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Information and analytical digest

RAILWAYS AS A GREEN ALTERNATIVE: IMPACT OF THE ENVIRONMENTAL AGENDA ON THE MODAL SHIFT

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INTRODUCTION

With economic development, environmental, social and governance (ESG) issues are becoming increasingly important for many sectors, including transport. The transport sector is one of the pillars of international trade and the modern world as a whole, and rail transport is a crucial component of this ecosystem.

The rail transport has a number of advantages over other modes of transport, including environmental ones. According to ERAI, at the end of H1 2021 the amount of direct CO2 emissions from transportation of containers on the China-Europe-China railway route was 22.5 KT. However, direct emissions from the maritime, road and air transport of TEU in the same amount would be 107.3 KT, 1,999.7 KT and 11,862.3 KT, respectively.

Transportation of goods by rail considered to be a stable and reliable method of delivery ensuring the supply chain predictability has an advantage over the maritime and air transport in terms of speed, safety, efficiency and, to a large extent, environmental friendliness. It is only for environmental issues, and climate neutrality in particular, more and more companies are integrating ESG factors into their strategies. By contributing to the reduction in greenhouse gas emissions as well as to safety and corporate sustainability, rail transport becomes an important issue in the ESG agenda.

COVID-19 and related restrictions have resulted in many obstacles to doing business as a going concern, but several factors of the same have demonstrated benefits of the rail transport. Against a backdrop of structural imbalances in air and maritime transport, the stability of railway service and additional price advantages have led consignors to switch to rail transport, especially in the Eurasian rail transit corridor. According to ERAI in April 2020, freight volumes were doubled for the first time on the China-EU-China route with a monthly volume of 41,200 TEU. In 2020, the volume of traffic on the Eurasian route amounted to 546,900 TEU, an increase of 64% compared to 2019. Of these, 198,800 TEU (+45%) were transported to China and 348,100 TEU (+77%) to the EU.

The pandemic has thus contributed to the expansion of Eurasian transit containerised rail transportation, but maintenance of achieved positions and further expansion of the rail industry is directly related to the rail transport integration in strategic objectives to reduce and/or eliminate ESG risks and the extent to which market players are prepared for significant changes: governments, infrastructure, transportation providers and consumers.

WHAT IS ESG? ANY RELEVANCE FOR CONSIGNORS?

ESG (Environmental, Social, and Corporate Governance) as a combination of environmental, social, and corporate governance reflects a non-financial component of business. This term originates from the investment industry and it allowed investors to evaluate social responsibility of companies. Today, ESG principles are implemented as part of companies' non-financial reporting and play a fundamental role in attracting investments, building relationships with governments, regions and host cities, local residents, other companies and equally important customers and consumers.

There are three key parts of ESG. Corporate governance reflects the company's compliance with best firm management standards and practices. It covers the composition of the board of directors, transparent top management incentive plan, and adherence to responsible lobbying, recruiting and HR practices. In essence, everything that determines efficiency and healthy climate within the firm.

Social governance, like environmental one, is an external performance measurement of the firm and indicative of the firm reputation with consumers, brand inclusiveness (reputation with different social, gender and class groups), relations with local residents and authorities in locations where the firm is present. Both influence dramatically the preparedness of investors to invest in the company and consumer loyalty.

ESG PRINCIPLES AND COMPONENTS

Source: prepared by the authors.

By developing corporate ESG strategies for environmental governance, companies aim to increase a business value and mitigate potential reputational, political and regulatory risks. However, there is no universal standard to rank companies and their adherence to ESG principles, but such adherence is already largely considered by investors in the analysis of companies. S&P Global, for example, conducts ESG assessments of companies and highlights an exponential increase in the number of regulations related to the environmental and social responsibility of companies.

ESG procedures, criteria and indicators are determined by companies in accordance with recognised ESG reporting systems. Today, the Global Reporting Initiative (Global Reporting Initiative, GRI) is the most widely used non-financial reporting standard. However, there is a number of other guidelines in use. Non-financial disclosure directives are also adopted by the European Union (2014/95/EU).

ESG REPORTING SYSTEMS

Source: FBK Grant Thornton.

The environmental agenda has been translated into the creation of guidelines for disclosure of corporate environmental information. The standards of the Task Force on Climate-Related Financial Disclosures (TCFD) have achieved universal application are now universally applied and endorsed by the G20 leaders under the auspices of the UN. Meanwhile, the industries considered to be most exposed to significant climate risks have the highest level of TCFD disclosure.

The Task Force addresses physical, liability and transition (transition to a low-carbon economy) risks associated with climate change, and analyses the effective disclosure for different sectors of the economy. Companies are also advised to use scenario analysis: options to achieve certain targets, e.g. for emission reductions.

Another popular tool for assessing the environmental performance of companies is the rating of individual companies by S&P Global. Based on the findings of the Task Force, the ESG assessment procedure also involves assessing whether the companies are prepared for environmental transformation and scoring all three ESG components on a 100-point scale.

