lot on their design, scope, level of charge and market and competition conditions as much as the setting of performance standards, the provision of the right infrastructures for more co-modality, and the promotion of technological and operational innovation.

### **III. Modal shift improvements and co-modality through infrastructure planning and financing**

Modal shift from the more polluting modes (aviation and road) to electric rail modes combined with an enhanced co-mobility amongst all modes is one policy option to achieve GHG emission reductions. For any large shift to occur, it is likely to require the provision of well-planned and targeted infrastructures. A major barrier is the lengthy time to take such infrastructure projects from conception to operation (often 15-20 years).

- Increased inter-mode substitution is required to achieve greater GHG abatement.

The GHG abatement potential of modal shifting fundamentally depends on the difference in GHG intensity (calculated on the basis of g. of CO<sub>2</sub>/km) of each transport modes and on the potential volumes of passenger or goods that can be shifted from one mode to a less polluting one. Moreover, it is important to look at projections on emission and market shares in the long term for each mode while considering the entire transport chain (including logistics and services) rather than just comparing the modes. Finally, modal shift and co-modality can only happen if there is a strong policy intervention without which trends are likely to remain unchanged. Actually, there are no reliable estimates available for the overall abatement potential for the reasons mentioned above (TREMOVE and STREAM models differ in many respects and look at different timeframes). Depending on the assumptions used, the "EU Transport GHG: Routes to 2050" Project reports that the abatement potential of modal shift from road to rail for passenger transport ranges from 2 to 14% and, for freight transport, from 4 to 23%<sup>12</sup> as compared to BAU. However, there seems to be a consensus on the fact the biggest GHG abatement potential lies in the freight sector if appropriate investments are made to support long distance and well connected rail freight, though it is obvious that modal shift from road to rail is not possible in all cases, for all goods or transport connections. In this context, the controversial discussion on whether the use of mega-trucks can effectively contribute to reducing GHG emissions is indeed relevant, also to see whether it would not shift demand from rail (and waterways) to road.

Modal shift and co-modality have been placed at the heart of the EU Transport Policy since 2001, but the facts show that it has not delivered yet. Indeed, the Marco Polo Programme (I and II)<sup>13</sup>, which is designed to reduce congestion and improve the environmental performance of the intermodal transport system, has been helpful in developing modal shift actions, in particular for shifting freight from road to short sea shipping, rail, and inland waterways. But, improving co-modality at the level of the EU territory and beyond requires more EU action for rationalizing the design, planning and provision of appropriate infrastructures.

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<sup>11</sup> The EEA Overview of total annual subsidies in the transport sector within the EU-15 (2005) gave 73 billion€ as the figure for rail subsidies, whereas the Rail Market Monitoring Scheme estimated in 2008 that total public financing to railways in the EU 15 reached 44.3 billion€ + 2.2 billion€ for EU-12 = 46.5 billion€.

<sup>12</sup> Upper limits are obtained on the basis of very ambitious levels of rail infrastructure provisions

<sup>13</sup> Regulation (EC) No 1692/2006 of the European Parliament and of the Council of 24 October 2006 establishing the second Marco Polo programme for the granting of Community financial assistance to improve the environmental performance of the freight transport system (Marco Polo II) and repealing Regulation (EC) No 1382/2003.

- Trans-European networks at the core of the EU strategy, but led to limited results.

The establishment and development of Trans European Networks (TEN) is a EU Policy (Article 170 TFUE) that includes networks and infrastructures, for the implementation of which the EU and its Member States have a shared competence. Launched in 1992 with the objective of overcoming the lack of integration and interoperability between national networks, the transport element of TEN ("TEN-T") has been developed to cover more interconnection between network modes further to adoption of the TEN-T Guidelines in 1996, as amended in 2004 to take account of the enlargement process. It is worth noting that these TEN-T Guidelines pay a particular attention to rail: its Article 5 c) stipulates that the necessary measures for the gradual achievement of an interoperable rail network, including, where feasible, routes adapted for freight transport is among the key priorities to be achieved through TEN-T, whereas its Article 10.5 of TEN-T Guidelines states that the rail network should play an important role in combined transport.

