FOSTERING THE RAILWAY SECTOR THROUGH THE EUROPEAN GREEN DEAL

REPORT
Part 2 - Freight

EUROPEAN UNION AGENCY FOR RAILWAYS

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Making the railway system
work better for society.

Report

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EXECUTIVE SUMMARY

At the peak of the Covid-19 crisis in April 2020, the estimated decrease in daily fossil CO_2 emissions due to global confinement was -17%. While the Greenhouse gas (GHG) emissions kept increasing in 2019, the CO2 emissions decreased by about 6% in 2020 due to the economic activities' loss with the Covid-19 crisis. It will take an annual emission reduction of exactly this magnitude to limit climate change to a 1.5 °C warming over the next decades. These figures show ***how challenging it will be to reach the climate goals of the Paris Climate Agreement*** *and the decarbonisation targets of the European Green Deal. Furthermore, most changes observed during the crisis do not reflect structural changes in the economic, transport or energy systems. Surface transport, being the second most emitting sector in the EU, accounts for nearly half the decrease in emissions during confinement. It is the one of the key sectors for reaching both the EU targets and the Paris Agreement objectives.*

The European Commission has built a strategy for sustainable and smart mobility at the end of 2020 in which it sets objective to double rail freight traffic by 2050. Although freight traffic has increased significantly in the past few decades, this increase was mostly true for the road sector. Indeed, rail freight showed an annual average increase of 4.1% between 2015 and 2018 but its modal share decreased from 18.8 to 18.7%.

In its first report, ERA presented a strategy for a rail renaissance aiming at making it the backbone of mobility over the next 30 years. In this contribution, ERA advances six clusters of measures to promote rail freight and to develop reliable and seamless connections which should eventually help reaching the ambitious European policy goals. These are:

- **➔ to attract more private investments by ensuring a level playing field for all transport modes;**
- **➔ to take full advantage of technological developments;**
- **➔ to develop a green logistic chain through a multimodal strategy;**
- **➔ to be more market-oriented by facilitating the access to the rail offer;**
- **➔ to put the customer as the central focus; and**
- **➔ to increase leadership by building a global vision of the logistics' chain impact.**

This report by the European Union Agency for Railways aspires to contribute to the forthcoming Measures to increase and better manage the capacity of railways of the European Commission.

INTRODUCTION

Political goals

In a communication from December 2019[1], the European Commission developed a global and intersector roadmap to reach environmental targets and to "turn an urgent challenge into a unique opportunity". The main aim of the European Green Deal is to transform our economy and society to engage it towards a sustainable path. This will require a massive public investment programme together with major efforts to direct private capital towards climate and environmental action. The Green Deal is composed of various elements going from "a zero pollution ambition for a toxic-free environment" to "mobilizing industry for a clean and circular economy". The strategic element for the railway sector is named "**accelerating the shift to sustainable and smart mobility**". The European Commission has developed a strategy for sustainable and smart mobility at the end of 2020[2].

In addition, it is also clearly stated that a modal shift shall be privileged for freight transportation as today 75% of inland freight is carried by road while a substantial part of goods should shift towards rail and inland waterways. In the aforementioned strategy, the objective is set to double rail freight traffic by 2050 meaning from approximately 385 billion tkm[3] transported by rail in 2015 to 770 billion tkm in 2050 with an intermediate step to transport 575 billion tkm by 2030 (+50% in rail freight traffic) while 455 billion tkm transported by rail in 2019.

sustainable and smart mobility ——— **increase and better manage the capacity of railways**

This objective has been supported at political level in the Ministerial Declaration "Rail Freight Corridors: The Future of Rail Freight in Europe" during the Ministerial Conference on "Innovative Rail Transport – connecting, sustainable, digital" in Berlin on 21st September 2020 (the so-called "Berlin declaration"[4]). In this declaration, the Transport Ministers committed to:

- Further strengthen and develop the rail freight corridors;

[1] https://eur-lex.europa.eu/legal-content/EN?uri=/TXT/?qid=1588580774040&uri=CELEX%3A52019DC0640
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789
[3] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Rail_freight_transport_for_main_undertakings,_EU-27,_2006-2019_(billion_tonne-kilometres).png
[4] https://www.bmvi.de/SharedDocs/EN/Documents/K/innovative-rail-transport-21-09-2020.pdf?__blob=publicationFile

- Support rail freight stakeholders to better adapt to market needs;
- Enhance rail freight transport as one of the most environmental friendly way of moving freight;
- Further develop technical and operational harmonization;
- Ensure attractiveness to skilled workers.

This message was further repeated in the "Joint position paper Call for the EU Commission to launch an initiative in favour of rail freight operators to promote modal shift towards clean transports"[5] signed by 16 Members States in March 2021. Those Member States expressed their views that rail freight industry should not only be dealt with at the national level through various State aid regimes in each Member State. On the contrary, they consider that Europe must fully take up onboard the issue of both regulatory and financial support to rail freight. The EU Commission has been called to quickly launch a study on the Union schemes to support rail operators, notably rail freight operators with the view to achieve a concrete modal shift from road towards rail transport, and how to migrate towards more innovative and competitive concepts like digital automatic coupling.

State of play

These political goals are challenging to achieve and this is explained by recent trends. Although freight traffic has increased significantly in the past few decades, this increase was mostly true for the road sector. This growth is associated with high environmental pollution and external costs for our society. Most recently, around 1.900 billion ton-kilometers were transported on Europe's roads, representing almost five times as much as by rail. The 21% growth on the road was almost twice as high as on the rail, at 12%[6]. Hence, although rail freight showed an annual average increase of 4.1% between 2015 and 2018, the modal share decreased from 18.8 to 18.7%[7]. While the Greenhouse gas (GHG) emissions kept increasing in 2019, the CO_2 emissions decreased by about 6% in 2020 due to the economic activities' loss with the Covid-19 crisis[8]. Despite this, the impact of transport on environment and society is still very high as it represents around 25% of Europe's emissions for which the freight sector represents 30% of total transport sector emissions, while passenger traffic (mainly private cars) accounts for the remaining 70%.
According to some recent studies, the transport sector is one of the most impacted sector by the Covid-19 crisis and has the largest reduction in its CO_2 emissions. Today rail is the most

[5] https://www.ecologie.gouv.fr/sites/default/files/20210330_Joint_Position_Paper.pdf
[6] https://vcoe.at/gueterverkehr
[7] https://ec.europa.eu/transport/sites/transport/files/com20210005-7th-rmms-report.pdf
[8] https://www.iea.org/news/after-steep-drop-in-early-2020-global-carbon-dioxide-emissions-have-rebounded-strongly

sustainable mass mode of transport. Therefore, increasing the modal share of rail freight in the short term is fundamental to win the battle against climate change. Indeed, rail freight transport, despite increasing volumes of transport, have seen its CO_2 emissions and energy consumption falling by almost a third in twenty years[9] while all the other modes of transport have seen their emissions increasing[10].

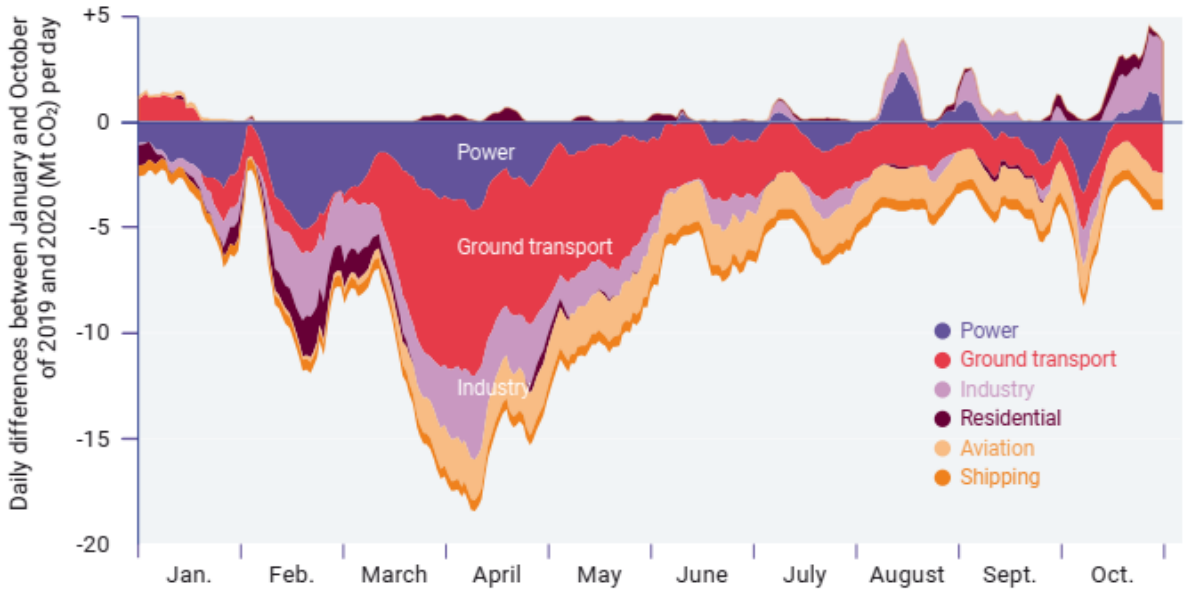

Figure 1: Reduction in emissions in 2020 relative to 2019 levels due to Covid-19 lockdowns - United Nations – Environment programme (UNEP)

The railway sector has also demonstrated throughout the Covid-19 crisis its resilience and adaptability to the new situation. The freight sector has been particularly key in transporting goods when some internal EU borders were closed[11] and transportation by road or air was not always possible. Despite this increased competitiveness of the freight railway sector in a period of crisis, it still needs to improve in multiple areas in order to make this modal shift possible.

Way forward

In order to reach this objective, the European Commission should propose additional "**Measures to increase and better manage the capacity of railways"** and inland waterways by 2021.

