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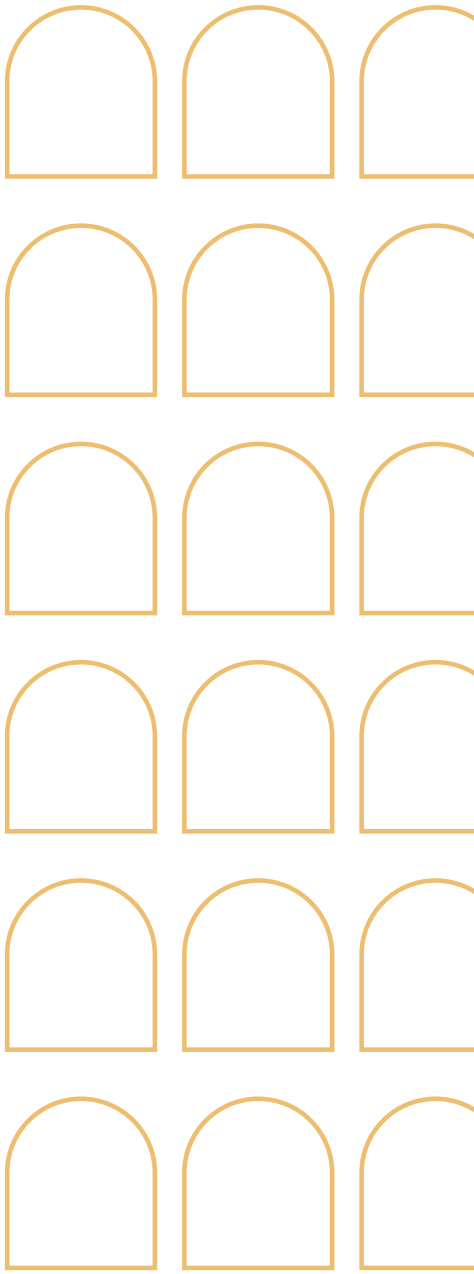
POLICY BRIEF

EUROPEAN TRANSPORT REGULATION OBSERVER

Greening European Cargo Operations



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Highlights

Around 75% of European cargo transport operations in terms of ton-kilometers are performed by trucks, which, in turn, entail massive environmental and societal impacts. Prior to the COVID-19 pandemic, road freight was projected to increase by around 40% by 2030 and by little over 80% by 2050. To support the greening of cargo operations, the European Green Deal calls for a substantial part of the inland freight traffic to shift away from road towards cleaner modes such as rail, inland waterways and short-sea shipping. The subsequent Sustainable and Smart Mobility Strategy stipulates that rail freight traffic should increase by 50% by 2030 and double by 2050, whereas transport by inland waterways and short sea shipping should increase by 25% by 2030 and by 50% by 2050.

In this context, the European Commission has pledged to substantially revamp the framework for multimodal transport by revising the Combined Transport Directive, among other instruments. The scarcity of transhipment infrastructure, and of inland multimodal terminals, in particular, would need to be addressed, and missing links in multimodal infrastructure closed. Moreover, work is underway to establish a common framework for the harmonised measurement of transport and logistics-related greenhouse gas emissions based on global standards. This stands to empower consumers and businesses to make more sustainable delivery and transport choices through the provision of adequate information on the climate footprint as well as on the available alternatives of their deliveries.

Inspired by the discussions at the 8th Florence Intermodal Forum, this policy brief reflects on the various measures to green European cargo operations, with a focus on boosting the share of multimodal freight and creating a common carbon accounting framework.

Authors

Matthias Finger and Teodora Serafimova

How to think the greening of European cargo operations?

A comment by Matthias Finger and Teodora Serafimova, Florence School of Regulation – Transport Area

The greening of European cargo operations requires actions at numerous levels, each of them having a different time horizon, which itself stems from the very nature of the investments needed. This is best conceptualised in terms of a layered model. All these actions will, of course, have to be coordinated across time and across the different layers. We suggest to distinguish the following four layers:

1. Infrastructure layer: shifting towards greener modes, while rendering all modes continuously greener

The bottom layer is constituted by the infrastructures, which are needed for greening cargo operations. Infrastructure investments required for greening have several dimensions, and include those targeted at further improving the greenhouse gas (GHG) efficiency of all transport modes with a particular focus on electrification and the uptake of other sustainable fuels but also investments into transboundary corridors and rail infrastructures more generally.

Rail and waterborne transport have the lowest emissions per kilometre and unit transported in Europe (European Environment Agency, 2021). In recognition of their superior environmental qualities, the Commission has reaffirmed its commitment to boosting the uptake of sustainable multimodal transport through a set of concrete policy actions laid down in its Sustainable and Smart Mobility Strategy (e.g., revising the Combined Transport Directive).

Notwithstanding, it should be noted that there are still many rail tracks in Europe that are not yet fully electrified. Shifting an increasing volume of goods onto railways will only make sense if these remaining lines are electrified or powered by other renewable fuels, such as hydrogen. This will have to go hand-in-hand with continued efforts to reduce the carbon intensity of the EU's electricity mix. Similar principles apply to inland waterways and short-sea shipping.

In parallel to the pursuit of modal shift objectives, investments should accelerate the uptake of efficient zero-emission trucks, but also newer concepts such as electric highways, which entail connecting electric trucks to overhead power lines. It goes without saying that the renewal of existing fleets will have to be accompanied by investments into the relevant recharging and refuelling infrastructure.

There is also a need for investments into rail freight corridors, especially transboundary investments where the corridors are not yet fully equipped. Furthermore, investments will be necessary into rail more generally, if we also want to shift to rail at a more local level. In fact, whereas the European Green Deal stresses the role of rail above 300 kilometres, the experience of Belgium illustrates that there is significant potential for modal shift also over shorter distances. All these investments necessitate the commitment of financial resources and time, i.e., need to be planned and then approved, etc., which, in turn, underscores the need to start acting immediately.