The Guidelines include two planning layers: a comprehensive network layer (outline plans for rail, road, inland waterway, combined transport, airport and port networks) and a second layer of 30 priority projects – i.e. selected projects of common interest, to be achieved by 2020. The comprehensive network comprises altogether: 95 700 km of road links, 106 000 km of railway links (including 32 000 km of high-speed links), 13 000 km of inland waterways, 411 airports and 404 seaports. Still, almost 20 000 km of the road links, and more than 25 000 km of railway links (high-speed lines) are still to be built by 2020.

So far, the TEN-T has had limited results, from the perspective of both the development of an integrated intermodal network. At best, it is regarded as an aggregation of transport corridors. It is far from being implemented. Only 4 of the 30 priority projects have been fully completed<sup>14</sup>, and it is likely that all will not be finished by then. This can be explained by many reasons (development of road traffic demand, step by step liberalisation of transport market, EU enlargement, difficulty to control investment costs, delays in implementing projects...etc.), but certainly because much of the planning and investment decisions and the financial burden rests on the Member States.

In effect, planning has essentially meant adding together significant parts of national networks for the different modes and connecting them at national borders. In this context, the potential for interconnection and extension (both geographically and modally) has not been really explored. From that perspective, the TEN-T policy was rather regarded as a financial instrument, though with a limited budget. As a matter of facts, EU funding is quite low and, despite the recent efforts of the TEN-T Agency, its disbursement is badly coordinated between the various financial instruments or institutions (8 billion€ through the TEN-T budget<sup>15</sup>, 47 billion€ from the Structural (ERDF) and Cohesion Funds<sup>16</sup>, and 65 billion€ through EIB loans and guarantees, for the 2007-2013 period). In contrast, national funding is of 196 billion€ for the same period. Total costs of implementation of the 30 priority projects are estimated at 860 billion€ until 2020, of which 350 billion€ must be invested between 2007-2013 period, but there is financing gap of 50 billion€ for this period when looking at the funding made available by the EU and its Member States.

In terms of modal distribution of investment in priority projects, it is worth noting that, although it is planned to dedicate the largest part of expenditure to railways priority projects (85%) by 2020, actual expenditure on rail and inland waterways has been lower than expected, whilst the share of investments in road projects outperformed their total share of expected costs to date (source: DG TREN Implementation of the Priority Projects Progress Report, 2008).

It is also interesting to stress that there the level of expenditure earmarked for transport projects funded by the Cohesion Fund is much higher in the EU-12 (67,6%) than in the EU-15 (32,4%) for the 2007-2013 period, with 25 billion€ spent in Poland.

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<sup>14</sup> 37% of rail projects, 56% of road projects and 49% of inland waterway projects.

<sup>15</sup> The TEN-T financial Regulation (EC) 680/2007 limits EU financial aid to priority projects at a maximum of 20% of eligible costs. This rate can be increased to 30% for cross border sections. For other (non priority) projects, it can only be of 10%. For feasibility studies, eligible costs are capped at 50%.

<sup>16</sup> Funding under the Structural and Cohesion Funds can go up to 85% of eligible costs in eligible Member States.

- The need to review the TEN-T policy.

Recognizing the need to review the current TEN-T policy to make it really at the service of the EU Transport Policy, the Commission tabled a Green paper in 2009 which suggested three main options to resolve the problems encountered in TEN-T policy, in particular the development of a double layer of planning based on the existing comprehensive network layer on the top of which would be added a new core network layer, that would consist of two pillars: geographical (priority axes, connection of national networks) and conceptual (infrastructure measures and equipping networks aimed at improving operation and services). Relying on the strong support expressed by a great majority of stakeholders through the consultation process for this dual layer approach, the Commission tabled recently a Communication on the future TEN-T Policy<sup>17</sup> which advocates that such core network would “give expression to a genuine European planning perspective focused on bringing about a systemic improvement in the transport system's resource efficiency and a significant overall reduction of greenhouse gas (GHG) emissions from transport”. The “core network” would include axes and nodes of vital importance for transport to make it multimodal and coherent, and it would provide, for all transport modes and across the modes, “the necessary infrastructure basis for the achievement of common transport policy objectives required to match the “Europe 2020” and decarbonisation agendas”.