[9] https://www.vdv.de/vdv-mit-bahnen-und-bussen-in-die-zukunft-input-zur-eu-mobilitaetsstrategie.pdfx?forced=true

[10] https://op.europa.eu/en/publication-detail/-/publication/9781f65f-8448-11ea-bf12-01aa75ed71a1

[11] https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/transportation-during-pandemic_en

Following ERA's first report on "Fostering the railway sector through the European Green Deal"[12] published in July 2020 as a contribution to the sustainable and smart mobility strategy, the European Union Agency for Railways (ERA) aspires to contribute also to the forthcoming "**Measures to increase and better manage the capacity of railways**". In its first report, ERA presented a strategy for a rail renaissance aiming at making it the backbone of mobility over the next 30 years. In this contribution, ERA advances six clusters of measures to promote rail freight and to develop reliable and seamless connections which should eventually help reaching the ambitious European policy goals. These are:

- ➔ **to attract more private investments by ensuring a level playing field for all transport modes;**
- ➔ **to take full advantage of technological developments;**
- ➔ **to develop a green logistic chain through a multimodal strategy;**
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- ➔ **to put the customer as the central focus; and**
- ➔ **to increase leadership by building a global vision of the logistics' chain impact.**

Figure 2: the six key factors to increase and better manage railway capacities

[12] https://www.era.europa.eu/sites/default/files/events-news/docs/fostering_railway_sector_through_european_green_deal_en.pdf

I. A level playing field for all transport modes

➔ Achieving a fair and mode-neutral regulatory environment

In the transportation of freight, the main competitor to rail is the road sector. It is important to mention that rail suffers from a serious disadvantage compared to road transport as rail transport covers for the major part of the external costs it causes, which is considerably less the case for road transport[13]. The issue of road pricing and its contribution to the decarbonisation of transport and the shift to more sustainable transport was recognized in the Commission's 2011 white paper on transport[14]. This white paper already called for a move towards full application of “user pays” and “polluter pays” principles as a mean to achieve a level playing field in the competition between modes of transport. Despite the fact that this is known for long now, those principles are currently still applied inconsistently. In 2017, road transport was responsible for 17% of the EU's CO_2 emissions[15]. There is thus an urgent need of **internalising environmental costs** for all transport modes which would be a policy eventually favoring rail transport.

There is already Directive 1999/62/EC[16] which is introducing road pricing principles but this so-called “Eurovignette Directive” does not oblige Member States to introduce user charges and leaves some room for interpretation on road charging methods. Member States are thus free to decide if they want to implement road charges, on which part of their road network, and to what extent they want to recover the costs of infrastructure. For railways, on the contrary, RUs are always paying for the use of the infrastructure[17]. While a majority of Member States have implemented some sort of road charges, only a minority apply distance-based charges to heavy good vehicles (HGV) and only a few of them to passenger cars (which are not covered by the existing EU legislation). The possibility of exempting vehicles between 3.5 and 12 tons also leads to an uneven playing field in freight transport. In addition, the application of charges to buses, coaches, vans and passenger cars is outside the scope of the current legislation and left to Members States' discretion. It leads to a situation where road charging is primarily focused on HGV in most Member States and does not reflect the 'user pays' and 'polluter pays' principles for all road users. Furthermore, only a very limited number of Member States introduced time-varying charges to actually deal with congestion. Finally, the current Directive does not cover CO_2

[13] https://op.europa.eu/en/publication-detail/-/publication/0efedf2c-a386-11e9-9d01-01aa75ed71a1
[14] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52011DC0144
[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2017:0181:FIN
[16] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31999L0062
[17] Track access charges have been lifted or reduced in some Member States with the Covid-19 crisis.

emissions, although it addresses other externalities such as air pollution and noise. Road pricing could also have an impact in this field by incentivizing renewal of the vehicle fleet.

In the current negotiations on the different programmes, the European Commission has a potential lever to direct the attention of Member States to rail transport. Considering the urgent environmental objectives, it would be difficult for Member States to argue a continuation of a dominance of funding for conventional road transport. In this context, the proposal of revision is to make progress in the application of the "polluter pays" and "user pays" principles. The first main change proposed relates to the scope of application of the rules on tolls and user charges. It would be extended to cover not only HGV but all heavy duty vehicles (HDV) and light duty vehicles (LDV), i.e. in addition to the goods vehicles over the 3.5-tons limit, the directive would encompass passenger cars, minibuses and vans, as well as coaches and buses. The proposal would make progress in the application of the 'polluter pays' and 'user pays' principles by gradually phasing out the use of time-based user charges (vignettes) first, for HGVs and buses and coaches (until 31 December 2023) and then for passenger cars and vans (until 31 December 2027). The purpose would be thus to gradually replace time-based user charges with distance-based charges, which are considered fairer, more efficient and more effective. The European Commission text also proposes to allow the application of congestion charges, on top of infrastructure charges, to address the issue of interurban congestion.

Concerning the legislative process[18], the final compromise proposal from the German Presidency was published on 10th December 2020. In the adopted text, the Council maintained the possibility for the use of time-based charging (vignettes) and gave Member States the possibility to choose between a time-based and distance-based charging model. The main change was the introduction of a new provision asking Member States to modulate infrastructure and user charges of HDVs according to CO_2 emissions. Member States would also be able to continue applying charge variation depending on the vehicle's Euro emission class. Lastly, the Council agreed with the proposal allowing Member States to apply higher mark-ups (up to 50 %) to the infrastructure charge levied on highly congested road sections if a prior agreement was reached with all affected Member States. On 29th January 2021, Parliament and Council delegations met for their first interinstitutional negotiations. The main points of contention concern the possibilities given by the Council to Member States to continue to apply user charges (vignettes) for HGVs and to extend the exemptions for HGVs below 12 tons from road charging for 8 additional years. Moreover, the Parliament wishes to impose external costs charges to all

[18] https://www.europarl.europa.eu/RegData/etudes/BRIE/2017/614625/EPRS_BRI(2017)614625_EN.pdf

categories of vehicles as from 2026, while the Council would do so on more limited categories of vehicles and on specific sections of the road network.

Road pricing is even more important today as the policy to renew the passenger cars fleet will create a situation where most people will own low emission vehicles impacting the taxes on motoring which will be then very limited. Any new tax will be more difficult to accept for citizens as there will be no possibility to introduce alternative compensatory measures. Indeed, road pricing is not only about ensuring a level playing field between modes of transport but it is also about mitigating the risk that existing motoring taxes are allowed to fade away without anything replacing them. So that the **introduction of road pricing today is critical**. Indeed, although **battery electric vehicles (BEV) are more environmentally-friendly than conventional ones, they are much less energy-efficient than public transport and especially, rail transport**. Moreover, BEV can create an adverse effect on road congestion which is already very bad in several European cities and key highway sections. Recent history in various Member States shows that road pricing is not easy to implement. However, current developments also demonstrate that road pricing is an idea whose time has come taking into account the resilience of rail against other modes of transport, the space cities are starting to dedicate to active modes of transport (cycling, walking) with the Covid-19 crisis and the necessity to empower public transport in the battle against climate change.

➔ Investing strategically on lines

The EU's multiannual financial framework (MFF) for 2021-2027 together with the Next Generation EU recovery instrument will allow the EU to provide an unprecedented €1.8 trillion of funding over the coming years to support recovery from the Covid-19 pandemic and the EU's long-term priorities across different policy areas. Those EU funding will also be directed to invest in transport projects. However, the funding analysis is in response to Member States' proposals not an EU level strategic reflection. The EU needs an overall view with strategic EU priorities, especially as delivery times to answer call for projects are often too short for railway projects. Finally, environmental benefits should be properly weighted in the review projects' funding evaluation criteria. In a report from 2018[19], the European Court of Auditors pointed out that since 2000, the EU has been investing €23.7 billion into high speed rail infrastructure without a long term EU plan for high speed rail. The EU funds should be assigned in relation to **strategic priority projects** e.g. missing and congested cross-border links, rail connections to ports, ERTMS, longer and heavier trains, transshipments facilities and terminals.

[19] https://www.eca.europa.eu/Lists/ECADocuments/SR18_19/SR_HIGH_SPEED_RAIL_EN.pdf

In addition to EU and national public funding, a more efficient business model concerning private investments should be established in order to promote also better and faster planning. This is of particular importance to make sure that companies who wish to transport goods by rail have a freight yard nearby. Indeed, **co-financing transshipments facilities** (including private railway sidings, rail hubs, terminals, marshaling yards) is an important aspect to consider for the strategy of modal shift from road to rail, especially in revitalizing single wagonload market. Public authorities are regularly investing in business industrial parks with the necessary road infrastructure. The railway infrastructure to industrial sites should also be incorporated in those economic development projects. Indeed, increasing the connection of rail with the other transport modes will increase the attractiveness of rail which eventually should lead to a modal shift.

Barilla Group experience

Barilla Group employs a bit less than 8.500 persons and operates in more than 100 countries, with 30 production sites. Primarily renowned for its pasta, Barilla also sells sauces and bakery products around the world. As part of its sustainability Mission, the Group is committed to reducing the amount of products transported by road and switching to means of transport which have a lower environmental impact[20].

For this reason, in 2015 Barilla decided to invest and build a dedicated 2,4 km railway transport system in its production site in Parma, Italy. In this site, the largest pasta plant in the world, 300.000 tons of wheat, purchased from national producers and imported from abroad, are turned into semolina for pasta production, which represent approximately half of the 700.000 ton milling capacity of Italy and around 25% of the world's total milling capacity of 1.2M tons of wheat milled into semolina. A 30% of this wheat (approximately 100,000 tons) that is used in Parma is transported by train in two different ways. The wheat is imported predominantly from the USA, Australia and France. For the French wheat, there are direct trains from France when there are railway yards on the French side. For the extra-EU countries, they are first shipped to the port of Ravenna and are then transported by train directly to the site in Parma thanks to the construction of the railway yard. There are two 20-car trains per week to Parma that is roughly 200 km from the port of Ravenna. This Road-to-Rail strategy was designed in conjunction with the mill wheat storage capacity increase from 20.000 tons to

[20] For further information on Barilla and its sustainability path, further information is available on www.barillagroup.com

80.000 tons. This strategy has led to an important reduction in GHG emissions (-94,4% of CO2 emission) with the shift of approximately 4.200 trucks from the road to the rail per year.
Barilla is also transporting the final product on rail but with a different strategy than for the wheat since here the combined transport is mostly chosen either by shuttle train with Multi Transport Operator (MTO) or by project from railway undertaking. For instance, the flow from Parma to Germany represents 6.000 to 6.500 full load trucks (FTL)/year. Since March 2020, 75% of this flow is operated through an intermodal solution. Indeed, the first 19 km of transport are done by road from Parma to the freight terminal of Parma, then the main part to Germany is done by rail until the terminal container near Ulm and the last 13 km to Ulm are done by road. Every 2h a truck leaves the site of Parma to the freight terminal where the load is transferred on the train and every 2 days the train leaves with 16 wagons and 32 containers of which at least 27 are reserved for Barilla while the MTO is able to sell the remaining 5 containers. This transport modality is not necessarily more cost-effective. However, it is more sustainable and much safer. In addition, considering the negative trends in the road transport with more congestion, lack of truck drivers, reductions in road capacities and road speed (decrease from an average of 60 km/h to 50km/h in recent years, it was considered the most efficient solution.

II. Modern railways using the most recent innovations

➔ Decarbonising the last segments of the railway network

While most of the sectors have managed to reduce their emissions over time, the transport sector has increased them mostly due to a growth in the transport volume. More dramatically, the road transportation has increased its emission by 170 Mt CO_2e between 1990 (+26,8%) and 2017, 89 Mt CO_2e for international aviation (+147,7%) and 35 Mt CO_2e for international navigation (+35,9%). The railway direct emissions have declined by 66% in this same period due to the fast electrification of the railway network. In the end, the emission of greenhouse gas by rail transportation can be considered marginal as it represents less than 0.5% of the direct emission produced by the transport sector.