2. Intermodality layer: boosting transhipment infrastructure, and pursuing standardisation

The second layer pertains to intermodality and consequently investments into transhipment infrastructure. Indeed, inter- and multimodality pertain to transferring goods from first-mile trucking to rail or inland waterways and there again onto to last-mile trucking. Multimodality needs to be made easy and this requires dedicated transhipment terminals, which in turn require investments. But such investments are not just into infrastructures, i.e., mainly buildings, but also, for example, into containers or semi-trailers that are easily transferred from road to rail and backwards. Containers and semi-trailers, in turn, need to be standardised. Finally, there are still investments needed into equipment for interoperability between trains and tracks.

3. Data layer: investing in digitalisation to improve economic and ecological efficiency

The third layer is constituted by the digital level. This data level is the new interface between the physical – multimodal – transport on the one hand and the user/customer on the other. In our case, customers are the intermediaries, i.e., shippers.

Shippers today continue to face a lack of reliability, especially when it comes to cross-border rail services resulting from fragmentation and the prevalence of national rules. Data about the state of the infrastructure, its level of congestion, available transport capacities, prices, timetables, routing options and many other more need to be made available to digital platforms, which subsequently can develop services. At the same time, these platforms can also be used for the operations and management of the multimodal infrastructure as an integrated system. The goal is to operate this system in the most efficient way, optimising simultaneously economic and ecological efficiency.

The digital layer also requires investments, mainly into sensors, data-centres, but also analytics. Investments in digital infrastructure are, in fact, said to deliver up to 30% of potential capacity increase thanks to a more efficient capacity utilisation (CER, 2020). Not the least, these will have to be complemented by standardisation efforts along with a secure and trusted framework for data exchange.

4. Regulatory layer: creating conducive framework conditions for sustainable multimodal transport and logistics

The fourth layer is constituted by policies and regulations pertaining to the planning, investments and operations of this integrated multimodal cargo system. We have already mentioned the policies regarding data sharing and standardisation. One also needs policies pertaining to physical standardisation, congestion management and pricing. All these policies and regulations set the incentives at the three preceding levels that are infrastructure, interoperability and data. As confirmed by the discussions of our 8th Florence Intermodal Forum, one also needs policies about the underlying taxonomy and measurement of the operations' environmental footprints. Only an unambiguous taxonomy and a precise measurement can generate the data that are needed to set science-based targets, monitor improvements in environmental performance over time, as well as steer modal shift and decarbonisation efforts altogether.

In all of this, we need a systemic view, as well as a local articulation in time. The first layer will take longest to produce its decarbonising effect and the fourth layer will take least of the time. Yet all of them need to be considered simultaneously in a very coherent approach. Obviously, digital platforms will play a key role in all this.

To conclude, let us state that all these actions need to produce real effects on decarbonisation, as opposed to merely shifting the costs, the emissions, the subsidies or the responsibilities to some other place. Indeed, it is easy to make someone else pay (e.g., future generations), to shift the emissions to someone outside of the European system (e.g., China), to subsidise in an inequitable manner, making decarbonisation a burden for some and a profit for others. Finally, responsibilities need to be properly attributed in a balanced way.

Most logically, this will be a European system, optimised at a European level, while at the same time, leaving room for subsidiarity where it makes most sense. The approach should be pragmatic and no time should be wasted with perfectionism. Rather we should inbuild into such an approach a learning mechanism, by which this multi-layered system can rapidly adapt to changing situations.

Main Takeaways from the Discussions

By Teodora Serafimova, Florence School of Regulation – Transport Area

The European Green Deal provides for a collective 90% reduction of greenhouse gas (GHG) emissions from transport by 2050 compared to 1990 levels. This poses a particular challenge for freight transport, whose activities are predicted to increase by another 50% by 2050, and calls for urgent measures to be implemented to curb the sector's emissions. The Sustainable and Smart Mobility Strategy (SSMS) published in December 2020 sets out to achieve the objectives of the Green Deal by putting forward an action plan of 82 initiatives in 10 dedicated flagship areas. The 8th Florence Intermodal Forum provided a platform for discussion on two of these initiatives, namely multimodality and carbon accounting.

The SSMS establishes the three guiding pillars to decarbonise transport, including the need for all modes of transport to become more sustainable, the need for green alternatives to become more widely available in a multimodal system, and the need to enact the right incentives to drive the transition.

Multimodal transport is more sustainable, especially as compared to road only transportation, given that it supports the reduction of negative externalities while rendering the transport system more agile and resilient. The availability of infrastructures, such as transhipment terminals and a comprehensive transport network covering the main transport routes, constitutes an essential precondition to boosting the share of sustainable multimodal transport. To this end, the European Commission is currently preparing a revision of the Trans-European Transport Network (TEN-T) Guidelines, with a proposal expected in the fourth quarter of 2021. By reviewing the guidelines, the Commission will seek to ensure that the TEN-T is integrating and interconnecting all transport modes by safeguarding the availability of the necessary infrastructure. What is more, in 2022, the Commission will be tabling a new legislative proposal to revise the Combined Transport Directive with a view to transforming it into an effective tool to support multimodal freight operations. More specifically, the revision will aim to increase the ambition level and scope of the Directive compared to the previous proposal of 2017.

Furthermore, the Commission is working on a new initiative aimed at establishing a common European framework for the harmonised measurement of transport and logistics GHG emissions, which is expected by the end of 2022. The primary goal of the initiative is to enable the reliable measurement of GHG emissions and a fair comparison between different transport options in the multimodal perspective based on the GHG performance. The availability of precise, validated and reliable information on the GHG aspects of transport operations could incentivise more sustainable choices and become a competitive advantage for those offering greener transport solutions. Currently, a number of various GHG emissions accounting methodologies and calculation tools are in use, leading to scattered and inconsistent data on GHG transport emissions. This situation prevents from a consistent comparison and benchmarking of different transport services based on their GHG performance, thus calling for an overarching EU framework, applicable to all transport modes, to be put into place.