This Communication is the first policy document from the Commission that places the reduction of GHG emissions from transport as an overarching objective of the TEN-T policy. GHG reduction has never been an eligibility criterion for EU funding and there has been no requirement to measure GHG impacts of priority projects up to now. In particular, Article 8 of the current TEN-T Guidelines requires from any transport project to be developed in full compliance with the Environmental and/or Strategic Impact Assessment (EIA and SEA) Directives, however it is recognised that EIA does not adequately address GHG emissions and should be further improved. .

One can only welcome this Commission initiative to make the future TEN-T Policy becoming a real planning tool towards a more integrated and multimodal European network. This will require an appropriate coordination of infrastructure development going beyond mere connections at common State borders. However, one can also be sceptical about the success of such initiative, not just because of the sensitivity of all Member States with respect to their sovereign responsibility in the field of infrastructure planning and implementation on their territory<sup>18</sup>, but also because the Commission is not yet clear as to how such paradigm shift can effectively happen.

The Commission points out that planning the core network does not mean that a new large scale infrastructure programme will be initiated. Rather, the core network should build upon the existing comprehensive network, ensuring continuity for ongoing projects, giving due attention to the removal of key bottlenecks and building largely on existing infrastructure while promoting innovative infrastructures. A key question is to know whether this will be enough to create the basis for an efficient, multimodal, less carbon intensive, safe and secure transport system. How to avoid that investments in infrastructures for transport using fossil fuels are locked-in if the core network only provides for minor infrastructure development? For instance, further development of the European high-speed rail network should be a top priority for enhancing modal shift from air and road to rail. Similarly, long distance freight rail should be promoted through the construction of new connection to the main lines and terminals.

- The need to improve the EU financing strategy.

The Commission proposes to use “decarbonisation” as a general principle for designing TEN-T at all strategic levels, but it does not say precisely how to make this operational, bearing in mind that there is no EU cap on transport emissions. For instance, strategic and project assessment of GHG impacts must be part of the process. Should the EIA and SEA Directives be amended to include GHG impacts? Should GHG impacts of benefits become an eligibility or exclusion criteria for EU funding or financial support (through EIB loans)? Indeed, this could work well, but only if EU funds would be significantly increased and if there would be a climate proofing approach in all EU financial instruments, which is far from being the case at this point of time.

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<sup>17</sup> COM (2010)212 final of 4 May 2010.

<sup>18</sup> The Communication of the Commission on the Future TEN-T Policy has been presented to the Ministers in charge of transport that attended the Saragossa Conference organized by the Spanish Presidency of the EU on June 8 and 9, 2010.

The current poor consistency and lack of coordination between the TEN-T budget and the Cohesion Policy poses a real problem, though the two programmes aim at contributing to the similar objectives with regard to transport policy (e.g. TEN-T budget should trigger the project, the Cohesion Fund budget should build the project). But the Cohesion Fund is managed in such a way that the expenditure reflects national priority setting, whereas the TEN-T budget is so low that it cannot leverage projects reflecting EU policy priorities. The Commission Communication of 4 May 2010 acknowledges this problem and calls for a better coordination of financing arrangements at EU level, which need to be “*embedded within a clear EU funding strategy, which would increase its added value in the implementation of EU objectives*”. Consequently, consideration should be given to setting up an “*integrated European funding framework to coordinate EU instruments for transport*”, according to the Commission, adding that “*such a European funding framework would require the development of fair, transparent and efficient criteria to identify the projects to be supported, depending on the European added value of the project*”.