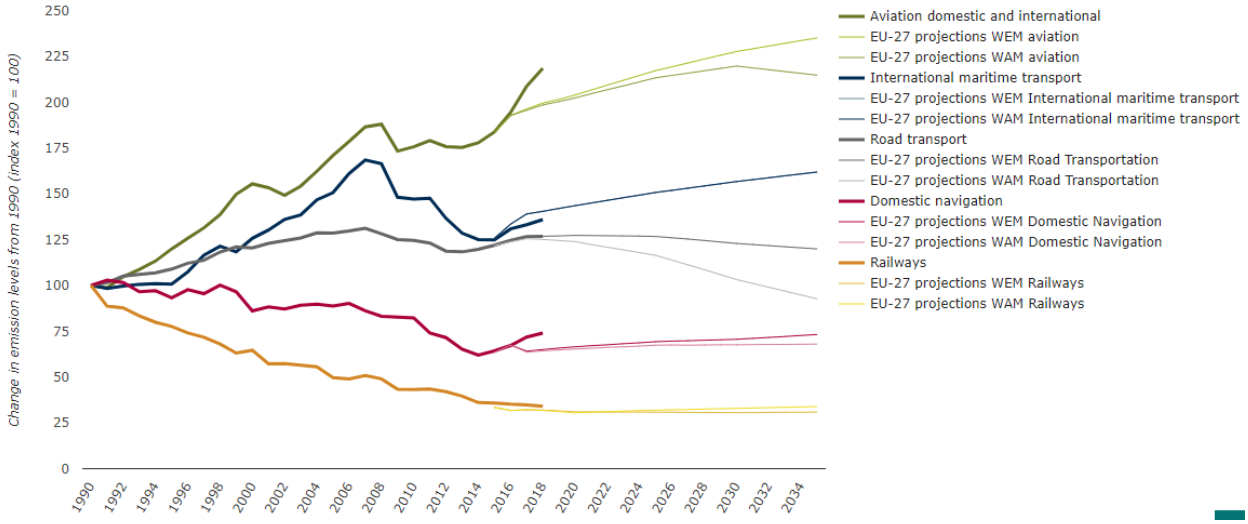

Figure 3: Greenhouse gas emissions from transport in the EU, by transport mode and scenario (EEA, December 2020)

The total length of the EU27 rail network in 2018 was around 201 000 line kilometers (0.4% less than in 2015), around 56% of which was electrified[21] (+855km since 2015, +1.2%) while around 80% of the whole traffic is running on those electrified lines[22]. The electrification of the European rail network will continue over the decades to come. However, it might not be economically sound to electrify some of the missing parts of the railway network, especially low-density lines and for shunting movements. Considering this economic constraint, it is necessary to find alternative solutions to the decarbonisation of those segments of the rail market and to shift towards zero direct emissions for this sector. Two solutions have proven their potential to achieve these objectives: the fuel cell and hydrogen technology on one hand and battery-powered locomotive on the other hand.

Latest studies show that fuel cell and hydrogen trains offer good technical performance with similar flexibility and versatility to diesel-powered fleets. They also make economic sense on non-electrified routes of over 100 kilometers for regional passenger transport, on main line routes with low density and on last-mile delivery routes. Ambitious plans already exist to foster the deployment of hydrogen train in the years to come, especially in Germany and France.

[21] https://ec.europa.eu/transport/sites/transport/files/com20210005-7th-rmms-report.pdf
[22] https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=34588&no=1

In a communication from July 2020, the Commission presented a hydrogen strategy for a climate neutral Europe[23]. From 2025 to 2030, hydrogen needs to become an intrinsic part of an integrated energy system. Renewable hydrogen is expected to gradually become cost competitive and dedicated demand side policies will be needed for industrial demand to gradually include new applications for rail transport. In this strategy, it is clearly specified that "hydrogen refueling stations can easily be supplied by regional or local electrolysers, but their deployment will need to build on clear analysis of fleet demand and different requirements for light- and heavy-duty vehicles". It means that the railway sector needs to identify today with the support of local and regional authorities the segments of the network were the use of hydrogen would be beneficial on one hand and help decarbonizing the railway transport on the other hand.

Hydrogen and battery electric rolling stock would allow the elimination of remaining diesel operations. Such alternative fuels powered trains, whose development is supported by Shift2Rail Joint Undertaking and Fuel Cells and Hydrogen Joint Undertaking (FCH JU), can bring rail to zero direct CO_2 emissions, decrease air pollution, and improve rail's multimodal performances (hybrid locomotives can switch from an electrified line to a terminal eliminating the need for additional shunting locomotives). In a study made by Roland Berger consulting firm[24], it is estimated that FCH-powered multiple units – currently the most market-ready application – could replace 30% of diesel volumes by 2030 in a base-case scenario.

Finally, both hydrogen and batteries need electricity to be produced somewhere. Even if this production can be "green" (wind, solar, etc.), clean electricity is for the time being a very scarce resource. For example, if an energy system where a given amount is produced by zero emission technologies and the rest is produced by burning coal, every additional kWh produced will have the emission factor of burning coal. Therefore, it is important to use as little electricity as possible, and **rail is more energy efficient than any other mode of mass transport**. Consequently, promoting transport by less energy demanding transport means will allow to decarbonise the energy production earlier as less energy will be needed.

[23] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0301

[24] https://www.rolandberger.com/ru/Insights/Publications/Fuel-cell-and-hydrogen-trains-An-ultra-green-revolution-for-Europe's-railroads.html

➔ Modernising the railways through technology

Digitalisation has the potential to **increase infrastructure capacity**, between 20% and 50% depending on the traffic type and signalling used. Among the induced benefits, aside the higher share of railways and the avoided greenhouse gas emissions, savings from avoided infrastructure investments shall also be considered and quantified. Modern signalling systems can really improve the performance of the railway sector. In addition, the national legacy control systems are incompatible (the patchwork effect due to the lack of coordinated strategy) and it constitutes a significant barrier for having a seamless traffic. ERTMS ("European Rail Traffic Management System") is a major industrial project being implemented by the European Union, a core industrial project which will serve to make rail transport safer, more competitive and increase the level of integration of the European railway system. This common European standard and its deployment will provide the backbone for a digital railway system and the main factor to achieve the Single European Rail Area.

Replacing legacy technology with an advanced train-control and signaling system—such as ERTMS level 2 and above, which uses wireless communications to supervise train movement—is a core element of the digitalisation of train control and traffic management. Whereas today's systems might have 100 to more than 1000 mechanical and electrical signal boxes, those will be replaced with new, digital interlocking and control centers, only a few of which are required to control even the largest rail systems. ERTMS should also bring advantages from avoiding change of locos, re-training staff and lower costs because of larger equipment market. Within the next ten years, these digital advancements will also allow operators to withdraw most of their trackside equipment, and autonomous train operations will be based on a digital rail infrastructure[25]. Infrastructure Managers and Railway undertakings will benefit from much more efficient operations and maintenance. In addition, the lower costs may result in reduced track access charges, from which the train operators will profit. As soon as digital train control and traffic management are introduced, the rail system's availability, reliability, and punctuality will increase.

ERTMS should also foster the innovation in the rail sector. On the 5th of January 2017, the European Commission adopted an Implementing Regulation setting the new ERTMS European

[25] https://www.mckinsey.com/featured-insights/europe/digitizing-europes-railways-a-call-to-action?cid=other-eml-alt-mip-mck&hdpid=a94f5c6b-cdc6-42f9-a6e4-73640083c1da&hctky=9139535&hlkid=d84b7839f0644e6cbd79299c055be92d

Deployment Plan (EDP)[26]. The EDP provides for about 40% of the Core Network Corridors to be equipped by ETCS by 2023 (15 672 km). However, this objective will be difficult to achieve. Indeed, although ERTMS is vital for an efficient European railway system as it can increase capacity by 30 to 40%, in April 2020 only 12% of the core network corridors were in operation with ETCS (i.e. 6 120 km) and 63% of the core network corridors with GSM-R[27]. It is important to notice that track-side equipment can be reduced by up to 70% with the latest version of ERTMS, with important savings on renewal, maintenance and fostered reliability. The deployment of ERTMS shall be firmly accelerated together with the specifications, development and demonstration of ERTMS game changers. Finally, ERA shall act as a strong system authority for ERTMS, also with the aim of protecting investments through improved modularity.

This capacity increase can be further improved together with energy savings with **Automatic Train Operation (ATO).** Coupled with lighter trains and higher loading factor, ATO can lead to energy savings between 20% and 50%. Also, ATO coupled with ERTMS/ETCS deployment, will reduce operating costs for railway undertakings and maintenance costs for infrastructure managers, while further improving punctuality. Investing in this technology is fundamental to make the rail renaissance a success.

Together with ATO and ERTMS, **Digital Automatic Coupling (DAC) represents the third technological pillar** for an increased and better used railway capacity. Indeed, coupling and decoupling is one of the main procedure in train operation so that its automation is of major importance to improve railway operations. A DAC also couples the air line for the brake and a power and data bus line. This is offering two major advantages: firstly, it will increase productivity by eliminating the manual coupling process and it will also provide the technical basis for an intelligent freight train with enhanced traction and brake control, automated operations such as brake test, and continuous monitoring and detection of safety related issues such as wheels flat detections, hot axle boxes, derailment detection. The effects of these innovations would be to increase safety, speed of operation and the capacity of the rail infrastructure. The EU DAC Delivery Programme has been set up under the umbrella of Shift2Rail. Its members are participating in the relevant working group of ERA to make DAC specification a reality available for the whole EU rail system in the TSI package 2022. The signatories commit to the Union-wide deployment of the digital automatic coupling in the rail freight sector until 2030, subject to a sound migration plan, strong financial and deployment support by European Commission as well

[26] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R0006
[27] https://ec.europa.eu/transport/sites/transport/files/swd20210001-7th-rmms-report.pdf

as Member States, which will pave the way to achieve this goal encompassing all concerned actors[28].

Finally, the Covid-19 crisis has put the light on the necessity to increase the capacity at train level. Modularity of passenger trains interiors with a capacity of up to 1300 persons can ensure the physical distance in case of sanitary crisis while being fully used in normal period. Contrary to the road transport, in the railway network trains cannot be stored en-route because of the separation in space. Thus, any capacity bottleneck can rapidly impact the traffic throughout the network as shown e.g. by the Rastatt incident. Currently, most the freight circulating in the EU are less than 600m long. **740m long freight trains**, on the other hand, can increase the capacity by up to 25-30% on most of the networks and have the potential to substitute 52 trucks. Supporting the investment in new rolling stock or in their refurbishment together with the adaptation of the infrastructure, especially with longer railway sidings and transshipments facilities, is essential to achieve the modal shift. It could also participate in the development on innovative services like the one developed by Mercitalia in the last 3 years. Indeed, Mercitalia Fast Service is a clear example of development of a new service by exploiting a growing logistic market segment, the e-commerce, and adapting high-speed passenger trains into freight trains.