Boosting the share of multimodal freight transport

The transformation towards zero-emission mobility requires an integrated multimodal approach to deploy to the largest extent possible the most sustainable modes, such as rail, inland waterways and short sea shipping. The Combined Transport Directive is the most important Union legal instrument supporting intermodal[1] freight transport and more specifically the shift to lower emission transport modes (rail, inland waterways and short sea shipping), thereby reducing carbon emissions and other negative externalities of the transport sector. To put things into perspective, when compared to road transport and when carrying the same amount of cargo, rail for example is associated with nine times less CO_2 emissions, eight times fewer air pollutants, six times less energy consumption and 85 times fewer casualties. One train also means 40 trucks less in traffic.

1 'Intermodal transport' is movement of goods (in one and the same loading unit or a vehicle) by successive modes of transport without handling of the goods themselves when changing modes. It is hence a type of multimodal transport. 'Multimodal freight transport' is carriage of goods by at least two different modes of transport. 'Combined transport' is a subset of intermodal transport meeting certain criteria defined in the Combined Transport Directive.

Despite its lower environmental footprint, its ability to carry larger volumes, and its higher energy efficiency, rail freight requires consolidation and massification to achieve large volumes. This, in turn, comes with extra costs when compared to road only transport. In addition, even if the main part of a journey takes part on rail, there is usually the need for a road leg for the last- and first-miles, shunting and transhipment in terminals. This makes intermodal transport always more complex and costly than road only transport. Boosting the share of intermodal transport in line with the objectives of promoting more sustainable freight transport as laid out in the Commission's SSMS will depend on the ability of the sustainable modes to improve their reliability, flexibility and resilience. Support may be necessary to allow intermodal transport to become more competitive over shorter distances.

Rail freight transportation is a European business, whereas 50% of operations are international, which underscores the need for a European approach to regulation. European industry and logistics clusters need to be better integrated and interconnected for better use of rail freight transport. Intermodal rail transport is growing faster than traditional rail freight. In Switzerland, for instance, 70% of transalpine freight transport is on rail, whereas intermodal transport makes up the highest share. This illustrates that it is possible to achieve a high share of intermodal transport as long as the right framework conditions are in place.

Today, the choice of transport mode is primarily driven by cost considerations. Intermodal transport, however, needs to compete with road only transport where the level of internalisation of external climate and environmental costs is currently lower than for other modes. Internalising the external costs of transport will thus be vital in driving the competitiveness of cleaner options and advancing the EU's cleaner transport objectives. It is also important to provide complete and transparent information to transport users about climate and environmental performance of their transport choices. Drawing on the fact that most road transport operators tend to be SMEs, participants called for the need to incentivise them to consider intermodal choices and make the necessary investments into equipment (e.g., craneable semitrailers, swap bodies). While EU level measures will need to be implemented to better account for the CO_2 cost of road transport operations (e.g., revised Eurovignette Directive on charging for road infrastructure use), participants also called for support mechanisms to move away from unimodal towards multimodal solutions. To put things into perspective, participants quoted studies indicating that a handling cheque of €40 per unit from road to rail or barge to compensate transhipment costs could enable the removal of ca. 1.300.000 truck trips from the road. Furthermore, participants urged the need to reflect on who would be the right recipients of such support (i.e., the operator, shipper, forwarder) to ensure its effectiveness in driving the uptake of intermodal solutions.

A systemic view of transport is crucial to safeguard functioning supply chains and the resilience of the entire system in times of crises. The lessons learnt form the Rastatt accident, which in 2017 paralysed rail freight traffic during seven weeks on the Karlsruhe-Basel line of the Rhine-Alpine Corridor, have still not been sufficiently implemented. Despite the TEN-T Guidelines, a common European approach to infrastructure is still missing. In view of this, participants were unanimous over the need to ensure that both major and minor disruptions and temporary capacity restrictions are to be managed in a more flexible and swifter manner in the future by reinforcing Rail Freight Corridors.

While maintenance and construction works are necessary, participants underlined that these works need to be coordinated across the borders and in case of disruptions even postponed to optimise capacity and reduce costs and risks for railway operators. Furthermore, additional infrastructure investments into terminals and network expansion are necessary to ensure more capacity on the lines, sufficient train frequencies, and better reliability. While there was consensus over the critical role of digitalisation and automation in further boosting the efficiency of freight operations across the network, terminals and hubs, and thereby optimising capacity, participants cautioned against excessive data requirements, which could act as barrier to market entry.

Moreover, the need to implement minimum train parameters in terms of length, weight and profile (i.e., 740 m, 22,5 tons axle load, P400) on the railway infrastructure was highlighted as a means to optimise the capacity and productivity of rail freight. Pointing to the current lack of facilitation on access to intermodal terminals, participants called for additional aspects to be factored

into the revision of the Combined Transport Directive, such as access to terminals and flexibility to switch terminals in case of capacity issues. Stakeholders underlined also the need to make semi-trailers craneable, quoting that 75% of transalpine transit in Switzerland relies on semi-trailers. Revised TEN-T Guidelines should also provide for a sufficient European terminal network with both, vertical and horizontal handling technologies in order to enable the take-up of intermodal transport.