Will it give birth to a new EU Fund dedicated to sustainable transport infrastructures? This does not seem to be a priority at this stage as this would necessarily prejudice the discussions on next financial perspectives (2014-2020) that will start next year. Unless expenditure for transport infrastructures in the EU budget significantly increases in the future, and unless the rates of co-funding are also increased, the Commission proposal may well be regarded as a wishful thinking exercise because a better coordination of existing financial instruments at their current levels may not suffice to leverage EU policy priorities. In any case, this funding management discussion should be linked to a discussion on governance for the management of strategic transport corridors, where EU coordinators or a EU governance body (as the one referred to in the legislative proposal on the competitive rail freight transport) could provide advice for the disbursement of all EU Funds<sup>19</sup>.

In the current context of public deficits, the role of the EIB is seen as becoming more and more important, not only through its lending policy and its capacity to provide adjusting tools (guarantees, bridge financing) but essentially to support the development of Public Private Partnerships (PPP) the use of which has recently increased for delivery of key transport infrastructure (+50% between 2007 and 2009). In effect, the EIB can contribute to funding through various instruments (SFF<sup>20</sup> and LGTT<sup>21</sup>), but also to strengthen capacity for PPP development through the European PPP Expertise Centre (EPEC) launched in 2008. The main merits of PPP is to leverage the comparative advantage of the private sector to finance and manage capital risks and to implement projects that would be otherwise unaffordable, and to shift the financial burden from tax payers to infrastructure users. But “one size does not fit all”, as PPP are complex, in particular with regard to contractual arrangements, and not suitable for all projects, in particular for rail (with the exception of high speed trains<sup>22</sup>).

But, as for the disbursement of grants through EU Funds, it is crucial to improve the criteria and methodology for project selection used for EIB support, also through PPP, so as to ensure that the most decarbonised transport projects will be targeted first. In addition, the EIB could also further cooperate with national authorities to set up financing schemes for transport infrastructure projects where transport revenues from charging systems such as Eurovignette could be earmarked and directly recycled.

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<sup>19</sup> Note that the JASPERS Programme aims at providing consultative assistance (study grants) to the Member States to improve the absorption of Structural and Cohesion Funds and to make the best use of EU funding, including through the involvement in PPP programmes and projects.

<sup>20</sup> Structured Finance Facility that can cover construction risks.

<sup>21</sup> Loan Guarantee Instrument for TEN-T, jointly funded by the EIB and the EC that mitigates the revenue risks for projects being financed based on user pay and traffic revenues.

<sup>22</sup> See for example, the “High Speed Line South” linking Amsterdam/Paris/Brussels/London).

#### **IV. Questions for the attention of Dialogue participants:**

- How to improve the emerging discussion on a long-term vision on sustainable transport within the EU? There is a need to make now such vision(s) (intra-modal and inter-modal) more explicit in order to ensure consistency and complementarities between policy objectives while driving real structural changes to happen as soon as possible (avoid lock-in effects).
- What should be the marker of the decarbonization of transport systems, including through milestones for structural and infrastructure changes, in the framework of such long-term vision? Should the EU set a non-legally binding though aspirational GHG transport emissions reduction target by 2050 to guide key investment decisions in the short and medium term? Should the EU set other types of objectives (quantitative and qualitative) accompanied by a series of indicators to monitor progress towards achieving any such objectives?
- Is there an implicit consensus not to manage transport demand at EU level? How to reconcile connectivity (links between economic and social activities) and mobility (response to connectivity needs)? Does the EU have the relevant instruments in place to influence infrastructure design and planning in anticipation of transport demand?
- What are the more relevant elements from cost imbalance that should be urgently addressed by the EU to induce a level playing field between all transport modes?
- How to adequately internalize external costs in a balanced manner across all transport modes with significant effect on modal shift towards less polluting modes?
- What are the business models towards more integrated rail systems with other transport modes? What are the hurdles? Should the EU concentrate on the connection of major rail freight corridors in the first place?
- How to make EU funding and support leveraging the planning and provision of appropriate infrastructures?
- How to strive for the design of a common long-term sustainable vision while accommodating national circumstances to ensure intra-EU solidarity and cohesion?

#### **V. Suggestion for next steps (Venice meeting):**

Capacity of the EU to influence national and local policies to curb GHG emissions from urban transport.