Mercitalia Fast experience

A team composed of Mercitalia and Ferrovie dello Stato staff members started an internal analysis on the e-commerce and express delivery sector in October 2017. From this market analysis, a decision has been made to create a new "innovative and disruptive" service called Mercitalia Fast for a growing logistic market segment, e-commerce, by adapting high-speed passenger trains into freight trains. In order to decrease the time for authorizing the vehicles, the closest configuration to the passengers' trains has been adopted:

- ETR 500 with a maximum speed of 300 Km/h has been used with 2 locomotives at the extremities and 12 wagons allowing for a maximum speed of 250 Km/h with this composition;

[28] https://www.bmvi.de/SharedDocs/DE/Anlage/E/technical-report-dac-technology.pdf?__blob=publicationFile
In a study from the German Ministry of Transport and Digital Infrastructure, it has been estimated that it would represent the upgrade of more than 400 000 railway vehicles in Europe ensuring an interoperable solution for the migration with a migration cost estimated between EUR 6.4 to EUR 8.6 billion. The payback period for an investment in the DAC is considered to be 18 years. However, with lowered procurement and conversion costs and higher benefits, the payback period could be only nine years.

- Internal furnitures, toilettes, drains and other components for the passengers service have been removed to enable the cargo capacity without exceeding the maximum and minimum weight of passengers wagons;
- No modification of the doors;
- The fire prevention system has been maintained as of a passenger train;
- Some specific ballasts have been developed for empty wagons.

In addition, an algorithm to distribute the load coherently and to avoid overload has been developed. Some load simulations for different balancing situation have also been conducted to guarantee safety against derailment.

With this Mercitalia Fast service, new types of goods are transported such as mobile phones, clothes, wines and food, glasses. In addition, Mercitalia Fast started a partnership with Nextive for the e-commerce sector. The goods are transported on a North-South axis of Italy during night hours. Mercitalia Fast trains operate as the last train in the night and the first in the morning with the objective of delivering the goods at the most convenient time for the last miles delivery. Reduced track access charges could also be beneficial for this kind of services, especially as this is a growing market trend and in favour of intermodality. Finally, the A1 highway connecting North and South of Italy is congested due to heavy traffic of trucks and, in the first year of service, Mercitalia Fast service was able to shift about 8000 trucks from the road to rail.

III. A Green logistic chain through a Multimodal Strategy

Rail is the most competitive transport mode in dense routes but the first and last miles tend to be very costly, both for goods and passengers. By experience, it is clear that a modal shift will not be the result of railways completely substituting other transport modes. On the contrary, goods and passengers will shift to railways, as they are better integrated in the wider transport and mobility system. Therefore, in order to increase the share of the rail freight transport, it is necessary to develop a **green transport logistic chain** where the synergies between modes of transport are optimized. The transport of goods require simple and efficient transfer/transshipment from road to rail, as well as from vessels to railways in ports. By doing so, the railway sector would be fully part in the global logistic chain of containers' traffic.

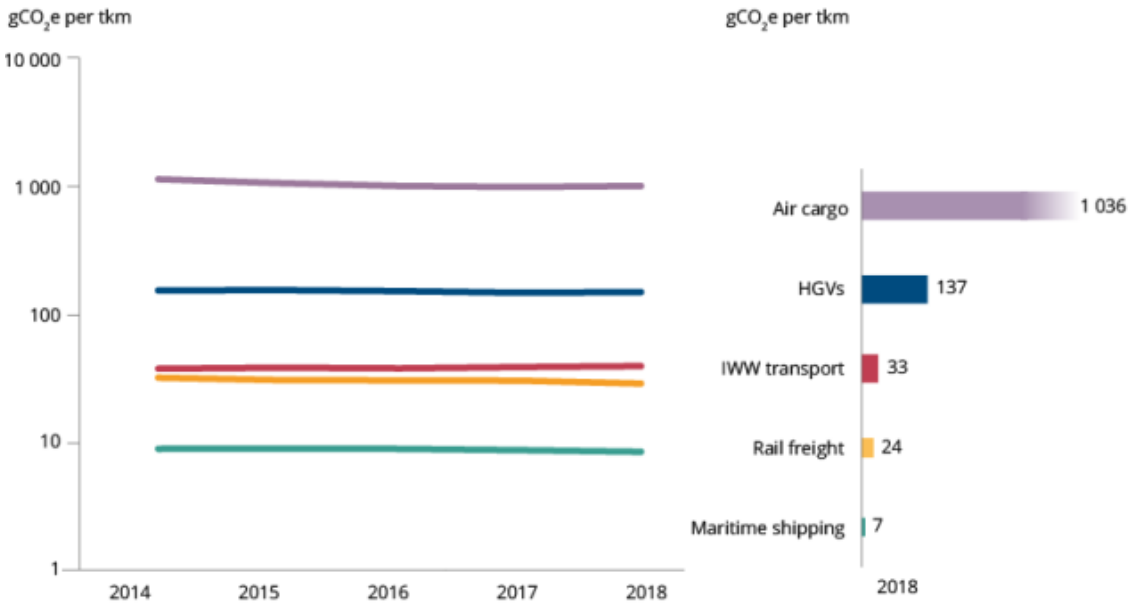

Figure 4: Average GHG emissions by motorised mode of freight transport, EU-27, 2014-2018 (Fraunhofer ISI and CE Delft, 2020 in EEA report)

➔ Favoring the Intermodal and Combined transport

According to the UmweltBundesamt (German federal environmental Agency), the climate gap between the modes of transport is growing, especially in freight transport. While the railway sector has reduced by 26% its greenhouse gas emission per kilometer and transported ton between 2013 and 2019, the road sector has only reduced its emission by 8%. Nowadays, the transport of goods with freight trains emits six to seven times less greenhouse gas emissions than with trucks. In addition, a truck with an axle load of 10 tons stresses the traffic routes per unit of distance 160,000 times more than a car with an axle load of 0.5 to 1.2 tons. This makes truck traffic the decisive factor for the stress on the road structure[29]. A comprehensive shift in traffic from road to rail also significantly reduces road wear and thus the road maintenance costs for public authorities. Additionally, it decreases the number of accidents, the rail transport being significantly safer than the road sector. In general, road transport is the largest contributor to external costs (83% of the total costs, EUR 820 billion) while it is only EUR 18 billion for rail transport.

[29] Forschungs-Informations-System

Combined transport is a solution to reduce the environmental footprint of the truck sector and increase the share of goods transport by the railway sector. The more attractive the combined transport is, the more transport volume will be shifted to rail. **Combined transport is an example of greener logistic chain** when the benefits inherent to each mode of transport are optimized. These benefits are, for instance, the flexibility of truck over short distance (below 300km) and the highest degree of energy efficiency, a low carbon footprint and a higher labour productivity of electric trains over long distance. The dominant segment for the combined transport is the distance between 600km to 900km but the modal shift starts from distances above 300km and is also possible for distances below 300km.

A key element to reduce the GHG emissions from our transport system is to dramatically limit the number of HGV on distance higher than 700km. There is a significant potential for modal shift – a 90% reduction of road freight traffic distances over 700 km would have the potential to lead to a market share for rail of 36% while saving approximately 40 million ton CO2 (reducing by 21% from 190 million ton CO2 for road transport).

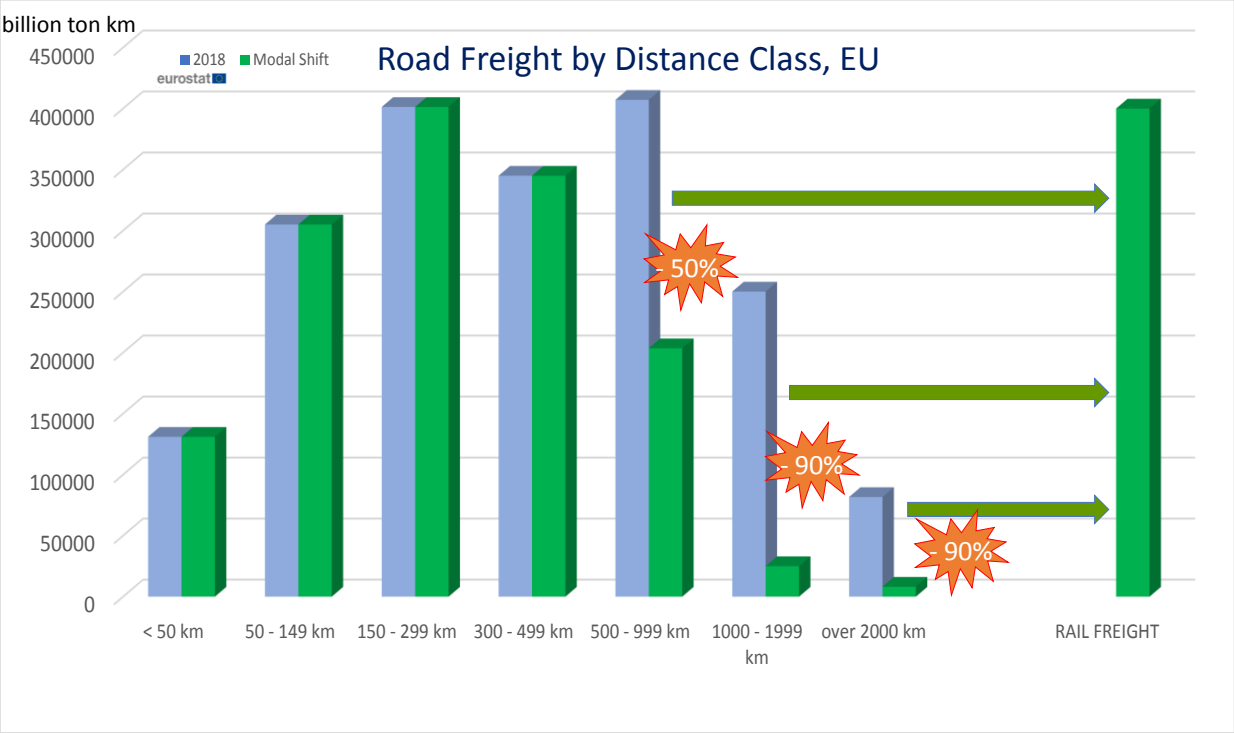

Figure 5: Potential modal shift from road to rail (ERA, May 2021)

Ports' experience

For combined traffic with an origin or destination in a Port, the market segment below 300 km can also be competitive to shift trucks onto rail. Indeed, many ports have regular rail connection to terminals within a range of 100km distance and are very important to reduce road congestion and negative externalities in urban areas.

For instance, in Barcelona, there are 3 daily bulk trains coming from the mines in Suria, distant solely 80 km away from the port. There are also 3 daily trains from a car factory in Martorell distant 30 km from the port and also daily container trains from Tarragona and Lleida which are both 100 km away from the port and others with locations within the 300 km range such as Monzón. The first intermodal corridor in Spain today is the Port of Barcelona-Zaragoza relation (300 km distance) with more than six daily container trains.