The discussions revealed that use of intermodal transport is not only relevant for longer distances but also for shorter distances (i.e., less than 300 kilometres). Here the Belgian case has been illustrative, given that roughly 50% of road transport operations are purely national, whereas 21% are export-related, 18% import-related, and only 10% transit-related. 12% of Belgian road transport is over short distances with high rail affinity (e.g., chemicals, chemical products, basic metals, wood etc.). Shifting this 12% of goods onto rail would result in a doubling of rail freight in the country. This calls for greater emphasis to be placed on short-distance trains, which in turn can also foster growth in rail freight over longer distances. Rendering intermodal transport over shorter distances more competitive will necessitate reducing costs linked to control, holding, first- and last-mile, handling and transportation time, while compensating transhipment cost.

While rail freight has attracted particular attention, it should be noted that intermodal transport extends beyond rail to inland waterways and short sea shipping, both of which, given saturation of railways, play an increasingly important role in intermodal transport. Participants urged the need to simplify the 'motorways of the sea' concept and identify a clear project type to streamline funding rules and criteria. In the ports of Antwerp and Rotterdam, for example, the vast majority of cargo transported to the ocean ports relies on a combination of trucks and inland waterways. Even though a high density of traffic flows to ports, a shift to rail and inland waterways continues to fall short of expectations. One hurdle has been the climate change-induced low water levels on the Rhine river, which led to a temporary switch back to trucks. Rail freight would need to become more attractive in terms of flexibility, reliability, and service quality to be seen as a feasible link to deep-sea ocean vessels. In terms of infrastructure, last-mile connections and a strategic network of terminals in proximity to the ports is crucial in order to shift also short distance transport to rail or barge and alleviate congestion in urban areas.

The EU approach to greening transport has been two-fold: to render each mode more sustainable and improve the functioning of the transport system as a whole. While greening each mode is costly, rendering the entire system more efficient can reduce costs. For many years transport has been regulated in modal silos, which in turn stands in the way of achieving system-level optimisation. A takeaway from the discussions was the need to improve modal cooperation and interaction. The pursuit of more sustainable transport objectives and the subsequent decrease in the share of unimodal transport, it was argued, should not result in efficiency reductions in the use of another transport mode. While some stakeholders were supportive of a night-time driving ban for trucks, others cautioned that it could severely constrain supply chains and create even more bottlenecks during daytime for intermodal transport, in particular its first- and last-mile connections.

There is currently limited data on freight transport capacity utilisation (in terms of load factors and empty runs) on the European level, as neither Eurostat nor national governments collect such data. In the absence of a solid understanding of how well the assets are being utilised, there is a tendency to fall back on average figures. Participants noted the existence of a modal bias in reference to the fact that assumptions made for the utilisation of trains tend to be higher than the average assumptions for road freight. This calls for greater transparency on the vehicles' load factors to deduct how this impacts the relative carbon intensity.

The Combined Transport Directive takes an intermodal approach, though its scope is currently limited. Its revision will be an opportunity to pave the way for a European level sustainable multimodal freight regulation. The revision will consider the scope of operations and the range and eligibility criteria for regulatory and economic support measures. The Commission will also analyse whether any obligations need to be set on terminal or transport operators (e.g., on exchange of data) to ensure efficient performance of terminals, to ensure that the existing capacity is best used. Participants welcomed an extension of the definition of 'combined transport', taking into account the development

of the freight transport market. Though there was broad agreement over the need to extend the scope of the Directive, the question remains as to whether a sub-section should be kept for the current combined transport definition together with Article 4 to maintain the benefits linked to it. Participants cautioned that if the current scope were to be extended to incorporate all intermodal transport or a bigger sub-set of intermodal transport while retaining Article 4 in its current state, there would be strong resistance from national governments and the European Parliament.

Support was expressed for a common European framework setting out the conditions for eligibility of the support under the Combined Transport Directive instead of different national approaches, in particular, to ensure smooth functioning of the EU internal market. The continued exemption of the road leg of combined transport from cabotage rules is necessary, given that these are, as Ruled by the European Court of Justice, an integral part of international transport chains. At the same time, participants underlined the need to avoid a situation where the Combined Transport Directive rules are used to circumvent the cabotage restrictions in pure road transport. Among the proposals to boost the efficiency of intermodal transport was the need to permit higher weights on road legs (e.g., by defining 48-ton or 52-ton zones around combined transport terminals). Existing and new privileges for road haulage (e.g., public support for transhipment, road charges exemption) should be set so that these would incentivise intermodal transport.

The revision of the Combined Transport Directive cannot be tackled in isolation and needs to be seen in the broader regulatory context by considering its interplay with the Rail Freight Corridors (RFCs) Regulation and the TEN-T Regulation, among others. What is more, the ongoing revision of the Community guidelines on State aid for railway undertakings will be instrumental in accelerating modal shift objectives in the shorter run. In particular, participants noted that current thresholds for State aid need to be raised and the authorisation process streamlined. Not the least, participants agreed that the revised Combined Transport Directive needs to reflect digitalisation of freight operations.

Establishing a European framework for the harmonised measurement of transport and logistics greenhouse gas emissions

The idea to establish a harmonised EU carbon accounting mechanism dates back to the Commission's 2011 White Paper on Transport. In the subsequent years, the European Commission supported specific actions and research projects undertaken by industry to harmonise the carbon footprint measurement in transport. In 2020, the common framework for GHG emissions accounting was recognised as an important measure to support the green transition of the transport sector, and as such, it became part of the Action Plan launched by the Commission in the context of the Sustainable and Smart Mobility Strategy. The 8th Florence Intermodal Forum discussions demonstrated a growing interest also on the part of the industry, which is becoming increasingly aware of the business case related to carbon accounting. Firstly, improving the efficiency of operations offers win-wins in terms of cost and environmental emissions savings. Secondly, the ability to demonstrate improvements in environmental performance stands to attract environmentally-conscious customers willing to pay extra for greener solutions. The Forum focused on the 'freight' aspects pertaining to the setting up of a common carbon accounting framework.

The measurement of emissions is an essential prerequisite for managing the decarbonisation process. In the absence of accurate data, it is impossible to adequately commit science-based targets, assess options for decarbonisation, and track progress in reducing emissions over time. On the macroeconomic level, a harmonised measurement of emissions allows for consistency and comparability, which in turn, are crucial factors in enabling shippers to compare the carbon reports received from different forwarders. However, having a sophisticated carbon accounting system in place will not suffice unless all cargo operators use the same methodology. The future framework for calculating GHG emissions needs to be reliable, relevant, and accurate to enable adequate comparison of emissions from transport operations, thereby placing all modes and operations on equal footing. These attributes will be decisive in determining the framework's acceptance and use by all stakeholders. On the microeconomic level, individual businesses are confronted with the challenge of allocating CO_2

data, where vehicle capacity is shared (e.g., passenger and freight as in the case of bellyhold freight or multiple consignments of varying density) and the proper methodology should help them alleviate these technical issues.

Data sharing lies at the heart of this exercise and is determined by the companies' ability to collect and analyse emissions data. In the early stages, shippers outsourcing their logistics have had to rely on a so-called activity-based approach to measuring carbon emissions based on ton-kilometre estimates of CO_2 emissions. Over time, ideally, one should move away from this approach towards an energy-based system of calculation where users and operators have access to the energy data. This would enable the shift from default industry averages towards company-specific data.

One important question, which has triggered significant debate recently, pertains to the delimitation of the boundaries of the logistics emission calculation. Firstly, organisational boundaries distinguish between direct emissions vs emissions outsourced to logistics providers, for example. The so-called activity boundaries differentiate between core activities and peripheral/ancillary activities. System boundaries, on the other hand, consider emissions from the vehicle operation, or so-called tank-to-wheel measurements, energy supply chain emissions, well-to-wheel, emissions from maintenance and servicing of freight vehicles, maintaining transport infrastructure, manufacture and scrappage of freight vehicles, and not the least, emissions linked to administration, IT, personnel. Lastly, the hierarchical boundary relates to the level at which one measures the freight-related emissions, i.e., at the corporate level or drilling down to the supply chain level for individual products.

A critical issue discussed was the level of disaggregation. A recent survey of carbon measurement capabilities in European logistics, which interviewed 90 European businesses, found that 15% of respondents did not measure logistics emissions at all. 25% of businesses claimed they were calculating their emissions at a disaggregated level and making data available for external use to their shareholders and customers. Another survey of 800 small and medium-sized European road companies showed more worrying results, whereby 43% of respondents claimed they did not have any measurement capabilities, whereas 32% were measuring emissions at the company level and only 25% at the customer level. These findings illustrate the still long journey ahead in getting SMEs to do carbon accounting more systemically.

There has been also growing pressure to undertake carbon accounting at the product level (e.g., eco-labelling products). Participants underlined that a multi-dimensional measurement of carbon emissions from logistics would be necessary to provide correct data and allow for standardisation across supply chains, industry sectors, commodities, and transport modes. While it is widely recognised that rail and inland waterways are much more environmentally friendly modes, participants pointed out that the road sector has seen an increasing focus on decarbonisation and the collection of data at a much more granular level to demonstrate environmental performance improvements. A similar change in terms of obtaining data to back up and demonstrate changes and report on a global basis across rail and inland waterway sectors has not been observed. Participants urged all modes to follow suit in making the step change in the data availability and provision to feed into the intermodal calculation (e.g., emissions per ton-kilometres).

Failure to upgrade the emission factors used for the different transport modes could hamper the ability to capture the environmental performance of transport modes over time. In view of this, the carbon accounting framework needs to be future-proof in terms of reflecting the continuous technological progress in the individual transport modes and operational practices. Here, the EcoTransIT calculation engine was presented as an example of the commonly used tools by forwarders, given that its calculation parameters enable differentiation between motorways, city and rural areas. The need for carbon calculations to be sufficiently detailed was highlighted in order to reflect strategic and management decisions (e.g., investments into Bio-LNG trucks).

There was a firm agreement among participants over the need for a common carbon accounting framework. They also underlined the importance of following a door-to-door approach (in the multimodal supply chain), and taking into account the CO_2 emissions not only from the transportation but also those related to handling, among others. Furthermore, besides comparing the carbon intensity of modes today, participants urged for modal split policies to be based on pro-

jections of future differentials in carbon intensity. Even if it is foreseen that a considerable share of road transport is to be electrified by 2030, there will still be a strong need for a modal shift, given uncertainties regarding the carbon intensity of the electricity production.

Efforts towards a common carbon accounting framework should preferably build on existing research projects and the Global Logistics Emissions Council (GLEC) Framework. The GLEC framework was considered to have promoted the standardisation of GHG emissions accounting methodologies and reporting standards, and in doing so, to have attracted a high degree of industry engagement. Participants agreed that GLEC offers the most suitable industry standard for the measurement of emissions available both in Europe and globally and therefore welcomed its substantial contribution to the ongoing work on the global ISO standard on the quantification and reporting of GHG emissions arising from operations of transport chains.

Notwithstanding, some participants underlined that the GLEC Framework would not disappear or diminish in importance once the new ISO standard has been published. On the contrary, it was argued that its relevance would become even more evident in supporting the implementation of the ISO standard for two main reasons. Firstly, the GLEC framework is a flexible mechanism that allows for updates of inputs, such as emission factors, emission intensities and other new developments, which cannot be easily picked up through the rigid ISO structures. Secondly, given the ISO standards technical wording, it would need to be accompanied by guidelines to assist companies in understanding and implementing the standard. The GLEC Framework already provides such guidelines, which enjoy a high degree of backing from the industry.