Finally, the important recent growth of Trieste port is a good example of functional integration to the so-called "retro terminals" in close distance to the port. Since 2016, the Port authority of Trieste has also the management governance of the port of Monfalcone distant approx. 30 km from Trieste. Both ports are very well linked to widespread the railway network - able to operate Eu standards freight trains - and to two important freight villages ("interporto"), Fernetti and Cervignano del Friuli. By developing a logistics satellites concept, these two freight villages are working as extended quays of the port used to optimize the port services. In addition, since 2015 the port started to provide shunting services through its company Adriafer allowing thus a facilitation of the railway operations. Nowadays, 50% of the traffic of containers arrive to the port by train and 25% of the trucks as well with a constant growth over the last years. 200 Mio euros are planned to be invested to increase the railway capacities from 13.000/15.000 trains/years to 30.000 trains/ year in 2026-2030 but thanks to the current 10.000 trains operated, Trieste Port gets the lead of the Top italian Rail ports ranking. The high use of the capacity obliges to optimize the synergies between modes of transport and railway stakeholders in order to guarantee the capacity on the railway node.

In 2019, combined transport operators transported 4.4 million truckloads of cargo that resulted in 80 billion tkm of output (+55% of ton-km between 2009 and 2019). According to UIC report[30], every second freight train in Europe has become today an intermodal train and over 50% of rail

[30] https://uic.org/IMG/pdf/2020_report_on_combined_transport_in_europe.pdf

freight tkm can be attributed to combined transport. While combined transport is developed in the whole of the EU, the North-South axis is the most frequently used route in the last years.

Trade lane		TEU			Tonnes		
		2017	2019	Develop-ment	2017	2019	Develop-ment
Germany	Italy	1,553,328	1,905,995	22.7%	19,915,267	23,611,992	18.6%
Czech Republic	Germany	756,729	930,616	23.0%	7,649,439	9,073,580	18.6%
Belgium	Italy	714,694	739,807	3.5%	9,156,448	9,424,007	2.9%
Germany	Netherlands	581,379	736,490	26.7%	6,686,219	6,404,879	-4.2%
Italy	Netherlands	458,025	520,641	13.7%	6,118,486	6,873,913	12.3%
France	Luxemburg	205,037	343,068	67.3%	3,127,385	4,295,679	37.4%
Germany	Sweden	256,745	336,502	31.1%	2,813,600	3,860,833	37.2%
Austria	Germany	358,729	328,802	-8.3%	3,896,851	3,508,415	-10.0%
Slovakia	Slovenia	319,922	301,788	-5.7%	2,552,178	2,678,030	4.9%
France	Italy	247,682	269,662	8.9%	3,259,281	3,559,284	9.2%
Germany	Spain	214,299	244,199	14.0%	2,567,637	2,877,590	12.1%
Germany	Hungary	209,436	243,337	16.2%	2,321,643	2,265,879	-2.4%
Hungary	Slovenia	217,777	208,223	-4.4%	2,122,831	2,058,368	-3.0%
Hungary	Italy	54,476	186,667	242.7%	445,528	1,441,846	223.6%
Austria	Italy	136,509	176,528	29.3%	1,568,315	2,126,449	35.6%
Belgium	France	152,626	149,550	-2.0%	1,299,600	1,367,935	5.3%
Russia	Slovakia	102,090	123,145	20.6%	689,465	769,517	11.6%
Germany	Poland	161,026	119,475	-25.8%	1,284,398	933,774	-27.3%
Czech Republic	Netherlands	116,105	116,743	0.5%	802,261	809,172	0.9%
Belgium	Luxemburg	43,572	115,840	165.9%	923,230	1,623,537	75.9%

Figure 6: Major European trade lanes in international unaccompanied Combined transport (in TEU and tons) – BSL transportation analysis based on survey

Despite a sustainable growth over the last 20 years, combined transport still faces some challenges impeding the sector to grow even further. Indeed, while the capacity of the terminals was the major concern for the growth of this sector in the '90's, from 2008 onwards, the main difficulty in terms of capacity are the nodal points in the hinterland. The railway connections can be increased only if there are appropriate investments to create nodes of terminals adapted to the capacity of long freight trains (740-750m). In order to determine where those terminals should be created, a **large analysis of the demand on all of the freight corridors together including the terminal capacities in and around ports should be made with a prioritization made accordingly**. This analysis should in addition contain an identification of the key stretches on the European rail network that are not used in the optimal way. Rail freight corridors coordinators are making individual analyses[31] but there is not yet a harmonization of the

[31] https://www.corridor-rhine-alpine.eu/files/downloads/others/Transport%20Market%20Study%202018.pdf

parameters used and a mapping at European level and not only at corridor level could be interesting. Frequent market studies of where traffic demand is could complement this analysis.

The development of the transport of standardized maritime containers on-board the train with 62% of the market - the swap bodies are representing now 21% and the semi-trailers 17% of the combined transport market - indicates a strong need to transform the railway fleet by investing more and more on intermodal wagons. In addition, only a small fraction of trailers used in Europe is craneable. This means that special technologies such as Modalohr[32], Cargobeamer[33] or R2L[34] from Vega are necessary for putting such trailers on trains. In December 2020, the European Investment Bank signed a financing agreement of 12.6 million € with CargoBeamer to support deployment of new freight rail technology and the development of new rail freight terminals in France, Italy and Germany. On long-distance transport the freight forwarders are using semi-trailers for moving goods in Europe. Different techniques exist to accommodate these trailers into specialized wagons: either by adding a special device on the trailer or on the wagon. Investments are done in both systems but **craneability must improve with potential design constraints on semi-trailers**.

The quality of the railway freight transportations is often not at the expected level for logisticians. The lack of coordination in the temporary capacity restrictions (TCR) is having heavy consequences as the customers, temporarily shifting their traffic to the road, are not necessarily coming back to the railway sector when the situation is normalized. The development of European timetabling (see Chapter 5), harmonized operational process to cross borders and joint and transparent management process for the path allocation and the TCR is essential to increase the competitiveness of this sector. As mentioned in ERA's previous report, the creation of a Eurocontrol for rail could have a fundamental impact on those elements[35].

Finally, **ERA has a dedicated working group on combined transport** that is working on more technical aspects related to the codification of lines, wagons and loading units to harmonise and facilitate the route compatibility check on the European network. Proposals following ERA's recommendation should be adopted in 2022.

[32] https://lohr.fr/fr/lohr-railway-system/les-wagons-lohr-uic/
[33] https://www.cargobeamer.eu/
[34] https://www.roadraillink.eu/index_en.html
[35] See p.28-29 of https://www.era.europa.eu/sites/default/files/events-news/docs/fostering_railway_sector_through_european_green_deal_en.pdf

➔ Developing a Sea-Rail-Waterways strategy at EU level

74% of goods imported/exported to/from the EU are transiting through a European port with cargo volumes which keep growing. It is thus essential to ensure a good synergy between the maritime, the waterways and the railway sectors. Indeed, currently most of the goods are transported by trucks after reaching a port. With the large amount of goods transiting through European ports, they play a crucial role for multimodal transport and could play an even bigger role in ensuring the modal shift. For instance, between 50 to 60% of the rail freight volume in Belgium is going from or to the port of Antwerp and, for the port of Hamburg, it represented approximately 15% of the rail freight volume of Germany in the last years. So 1 out of 2 freight train in Belgium and 1 out 7 freight train in Germany starts or finishes its journey in the biggest port of the country. Especially in the last years, the seaports have evolved from their traditional role of loading/unloading to clusters of industry/logistics, energy providers integrated in the so-called "blue economy". **The ports are becoming more and more multimodal hubs in which railway should play an important role.** In their joint position paper, the European Sea Ports Organisation (ESPO) and the European Federation of Inland Ports (EFIP) indicated that "European ports' efficacy relies on their ability to optimize water, road and railway transport links across the entire transport network. Efficient rail operations and links to and from the ports, as well as within the port, are essential to maximize the use of rail as a sustainable transport mode and to comply with the priorities set in the TEN-T legislation"[36]. This is also true for the inland waterways which form a 20.000km of network free of congestion with around 250 ports and for some of those inland ports, the railway business is more important than the inland waterways business.

Le Havre and Antwerp: examples of rail strategy

In Le Havre's port (96MioT), 87% of the goods are put on a truck, only 4% on a train and the remaining 9% are going through inland waterways[37]. One of the main issue of the ports to increase the share of goods transported by rail is not only the cost but also the **reliability of the railway services**. Despite those issues, many ports are willing to increase the share of goods transported by rail with own initiatives. For example, the objective for Le Havre-Rouen-Paris (Haropa) ports is to reach 20% of the goods transported by train in 2025 through the improvement on the railway line Normandie-Ile de France, going around the North of Paris and improving the urban logistics with partners such as Sogaris. The sea ports authorities are

[36] Ports in the European Rail system, joint position paper of ESPO and EFIP, 2019.
[37] Haropa

interested in developing the freight by rail or barge because the ports are usually fully integrated in urban areas and must thus actively participate in reducing the road congestion with all the negative externalities associated to it. The only possible way to reduce this road congestion with a sector growing is to improve rail and waterways connections.

One other interesting example is the port of Antwerp, Europe's second largest port, whose main driver of growth over the past 20 years has been the maritime container transport. In order to accommodate this growth, important investments will need to be channeled into new terminals and additional capacity. This includes investments into new rail infrastructure, as well as the building and re-building of terminals. Currently, only 7% of the containers are transported by rail with the objective to reach 15% by 2030. The government obliges the port to ensure a sustainable development of the port within the city without affecting the road traffic. Therefore, by 2030, all the growth in traffic of the port should be absorbed either by the rail sector or the waterways. With this in mind, the transport of containers by rail will need to be facilitated from the point of view of the rail operator, the terminal as well as the shipper. It is in this context that the Port of Antwerp, Infrabel and Railport announced their joint plans to grow the port's share of goods transported by rail in the end of March 2021 with a strategy containing seven pillars. These pillars are covering the various aspects to increase the rail modal share from parking policy to smart investments and from regulatory framework to the development of a digital platform for the mutual exchange of information.

From an operational and investments point of view, the ports cannot be treated like any other kind of infrastructure on the European railway network. In order to increase the share of freight transported by rail, there is a clear **need of synergy strategy between the maritime, the waterways and the railway worlds elaborated at EU level**. The aim of this strategy would be to define the key features to develop optimized ports-rail ecosystem including at the least the following components:

- Define infrastructure needs: overview on capacity allocation and use of terminals, cross-border connections (different gauges, mixed lines, contruction), last mile connection to the TEN-T network up to the port network and private terminal e.g. lines not always electrified within the port with the need of diesel locomotive to enter the port. The prioritization on the elimination of the last mile bottlenecks and on the investment on hybrid locomotives in the CEF calls would be key to solve those issues.
- Identify operational issues which are hindering the synergy between those two modes of transport: coordination mechanisms between stakeholders, high-quality slot allocation, information exchange and data sharing (type of freight, ETA).