Participants also underlined the importance of ensuring alignment between EU regulations and the international regime to avoid excessive administrative burdens and double reporting obligations. Here reference was made to the maritime sector, covered by both the International Maritime Organisation's (IMO) Data Collection System (DCS) and the EU's Monitoring, Reporting and Verification (MRV) System. In light of this, the need for a harmonised global approach was welcomed as a means to keep the administrative burden for companies, and especially SMEs, to a minimum.

Collaboration was considered a critical factor in fostering a sector-wide uptake of carbon accounting practices. This can be achieved for instance by means of launching partnerships between original equipment manufacturers (OEMs), such as truck manufacturers, who dispose of large quantities of data. Thanks to telematics and black box technologies that trucks are equipped with, transport service providers can accurately calculate CO_2 emissions on a tank-to-wheel (TTW) basis and thereby also derive more accurate well-to-tank (WTT) emissions calculations. There is an apparent need for obligations to be put in place in view of resistance to share data. Participants welcomed a push from the side of the Commission in introducing data sharing obligations on truck manufacturers vis-à-vis customers. The provision of detailed information on the carbon footprint of specific services would increase transparency and help to inform purchase decisions while allowing for the aggregation and comparison of data between the different transport modes and companies. Here the need for interoperability and common approaches to data sharing and declaration structures was highlighted.

Surveys have shown that large numbers of companies do not measure CO_2 emissions from their operations. In supply chains, shippers and logistics service providers very often rely on the GHG emissions data provided by the transport operators. Therefore in order to enable accurate and consistent GHG performance reports from supply chains and networks, more emphasis should be put on carriers to measure their emissions. This may take the form of certain requirements (e.g., by setting CO_2 and other environmental metrics as the carrier selection criteria) and/or incentives (e.g., demonstrating benefits of CO_2 accounting as a measure supporting cost reduction and optimisation of transport operations within a company and across the value chain). Eventually, environmental accounting may also be aligned with financial reporting and integrated into the companies' balance sheets.

Looking at the greening of carbon operations more broadly, participants underlined the need for investments into zero and low emission fuels in all transport modes, not only as regards companies' own fleets but also as regards the entire supply chains, given the fact, that significant shares of operations (and related emissions) are being sub-contracted today. Further, greening best practices such as boosting the electrification of

first and last miles, and carbon-neutral designs for newly constructed buildings, were raised.

Looking ahead

Data lies at the core of both transport greening and modal shift. A better overview of operational data and environmental performance can enable further improvements and optimisation. There are various data collection and sharing systems on the market today, though these are not interoperable, making it impossible to share data between various actors operating in the supply chain, both on the B2B but also on the business-to-administration side. While companies, which measure and report their environmental performance stand to gain a clear competitive advantage, reliance on voluntary private initiatives entails the risk of delivering marginal results and of failing to meet set objectives. Environmental externalities, by definition, are 'outside' the market, and as such, need to be internalised through clear governmental rules and regulations, complemented by monitoring and follow-up where required. In view of this, participants welcomed the enactment of strong governmental steering, setting out the rules to ensure initiatives are centrally coordinated.

One of the tools considered to support GHG information exchange might be for instance the recent EU Regulation on electronic freight transport information (e-FTI Regulation) providing for a harmonised framework for business-to-administration cargo-related data sharing. The Commission intends to have the technical specifications for eFTI ready by 2023, which would then become applicable by August 2025.

Another relevant development in this field is the work of the Digital Transport and Logistics Forum (DTLF), concerning the establishment of a common freight data space based on a federated network of data sharing platforms. This concept aims to facilitate interoperable exchange of data in the logistics chain without imposing central solutions at the EU level, by providing a set of common rules, specific data sharing architecture and appropriate governance mechanism guaranteeing trust, security and level playing field between the actors. Not the least, the Commission is currently working on a so-called mobility data space, which would encompass all relevant digital policies in transport at the EU level, including freight and passenger sectors.

Greening freight transport: policy based on data, but policy!

A comment by Prof. Thierry Vanelslander, University of Antwerp

Policies for greening freight transport are not new. Already in the 90'ies, multimodality and intermodality were high on the European agenda. Heavy investments were made in additional infrastructure, price incentives (subsidies) were awarded, and regulation was established, among others, to separate rail network managers from operators. All these measures were without doubt conditions without which a substantial modal shift could not materialise.

However, this is not sufficient, witness the modal shift figures of the past two decades. Smooth operations in chains are needed. Connectivity, vertically as well as horizontally, needs to be strongly reinforced. Like with the internet, users (shippers) should in fact not care about all the modes and steps that are needed to bring goods from a point of origin to a point of destination: one touch on a button should ideally be sufficient to get the goods shipped. The concept is called Physical Internet. It uses Artificial Intelligence to make optimal use and combinations of information, which is collected in real-time through sensors and automated equipment. We are far from that situation still. Technically, it is not always easy to let different systems talk to each other. But more importantly, there is often a lack of trust or willingness to actually exchange information.

Therefore, it is good that governments and the European Commission, through its Framework Programs in the first place, have approved projects that combine technical system developments with attention for governance. It allows testing in concrete pilots and lets a thousand flowers blossom. The best ones are to make it then to the market, being uptaken by operators.

However, there are a number of risks. First of all, one risks ending up with a multitude of platforms that do not talk and work with each other, but in parallel to each other. 'The cloud' therefore risks materialising in multiple clouds, leaving the sky very cloudy and not achieving the objective of global exchange and connectivity. In fact, that hampers modal shift and keeps cargo within the own silo.

A further risk is that the most powerful players in chains, through the amounts they can invest in overarching systems, will make it at the expense of other, smaller players. One risks ending up with oligopolies or even monopolies. The latter are currently largely unregulated due to their global nature and the absence of a real regulator at global level. That again avoids that the different modalities get optimally combined.

The latter translates into an additional risk: geopolitics comes into play. In search of control of global supply chains, countries favour their own operators, so as to ensure that 'competing' nations cannot develop and conquer parts of the world. A race towards cheaper logistics solutions to enter markets without much incentive to internalise external costs emerges. That way, governments work in favour of their own logistics operators, rather than the latter in function of social welfare.

Another risk is that governments have a tendency to leave not only logistics operations but also governance framework development to private operators. Governments thereby omit their key task: to regulate in function of social welfare. Roles are what they are, and one cannot expect a private party with its own objectives (i.e., profit maximisation, shareholder returns increase, etc.) to act by itself fully in line with what society needs. Inherently, this brings a conflict of interests, in the first place, between public and private interests. Only governments, as elected public representation bodies, can represent societal interests. Governments should therefore take up that role, whether the regulation target is an SME or a large and 'powerful' multinational with big lobbying power.

That brings me to the last risk. Often, data seem to be confused. Of course, operational data are needed to make sure that – well-regulated – platforms and synchromodal systems can function. However, for policymaking, that level of data detail is not needed. Ultimately, using such operational data can help render policy-making more refined and agile. However, what is needed in the first place is higher-level data and even more synthesising indicators. Over the past decades, such data collection has been strongly reduced or even stopped, often for reasons of public budget cutting. The use of operational data available in online systems was often proposed as the perfect alternative. However, not only are such operational data of a different

nature than what is needed for policy purposes, but even worse, most often the data are private and not accessible to non-involved operators. How can one expect policymakers to have a view on the success of their modal shift actions if such higher-level indicators are not available? How can one take lessons for future modal shift policies if the results of past ones can hardly be evaluated? How can one identify barriers and obstacles, and suggest remedying actions, if such bottlenecks cannot be quantified? It largely seems as if policymakers are sailing blindly, and the history of transport has shown that doing so only leads to more accidents, but not at all to the best transport solutions. Up to governments to embrace this key public competence again!

Boosting the Share of Intermodal Transport: A Roadmap for reaching the European Green Deal Objectives

A comment by Irmtraut Tonndorf, Hupac

Can we double rail freight until 2050, as requested by the EU Green Deal? From an intermodal operator's perspective, we can easily meet and even exceed this target. Intermodal transport has grown by 50% in the decade from 2009 to 2018. We can definitely go for more and offer a much more substantial contribution to decarbonisation. This requires, however, coordinated action between different stakeholders on the European and national level from policymakers to infrastructure managers, railway undertakings and intermodal operators.

Enabling regulatory framework

Combined transport bundles the advantages of road and rail, but for historical reasons linked to the enormous growth of the automotive sector since the second world war, rail is currently suffering from significant structural deficits. In order to ensure a fair level playing field between rail and road, the following measures need to be implemented.

- *Reduction of differences in internalisation of external costs:* Road freight causes about six times higher external costs than rail freight. So far, this discrepancy has not been adequately addressed. Therefore, policymakers should establish a regulatory framework that is based on the 'polluter pays principle'.
- *Reduction of Track Access Charges (TACs):* While TACs were waived in 2020 due to the COVID-19 pandemic by some EU Member States for a certain period, their consistent waiver should be considered on a European level as long as the road tolling schemes are not up to par. Such a waiver would enforce conformity between the modes of transport (road and waterways are subject to tolls only in some European states) and ensure a positive impact on rail freight's competitiveness.
- *Revision of passenger priority rules:* Passenger trains are prioritised over freight trains in all European countries – a circumstance that does not apply to road transport. This leads to shortfalls in efficiency, flexibility, quality and capacity. Therefore, it is necessary to revise the passenger priority rules on a European level to establish a homogenous regulatory framework where rail freight transport can grow in interaction with passenger transport.
- *Reduction of access barriers to intermodal transport:* While containers are perfectly intermodal and can be easily transferred from road to rail and vice versa, swap-bodies and mainly semi-trailers, the dominant loading unit type in continental traffic, require special equipment to be transferred on trains. With few technical arrangements, semi-trailers can be made craneable and therefore access standard intermodal transport without technical obstacles. Policymakers should make sure that craneability becomes standard for semi-trailers within a reasonable time. In the meantime, the retrofitting of today's non-craneable semi-trailers should be subsidised.
- *Establishment of an open data policy:* We need to regulate the establishment of an open data policy involving infrastructure managers, railway undertakings, combined transport operators and logistics service providers. Relevant data must be collected by any participant in combined transport and shared to ensure transparency and collaboration. The regulation of an open data policy and the support of industry standards such as EDIGES contribute to achieving these gains.

Enhancing customer-driven physical infrastructure

No combined transport without adequate physical infrastructure! The specific requirements of freight transport need to be considered in all phases such as network planning, building and operations, with special attention to the predominantly international dimension of freight traffic. The following measures are crucial for higher productivity and quality of combined transport.

- *Upgrade of existing infrastructure:* For combined transport to grow above average, we need to foresee consistent investments into the physical infrastructure. In order to increase productivity and to achieve the desired modal shift, the European rail

network needs to be upgraded to the P400 loading gauge – fit for the 4-meter height of semi-trailers – and a train length of 740 meters. In the meantime, a temporary compensation for the lost productivity due to the "underlength" of trains should be considered. In addition, bottlenecks need to be eliminated, additional high-quality capacity and redundancies are to be created, rail freight corridors must be interconnected for better network effects, and parking tracks need to be available in sufficient quantity.

- *Supplement of terminal capacity:* Decision-makers also need to invest in the terminal infrastructure to create access for freight to the rail network – a prerequisite for further combined transport growth.
- *Standardisation of technical rules and specifications:* Combined transport can grow supranationally if the networks are harmonised and national specificities are abolished. So far, locomotives and drivers often have to be exchanged at borders due to different standards and requirements in many countries. Hence, it is necessary to overcome these burdens by standardisation across Europe. The European Railway Agency needs to be strengthened, and the roll-out of the European Railway Train Management System for the entire rail network should be consistently implemented.