- Determine policy incentives to improve the synergy between modes of transport.
- Establish the baseline for a regulatory framework boosting the cooperation between modes of transport: the rail related investment needs account for up to 20% of the ports' total needs[38]. To ensure an optimal synergy between the maritime, the inland waterways and the railway sectors, it would be fundamental **to launch a legislative initiative covering interoperability between modes of transport**, to develop multimodal hubs and to eliminate the administrative burdens impeding to work efficiently between modes of transport and increase operational flexibility, including a potential separate rail model in ports. Such an initiative could also set up a framework for multimodal digitalization.

It is also important to notice that the investments in high-speed lines are usually freeing some capacities for the railway freight on the conventional lines so that any investment in high-speed passenger transportation should eventually positively impact the freight sector[39].

➔ Tackling the last mile challenge: urban railway logistics

As mentioned in the introduction of this chapter, the first and last mile of a railway freight journey tend to be very expensive[40]. Especially in urban areas, intermodal services are difficult to implement for last mile deliveries, as waterways and railways are used mostly for high volume flows. The vast majority of the urban freight sector continues to use diesel light goods vehicles and fleet modernisation is slow but is currently accelerating. In addition, this market is growing rapidly and its growth should accelerate even more with the covid-19 crisis. Indeed, the increasing demand for smaller, more frequent collections and deliveries to companies (just-in-time distribution) together with the rise of e-commerce and greater demand for home deliveries and parcels distribution indicate that this market should not be left apart from the decarbonisation of our economy. Some experiments in intermodal services for the "mile before last" have been implemented in recent years.

Since 2011, freight transport service by light rail for smaller volumes has been initiated in Kyoto for the parcels that are then transported by electric bicycles. This could be another service provided by important food delivery platforms, considering that there is already a workforce and

[38] Ports investment study, 2018, ESPO.
[39] See p.16-21 of https://www.era.europa.eu/sites/default/files/events-news/docs/fostering_railway_sector_through_european_green_deal_en.pdf
[40] Last mile delivery is defined as the movement of goods from a transportation hub to the final delivery destination.

a delivery system in place. The passenger regional trains and tramways could be used outside of peak hours for such delivery systems. In Karlsruhe, a joint project called LogiKTram has been launched in order to transfer the last mile delivery from road to light rail or trams.

Monoprix in France is also an interesting case. Specifically, Monoprix ships by rail to a downtown Paris logistics centre over a very short distance (30 km) since 2007. Hence, road congestion is hardly influencing the supply chain, in contrast to the former supply chain organization. From that logistic centre, more than 80 shops located downtown Paris are supplied. From a social point of view, a reduction in vehicle kilometers can limit road congestion and CO_2 emissions. The road network surrounding important cities is usually congested and this concept is one of the solutions. From a logistics, company point of view, these reductions in emissions and congestion can lean the supply chain.

Railway passenger stations should be increasingly used as a network of collection points which could be an additional source of revenue for the infrastructure manager. The passenger regional and suburban trains could also be used for the transport of parcels.

Figure 7: hôtel logistique Chapelle international – Paris (A.26)

Finally, in France, a new concept is more and more developing: “Hôtel logistique” or “logistic hotel”. The principle is to group the flows and the needs and to pool the vehicles fleet, the cross-docking in warehouses, common platforms and workforce. The companies which are using those “logistic hotels” are beneficiating from a **joint multimodal structure which allows to work on big volumes as the different stocks from the different companies are put together which eventually allows to have a 24/7 logistic supply chain** in those city-based logistic centers. In Paris, for instance, traffic restrictions have put the logistic warehouses outside of the city but with the extraordinary growth of the e-commerce, these warehouses are not sufficient anymore. There is a need of smaller ones in the heart of the cities in order to get the distribution closer to the consumers. The project “Chapelle International” by Sogaris which started its operation in 2018 developed a 400 meter long Urban Rail Terminal to carry goods in Paris thanks to an Urban Rail Shuttle in a multimodal approach to answer the needs of companies and consumers taking into account the city constraints. Eventually, this kind of offer is also flourishing in Bordeaux and Lyon where inland port is also used. The costs for stocking, cross-docking, transport and maintenance are thus shared by all stakeholders but offers a single point of contact which manages the entire logistic supply chain.

A conclusion to this multimodal strategy could be that eventually, it might be necessary **to create a Land Transport Agency or a multimodal Agency** to ensure that some specific mechanisms are put in place to ensure the optimized level of interconnection between railway and other modes of transport.

IV. An easy access to the rail offer

➔ Developing a marketplace for rail

The growing need for easily adjustable logistic services and transparent information is also creating a need for digital brokerage platforms aiming at matching the diversity of the logistic demands with supply. The creation of these centralized marketplaces should provide a greater transparency on rates, services and environmental performance of different logistics providers with the final objective to meet in a tailored-made way the needs of each customer.

Those freight exchange platforms have existed for some years now but mostly for the road and the maritime sectors. Important potential customers do not necessarily orient themselves towards the rail option when logistics’ needs arise due to the lack of information and difficulty to find them centrally. Those existing marketplaces are quickly evolving and could potentially

completely disrupt the logistic market by digitalizing the entire end-to-end logistic processes. Those marketplaces indeed match companies looking to ship freight using one or multiple modes of transport (road, air, sea/waterborne, and/or rail) with freight suppliers or brokers. The integration of those marketplaces with central planning and tracking tools will further enhance their impact and might affect certain types of job like freight forwarder or freight broker/commissionaire de transport. Finally, those marketplaces, following the development of environmental labelling, could provide sound information on transport eco-labelling to help shippers to make well-informed choices for low-carbon logistics. These marketplaces have been created to support the development of an atomized market, mainly the road sector, to facilitate the junction between offer and demand. Rail sector has more tailor-made activities but the **integration of the rail offer in marketplaces** is essential to ensure a visibility and transparency on potential alternatives to the road offer and to start developing more aggressive strategy to capture new segments in the market.

The rail sector also needs a European platform or an ecosystem of data platforms for **rail freight data exchange** to improve service quality and speed up processes. The EU is promoting the establishment of such a platform. As the competitiveness, especially the green competitive advantage, of rail freight transport increases, more and more customers will use rail as an alternative to heavy goods vehicles. Those customers must be aware of the facilities offered by the rail sector. Regulation (EU) 2020/1056 of 15th of July 2020 on electronic freight transport information is a step in this direction. In addition, the development of the **Rail Facilities Portal** which provides access to information on all rail facilities, in particular rail freight facilities, e.g. for the planning of rail services is also a tool ensuring more transparency on the rail offer. RailNet Europe has technically taken over the portal in June 2020 while the Portal still faces some difficulties to get populated and used.

➔ Identifying the missing links

In March 2018, the European Commission elaborated a study on the missing links on the internal EU borders[41]. 365 cross-border rail connections were identified in total 149 of which are non-operational today (41%). However, rail freight was not considered as part of the study, although it can have a significant effect on the economic viability of railway lines. If some of the missing links identified like Gent [BE] - Wondelgem [BE] - Terneuzen [NL] or Guben [DE] - Czerwieńsk [PL] would also have interest for the freight sector, there is no **dedicated study providing an overview on the bottlenecks for the railway freight sector** on the European railway network.

[41] https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cb_rail_connections_en.pdf

In 2004, UIC tendered a study on the infrastructure capacity reserves for combined transport for the traffic planned in 2015[42]. The objective was to identify the crucial bottlenecks for the combined transport and the necessary investments to focus on to eliminate them. In particular, in 2004, bottlenecks were identified in 4 Member States and Switzerland.

Country	Main axes with bottlenecks
Germany	Hamburg – Rhein/Main
	Köln - Rhein/Main
	Saarbrücken - Stuttgart
France	Metz-Dijon
	Lyon-Avignon
	Paris – Orléans - Tours
Belgium	Freight corridors from/to Antwerp
Switzerland	Greated Basel aread
Spain	Barcelona - Tarragona

Figure 8: Main international rail freight axes with bottlenecks by 2015 (UIC study from 2004)

As this study was focused on combined transport, it also studied the need of terminals based on the growth projection in 2015.

Country	Terminal areas with additional capacity need
Austria	Graz, Villach, Wien, Wels
Belgium	Genk, Zeebrugge
Czech Republic	Praha
Denmark	Taulov
Germany	Hamburg, Köln, München, Neuss, Ludwigshafen/Mannheim
Italy	Milano
Poland	Gliwice, Poznan, Warszawa
Spain	Barcelona, Valencia

Figure 9: Terminal areas with additional capacity need by 2015 (UIC study from 2004)

[42] https://uic.org/IMG/pdf/2015_combinedtransport_study_capacity_report.pdf

The coordinators of rail freight corridors are also producing analysis on the existing bottlenecks on the corridors (e.g. Mathieu Grosch on RFC7[43]). However, there is no overview on those bottlenecks neither a map to better visualize them at European level. This would be the first step in the establishment of a **master plan for the necessary investments on the infrastructure and transshipments facilities to improve freight capacities**.

➔ Identifying the market of tomorrow

Today, the main goods transported by rail are metal products, which represent 43% of the goods transported followed by raw materials (29%), chemicals (14%), agricultural products and forestry (8%) and food and drinks (6%). It is clear from this structure of goods transported by rail that the focus is on heavy materials and dangerous goods. Rail Freight Forward has made an analysis of the evolution of the transport market structure by goods.

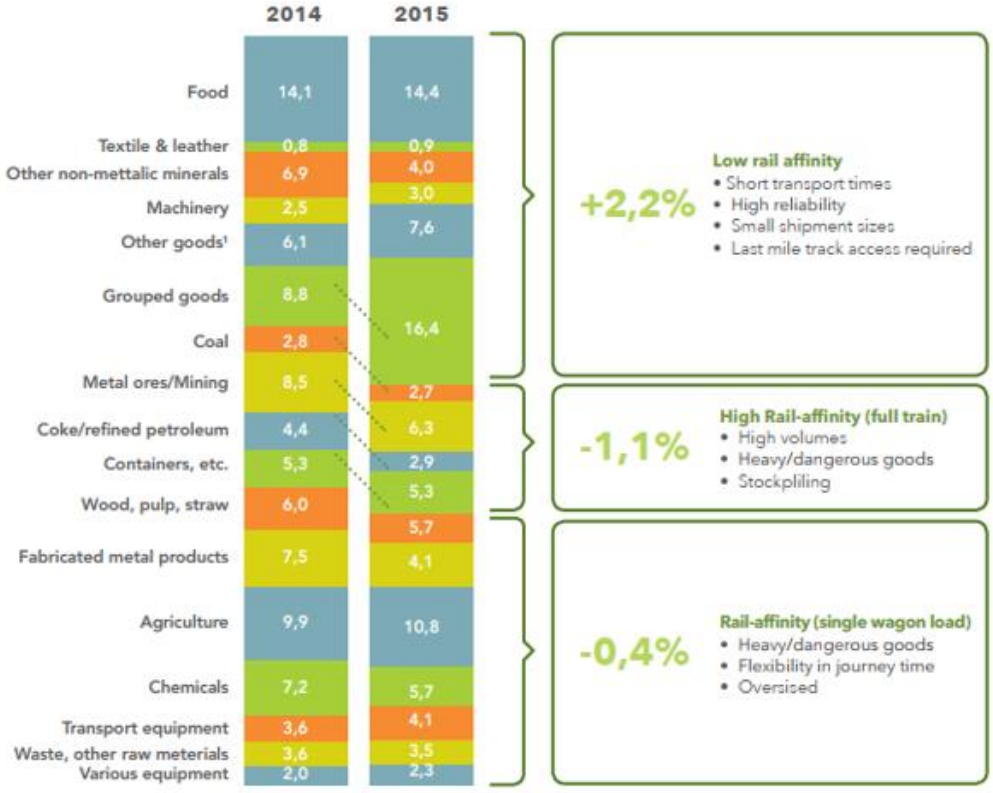

Figure 10: Transport market structure by goods, 2014-2015 – Rail Freight Forward

[43] https://www.rfc7.eu/system/files/2020-10/RFC%20OEM%20CID%20Book%20V%20Annex%205%20-%20TMS.pdf

This analysis shows that market growth for goods with a low affinity to rail, especially grouped goods, are growing strongly while goods with a high rail affinity, like metal products, are seeing a negative trend. Thus, goods with low rail affinity typically share specific characteristics: small shipment sizes (parcels which growth is exponential, especially with Covid-19 crisis), requirement of short transport times as well as availability of last mile access to the rail track network at both ends of the transport chain. **Rail freight can participate in the transport of this kind of goods through an intermodal transport chain**, which reinforces further the need to strengthen the multimodal approach in the logistics. In addition, experiences such as the one from Mercitalia Fast must be promoted.

Developing rail freight transport beyond Europe

While the first connections between China and Europe – officially branded as the China-Europe Express later on – were tested in 2008 by private companies, they have grown exponentially ever since, gaining political support under the Belt and Road Initiative (BRI) and 17+1 initiatives. While there were only 11 China-Europe trains in 2011, the number has grown to 8.255 in 2019. For instance, during the first 8 months of 2020, the rail freight transport between China and the European Union has increased by almost 50%[44] creating congestion at the border point between China and Kazakhstan. Similar situation has been experienced at the border point between Poland and Belarus, Małaszewicze where around 90% of the goods transported by rail from China are transiting. Although the growth was extremely fast due to the covid-19 crisis, the increasing trend is stable and the growth is still expected to continue. As a consequence of this congestion, the Chinese Railway Bureau requested to limit some services in order to manage this congestion due to high demand of rail freight transportation. During the Covid-19 pandemic and the restrictions on international transport the competing road transport between China and Europe increased significantly[45]. Investments for transshipments points for rail on EU territory must be secured in order to support this growth.

However, rail freight cooperation with China is not always smooth. Mirroring the overall trade imbalance in China-EU trade, rail transportation has been overwhelmingly tilted towards inbound cargo to Europe, with trains often returning half-empty on the return journey to China. For this reason and because of the overall higher costs of transporting goods to Europe

[44] Ganyi Zhang in https://market-insights.upply.com/fr/-chemin-de-fer-chine-europe-congestion
[45] Ganyi Zhang in https://market-insights.upply.com/en/the-emergence-of-road-freight-between-china-and-europe

by rail as opposed to sea, the connections have been heavily subsidized by local governments in China, leading to significant market distortions. With the central government planning to gradually withdraw the subsidies, it remains to be seen how much of the current trade volume will continue. Finally, despite the lowered costs, rail transport only remains competitive for a selected segment of goods, where transport faster than by sea but cheaper than by air is necessary.

The slow migration to digitalized railway in Europe puts a speed limit on the European R&D efforts and leaves room for other players to enter the market with a more aggressive strategy backed up by huge investments. China's government, for example, has pushed hard to export railway technology, and the Chinese rolling-stock industry dominates many segments—more than 50% of global high-speed trains, for example, are now produced in China. The export share of China's CRRC has doubled in recent years, including via contracts in mature markets such as Germany, and it is now by far the largest rolling-stock manufacturer in the world. Exports of signaling technology have lagged behind, but China is investing significantly and is likely to compete in Europe too before long.

V. The Customers as the central focus

Apart from the reliability of the railway services, one of the main and frequent criticism made to the railway sector is its lack of flexibility in taking into account customers' needs and, more generally, to improve the customer experience.

➔ Ensuring an end-to-end path allocation through a Eurocontrol for rail

RailNet Europe (RNE) has launched in 2017 the Time Table Redesign project (TTR) with the aim of streamlining timetables and capacity management for international trains. Indeed, among all the obstacles that international train traffic still suffers, disruption in the management of railway capacities due to temporary work, unforeseen events or path not used but not canceled is impeding an optimal use of the European rail capacity.

Currently, to operate a train from Le Havre to Warsaw, you have at best to contact three organisations, in France, Germany and Poland which may not be coordinated among themselves. This is clearly a hindrance for the customers who would like to transport freight through rail. The idea is to gather all stakeholders in order to have an overview on the available capacity and to coordinate the needs and the distribution of available capacity. The project faces many obstacles

due to national differences, the target date to achieve the project is in 2025 but only 11 countries are participating to it.

It is true that the majority of the proposed mathematical optimization models become impractical when trying to solve the timetabling problem for large geographical areas and many trains. However, since the advent of computers, people started to think about ways to automatize the process. This automatization process could be a game changer in the timetables and capacity management.

Another option to ensure an end-to-end allocation of capacity process is to devolve it to a centralized authority. The lack of integrated traffic and capacity management is detrimental to traffic predictability and an efficient use of this network. In addition, the lack of international cooperation persists because public authorities, railway undertakings and infrastructure managers are primarily held to account for their performance in providing domestic services and to a lesser degree for international services. What is needed is a European mindset for rail passenger and freight services, based on a supportive regulatory framework, and the right incentives to operators for offering cross-border passenger rail services and more customer-friendly freight services.

An **EU-wide control authority to allocate train paths to operators** (similar to the Eurocontrol's Network Manager function in civil aviation) could be created. Following Commission Implementing Decision (EU) 2019/709, Eurocontrol is in charge of traffic flow management, capacity planning and management and crisis management for traffic re-routing. All relevant stakeholders of the Single European Sky, including air navigation service providers, the 'infrastructure managers of the sky', participate in the Network Manager function. A similar authority for the railways could facilitate cross-border path allocation, crisis management to find alternative routes in times of need, increase efficiency and decrease costs of rail transport. Indeed, the strong European dimension of the freight sector – more than 50% of the railway freight transport is international - means that rail freight is particularly suffering from the lack of a truly Single European Rail Area. In particular, it suffers from the lack of interoperability between the different networks and of coordination of operations, at the borders or in terms of rail capacity and traffic management. The Eurocontrol for rail would also reinforce the clean-up of national rules which often create obstacles. Finally, it would be the catalyser for the further development of the Rail Freight Corridors which are currently focused only on corridors and mostly on the task of one-stop-shop for train paths.

The governance of such a new body could consist of a mixed representation of high-level Member States representatives and EU representatives (general policy, budget and programme), a management board consisting of infrastructure managers and capacity allocation bodies (implementation) and an Agency in charge of executing. The role of this Agency could be:

- Ensuring a rail traffic supervision and monitoring at European level. Infrastructure managers and capacity allocation bodies need a structured and standardised way of coordinating traffic across borders. A European traffic control system could ease national traffic management centres to work together in a defined standard approach for a smooth transfer of international trains from one part of the network to the other.
- This Agency should furthermore assume the role of coordinating and planning between parties to ensure, among other things, better connections between train paths and services.

➔ Europeanising the concept of regular timetables

Some third countries and EU Member States (e.g. Switzerland, the Netherlands, Austria and much of the German network) have introduced regular timetables for passenger trains 30 years ago. These timetables are designed with strong and sensible patterns of regular intervals, good connectivity and departures at the same time each hour. For passengers, given a uniform distribution of desired departure times across an hour, an equal interval timetable will minimise the expected waiting time on average amongst those arriving at random and will minimize displacement time amongst those who plan their journey.

The Swiss example

In Switzerland, the regular timetable ('Taktfahrplan'[46]) is planned around the national rail network. Hourly or half-hourly long distance trains come together (or 'pulse') on the hour and half hour at the network's core stations of Zurich, Basel and Bern. A similar approach is applied at designated pulse points on local and regional rail networks throughout the country: buses and trains arrive before the pulse time, wait a short time to allow passengers to change between services, and then depart. The pattern repeats every hour (or half hour), and as a result, trains also depart all intermediate stations at repeated times every hour. When planning the location of pulse points, the Swiss start by assuming a one-hour headway and identify

[46] https://www.zukunft-mobilitaet.net/42868/analyse/integraler-taktfahrplan-itf-schweiz-deutschland-deutschlandtakt-umsetzbarkeit-konzept/

major travel corridors radiating from a central pulse point. Zurich's main station is used as that point, although it needs not always to be a region's largest city. Each corridor extending from the central point is then examined to identify an important place that vehicles will reach in just under an hour's travel time (often around 55 min, allowing time for vehicles to converge and passengers to transfer). A major station or stop would make an ideal next pulse point, because hourly services travelling simultaneously in opposite directions to or from the central pulse point will always meet at that location. At the halfway point, just under 30 minutes' travel time from the central pulse point, services will also pass each other at a 'meeting point'.

Switzerland started to use the same principle of the regular timetable as well for freight transport[47]. It would be useful to study if such a concept could be introduced as well on a broader scale for the freight transport.

For cross-border trains, symmetry minute should be applied in all served Member States to avoid unnecessary waiting times. Predefined slots for freight trains could then facilitate their planning. One of the key principle in this planning approach is to target the timetable first and then only the needed infrastructure. The regular timetable's repetition is attractive to rail planners because it allows the same basic timetable to be applied every hour. Additional tracks or passing loops can be built on rural rail lines precisely where needed. Planners can also use the stable timetable structure to prioritise investment in new infrastructure: for example, speeding up travel times to allow trains to arrive for an hourly pulse, and thereby reducing the number of vehicles and drivers required to operate the service. Local bus operations also benefit from being given consistent time windows between rail departures in which to complete their routes. As in most developed countries, where the largest transport running cost is labour, maximum use can be extracted from each vehicle and driver's time, even by extending routes to use up spare time. Due to the timetable's repetition, **detailed contingency and recovery plans can be prepared for a variety of possible problems** in a single hour of rail operations, and then applied across the day. Apart from the positive impact on capacity, the application of such concept can also help harmonising speed profiles between the trains, identifying points where fast trains should stop and take into account the determined timetable to overtake slower trains. It can also support in determining which stations can have some other tracks to overtake.