The innovation potential of politics

The future success of intermodal transport lies in the hands of today's policymakers. The European Green Deal sets the stage for numerous regulatory reviews – a huge opportunity for strengthening and enhancing combined transport within Europe. The following legislative processes are crucial and require a coordinated effort – let us take the opportunity to lay the foundation for the growth we are striving for!

- *Review of TEN-T Guidelines Regulation*
- *Review of Rail Freight Corridor Regulation*
- *Revision of the Energy Taxation Directive*
- *Revision of the Combined Transport Directive*
- *Revision of the Weights and Dimensions Directive*
- *EU road haulage rules in Combined Transport.*

A Progress Report on the Measurement of European Freight Transport Emissions

A comment by Prof. Alan McKinnon, Kuehne Logistics University

The old business maxim that 'if you don't measure it, you can't manage it' applies as much to freight transport emissions as to any other business metric. Users and providers of freight services need to know how much CO_2 they are emitting to be able to set and deliver carbon reduction targets.

Over the past 15 years, substantial progress has been made in the measurement and reporting of carbon emissions from the movement of cargo. The subject has generated a large literature of reports and journal papers and attracted the attention of a host of organisations keen to give their members advice on carbon footprinting. The techniques for measuring emissions have been refined, new online tools, most notably EcoTransIT, have been developed to facilitate the process, and there has been much greater harmonisation of methodologies, particularly with the wide adoption of the EN 16258 standard and the Global Logistics Emissions Council (GLEC) framework.

The proportion of businesses measuring their freight emissions has also been increasing, though in some parts of the freight market still falls well short of 100%. Two recent European surveys have indicated the current extent of emission measurement in the logistics sector. The first survey of around 90 businesses found that 89% of larger logistics providers and 83% of shippers (i.e. cargo owners) were measuring these emissions, the former demonstrating a much greater capability to disaggregate the data and make it available externally. In the second survey, only 43% of 800 small and medium-sized road carriers claimed to be able to measure their emissions.

Taken together, these survey results provide an overview of what might be called the chain of emission measurement in the logistics sector. In Europe, shippers outsource most of their freight transport to logistics providers, many of whom in turn sub-contract much of the work to small carriers. At both levels in this 'chain', outsourcing of the activity should effectively transfer responsibility for the measurement of related emissions. It is, after all, the company operating the assets and burning the fuel that can apply the more accurate 'energy-based approach' to emission measurement. Where carriers and/or logistics providers are unable or unwilling to supply the emissions data, the chain is broken, and shippers left with little choice but to use the inferior 'activity-based approach' to calculating freight emissions, using tonne-km data and industry-average carbon intensity values.

There clearly needs to be greater collection and sharing of freight emission data across the supply chain, though this is difficult to achieve, partly because of the nature and structure of the road haulage industry. The European industry, which handled 76% of EU inland freight tonne-kms in 2019, is highly fragmented, comprising over half a million small carriers locked in intense competition and typically earning small profit margins. Incentivising or requiring such an enormous population of carriers to carbon footprint their operations, particularly at a client or consignment level, is a major challenge. It can be made a legal obligation, though experience in France casts doubt on the effectiveness of this approach. The procurement procedures of shippers and larger logistics providers can exert stronger pressure on carriers to disclose emission data, though usually fail to do so. Carriers often offer as an excuse for not collecting CO_2 data that their clients seldom ask for it. Some carriers also fear that divulging commercially-sensitive fuel-related data might weaken their negotiating position and exert downward pressure on freight rates. Such fears must be allayed in the pursuit of low carbon logistics.

Vehicle manufacturers also have a role to play in improving the carbon transparency of road freight operations. It is often claimed that they capture fuel consumption data from trucks they have sold to monitor their ongoing performance, though do not routinely share it with operators. They could make this data more widely available and give operators more guidance on the measurement and management of fuel consumption and emissions.

Looking to the future, carbon accounting in the freight sector is also likely to be enhanced in other ways. The 'system boundary', within which emissions are calculated, will be extended from tank-to-wheel (TtW) to well-to-wheel (WtW) estimates and beyond that to embrace embodied emissions in the vehicles and infrastructure as

well as those associated with administration and IT. Only when the carbon auditing system is truly holistic will it be possible, for example, to determine the net GHG savings from freight modal shift, particularly where this involves expanding the infrastructural capacity of rail and inland waterway networks. The granularity of freight carbon measurement will also have to increase to give analysts the disaggregated data they will need for the eco-labelling of products, last-mile delivery options, recycling services etc. More granular data will also allow businesses and public policy-makers to track with greater accuracy incremental improvements in the carbon efficiency of freight transport operations. At present, such improvements can be hard to detect because of over-reliance on industry-default values of carbon intensity and a failure to regularly recalibrate emission factors in line with technology advances and improvements in business practice.

One of the central goals of freight carbon accounting has been to produce estimates that are consistent, transparent and comparable across transport modes, operators, commodities, supply chains and geographies. As the collection of freight emission data is refined, digitalised and innovated in other ways, we must ensure that this drive for consistency, transparency and comparability is strongly maintained.

FSR Transport

The Florence School of Regulation (FSR) is a project within the European University Institute (EUI) focusing on regulatory topics. It works closely with the European Commission, and is a growing point of reference for regulatory theory and practice. It covers four areas: Communications and Media, Energy (Electricity and Gas), Transport, and Water.
The FSR-Transport Area's main activities are the European Transport Regulation Forums, which address policy and regulatory topics in different transport sectors. They bring relevant stakeholders together to analyse and reflect upon the latest developments and important regulatory issues in the European transport sector. These Forums inspire the comments gathered in this European Transport Regulation Observer. Complete information on our activities can be found online at: fsr.eui.eu

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