Finally, the German Presidency of the EU proposed to introduce this approach at a European scale in order to launch the TEE 2.0 service. This proposal has been supported by the International

[47] https://blog.sbbcargo.com/22707/taktfahrplan-fuer-gueter-stabil-gestartet/

railway platform with the intention to develop further the **concept of a European regular interval timetable ("Europatakt")**.

➔ **Revitalizing the European single wagonload**

Single wagon load is the possibility to order instead of a whole train few wagons to transport freight by rail, ideally from siding to siding. This was in the past decades of the railway an important part of the rail freight services. However, due to the high costs of the single wagon load compared with the road transport, the offer has been reduced significantly in the last decade. Nevertheless, according to the study commissioned by the European Commission in 2015 "On Single Wagonload Traffic in Europe – challenges, prospects and policy options"[48] and the study for the German federal parliament[49], the single wagonload still represents today a bit less than 40% of rail freight volumes with high disparity across Member States but is in constant decrease over the last decades (its share was more than 50% in the beginning of the century). This decrease is mostly because this type of service often does not cover its production costs and due to the complexity of marshalling operations. In this same study from the European Commission, recommendations have been listed to ensure the sustainability of the single wagonload business model.

The key obstacles for the single wagon load are changing markets for goods transport (e.g. coal and metallurgy products) and the high costs for the specific infrastructure (private sidings, freight stations, shunting yards) for the single wagon load services. To improve the efficiency of the single wagon load, some technical (e.g. reduced loading time, increased load factors, improved efficiency in shunting) and operational measures (e.g. optimized network) have to be applied to lower the costs of this specific market segment.

However, the introduction of DAC technology could significantly reduce the costs of the single wagonload business model and reduce its operational complexity. With this technology, it could be easier to find synergies between customers to share handling costs (clusters of companies). This rail offer could quickly become much more attractive again meaning that appropriate efforts should be made in order to maintain its activities and develop it further in the mid-term. It is necessary **to stabilize the number of marshalling yards in operation** which are critical for single wagonload operation. A tracking system of wagon would be necessary to increase the quality of

[48] https://ec.europa.eu/transport/sites/transport/files/2015-07-swl-final-report.pdf
[49] https://www.bundestag.de/resource/blob/675844/a5c87be3703a4c272e8b5abd714783c4/WD-5-089-19-pdf-data.pdf

service as it is done in all the other modes of transport. In addition, regular freight train services on routes with high demand can also contribute to increase single wagonloads traffic.

Finally, some stakeholders from the rail sector created an offer X-rail[50] to link the single wagon load systems of 7 rail operators, aiming to make European Single Wagonload a more competitive and more sustainable alternative to road transport. The network covers the networks of CFL cargo, DB Cargo, Fret SNCF, Green Cargo, Lineas, Rail Cargo Group and SBB Cargo. This network allows a single access to these services to customers, served by networks of these members.

VI. A leadership with a global vision of the logistic chain's impact

➔ Ensuring a strong coordination between logistic stakeholders

With the sustainable and smart mobility strategy, the European Commission introduced the objectives to increase rail freight traffic by 50% by 2030 and double by 2050[51]. The objectives of the past Transport White Papers have not been fulfilled partially due to a lack of global vision of the logistic chain. There is a clear need for the creation of a platform for senior management – **an executive committee for logistics** – with representatives from the different sectors and authorities (local, national and European level). Indeed, with digitalization of the transport sector in general and the railway in particular, new management and governance models and skills will be needed with responsibility for all new technological developments.

One of the missing link in the railway sector is not only geographical, it is also regarding the mindset. In order to improve the railway sector, a European mindset is needed but also a better understanding of the logistics challenges. Some specific training sessions for senior managers on the link between railway and logistics, the need of intermodality and multimodality would be necessary to raise awareness.

The initiative Rail Freight Forward[52] - a coalition of rail freight operators with the ambition to increase the modal share of rail freight in Europe from currently 18% to 30% by 2030 – is positive but still limited to the railway sector with no overarching view on the logistics challenges as a

[50] https://www.xrail.eu/
[51] Compared to 2015.
[52] https://www.railfreightforward.eu/

whole. On the other hand, the initiative 4F « Fret Ferroviaire Français du Futur »[53] - a coalition gathering railway stakeholders but also combined transport or maritime stakeholders with the ambition to double the rail freight modal share in France by 2030, is also positive but limited to the French territory. A European coalition with a broader participation i.e. not limited to the railway stakeholders could be created with the task to elaborate a **concrete roadmap to increase railway freight volumes in order to reach the political objectives** established in the sustainable and smart mobility strategy. In addition, to this roadmap, this committee could also regularly monitor and review the **European Union connectivity** by examining options for greater transport connectivity between Member States from a multimodal point of view.

➔ **Monitoring and reporting the decarbonisation of the transport sector**

As stated in the introduction of this paper, the impact of transport on environment and society is very high as it represents around **25% of Europe's emissions** and it is the only important sector that has not seen its emissions reducing over the last years. Considering these two aspects, a **mechanism of monitoring and reporting on the decarbonisation of the transportation sector** by the Member States on their territories is necessary. Regulation (EU) No 525/2013[54] of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions or Monitoring Mechanism Regulation (MMR) has been established for this purpose. With this Regulation, the Member States are required to submit information on national climate policies and measures to the European Commission (EC) every two years. The European Environment Agency receives and compiles this information[55] together with annual GHG inventory submissions including transport sector emissions broken down by transport mode.

However, in order for this reporting and monitoring mechanism to be fully comprehensive, it would be beneficial if railway undertakings could step up their reporting on environment and energy aspects. Indeed, the quality of the reporting differs strongly between the different entities here. Especially, it would be interesting to report the **GHG intensity of the electricity used by railway undertakings** so that it does not need to be inferred from other datasets.

[53] https://www.fret4f.fr/wp-content/uploads/2020/06/4f-rapport.pdf
[54] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R0525
[55] https://www.eea.europa.eu/themes/climate/national-policies-and-measures

In addition to this mechanism, a common European environmental labeling for the different transport modes should be developed. The European Aviation Safety Agency (EASA) has received a mandate to develop such environmental labeling for the aviation sector. This labeling should be able to increase transparency in making more sustainable choices for the aviation sector and, eventually, allow for intermodal comparison. A **European environmental labeling for transport allowing for intermodal comparison** which could be integrated eventually in ticketing system and in the logistics offers would be the next step and should involve more stakeholders e.g. European Union Agency for Railways, European Environment Agency, European Maritime Safety Agency.

CONCLUSIONS

'Only with rail we will achieve our climate goals. We want more goods to be transported by rail', Angela Merkel, December 2020.

The freight sector is strategic to decarbonize the European economy and reach the environmental goals. It is a sector that is called to keep growing with the rail sector ideally positioned to support a sustainable growth. If the European Union wants to maintain its leading position in the railway field, it will need to accelerate its actions in favor of the rail sector and in particular through:

- ➔ Creating more awareness on the benefits of the rail in order to encourage more customers to use it;
- ➔ Ensuring a level playing between all modes of transport with a regulatory neutrality and setting clear CO_2 reduction targets per mode of transport;
- ➔ Assessing the demand and necessary provision of rail freight services (capacity, price, quality of service) in order to strategically plan the investments in rolling stock, rail and terminal infrastructure, ERTMS and corridors for 740m trains;
- ➔ Putting the customers as the central focus and looking for the optimum transport mix;
- ➔ Investing massively in technology to modernize the railway sector and developing digital solutions;
- ➔ Developing a truly overarching multimodal strategy in order to develop a green logistic chain and to decarbonise the last mile connection;
- ➔ Facilitating the access to the rail offer and making it more attractive by building institutions for better managing traffic and capacity management at European level;
- ➔ Building redundancies to ensure that the European transport system is resilient;
- ➔ Building a strong leadership with a global vision of the logistic chain.

Securing the leading position of the railway sector is not only strategic from an economic point of view but it is also essential to achieve climate neutrality through the long-term establishment of net-carbon and resilient economy.

This would lead to the establishment of a **new approach to logistics where rail will play a crucial role in a greener multimodal logistic chain.**

ANNEX

Annex 1 Summary table of proposed measures

A level playing field for all transport modes	Achieving a fair and mode-neutral regulatory environment	1. *Introduce a fair road pricing to apply the "user pays" and "polluter pays" principles in order to fully internalize environmental costs.*
	Investing strategically on lines	2. *Set strategic priorities to fund projects based on a European and holistic approach to the transport system.*
		3. *Create incentives and support private investments on transshipments facilities for industry.*
Modern railways using the most recent innovations	Decarbonising the last segments of the railway network	4. *Pursue the investments in the electrification of the railway network.*
		5. *Invest in Fuel Cell and Hydrogen technology to decarbonise non-electrified routes.*
		6. *Identify segments of the railway network where hydrogen refueling stations would be necessary.*
		7. *Promote less energy demanding modes of transport.*
	Modernising the railways through technology	8. *Accelerate ERTMS deployment.*
		9. *Invest in ATO.*
		10. *Upgrade railway vehicles with DAC technology.*
		11. *Adapt the railway infrastructure to longer trains.*

A green logistic chain through a multimodal strategy	Favoring the Intermodal and Combined transport	*12. Analyse the demand for terminal capacities on all freight corridors and ports.*
		13. Invest to improve craneability with potential design constraints on new semi-trailers.
		14. Adopt ERA recommendation on combined transport.
	Developing a Sea-Rail-Waterways strategy at EU level	*15. Draft a synergy strategy between maritime, waterways and railway sectors.*
		16. Launch a legislative initiative covering interoperability between modes of transport.
	Tackling the last mile challenge: urban railway logistics	*17. Support investments in joint multimodal logistic centers.*
		18. Study the possibility to create a Land Transport Agency or a Multimodal Agency
An easy access to the rail offer	Developing a marketplace for rail	*19. Integrate the rail offer in the market places.*
		20. Foster the use of the platform for rail data freight exchange.
	Identifying the missing links	*21. Launch a study to get an overview on the bottlenecks for the railway freight sector.*
		22. Build a master plan for the necessary investments on the infrastructure necessary to improve freight capacities.
	Identifying the market of tomorrow	*23. Study the markets over which the rail could increase its presence.*
The customers as the central focus	Ensuring an end-to-end path allocation	*24. Create a Eurocontrol for rail.*
	Europeanising the concept of regular timetables	*25. Develop further the concept of a European regular interval timetable ("Europatakt").*

	Revitalizing the European single wagonload	*26. Stabilize the number of marshalling yards in operation.*
A leadership with a global vision of the logistic's chain impact	Ensuring a strong coordination between logistic stakeholders	*27. Create an executive committee for European logistics.*
		28. Elaborate a roadmap to increase railway freight volumes in order to reach the European political objectives.
	Monitoring and reporting the decarbonisation of the transport sector	*29. Report GHG intensity of the electricity used by railway undertakings.*
		30. Create an environmental labelling for transport allowing for intermodal comparison.