Thus, the ESG analysis is introduced by investors. However, in order to remain competitive, companies should implement globally accepted ESG reporting standards, which in turn requires compliance with advanced environmental practices: implementing action plans to reduce the carbon footprint, creating mechanisms to monitor emissions, determining targets for their reduction, and accounting direct and then indirect emissions, that is, not only in production activities, but throughout the company's supply chain and logistics.

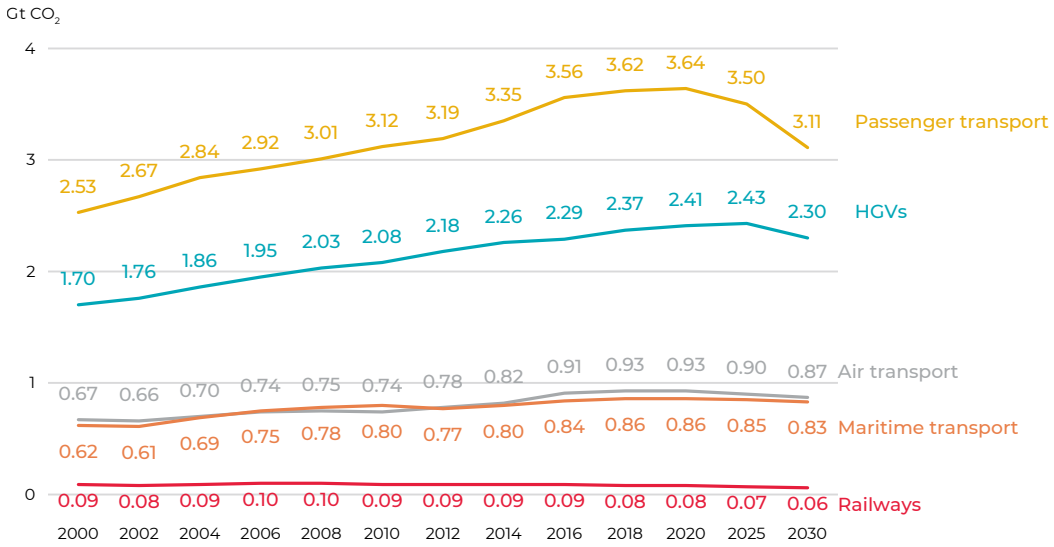
ENVIRONMENTAL BENEFITS OF RAILWAYS

The environmental factor is growing in importance as environmental problems increase and pace of human-caused climate change accelerates across the globe. Reducing GHG emissions is at the top of the global environmental agenda. At the international level, the process is governed by the UN Framework Convention on Climate Change, but for countries it is voluntary, multi-speed as the countries that are lagging behind are entitled to develop in line with their national objectives. That is why the environmental policy of the European Union is now the world's main reference point for shaping a green growth vector.

The transport sector is a major source of GHG emissions. It currently accounts for 24.6 % of total EU emissions and its decarbonisation, i.e. reduction of CO2 emissions, is slower than in other sectors such as energy and industry. However, emissions from the transport sector are not evenly distributed among the modes of transport. Road transport (cars, trucks and buses) accounts for 3/4 of CO2 emissions from the transport sector, followed by air transport, maritime transport, and rail transport.

CO_2 EMISSIONS BY MODES OF TRANSPORT

Forecast for 2025 and 2030 in the sustainable development scenario

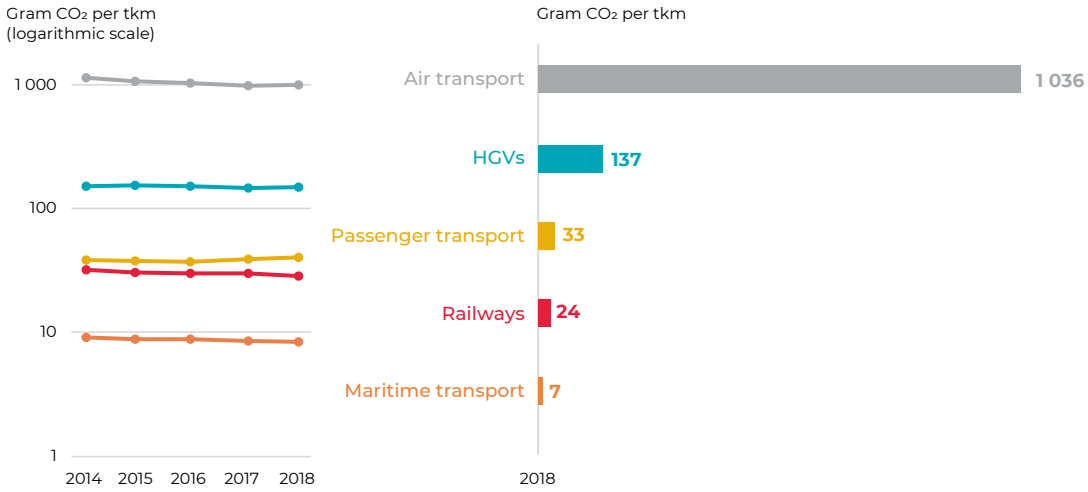


Source: International Energy Agency.

The decarbonisation of the transport sector, in which railways have a decisive role, is one of the main objectives of the European Green Deal to achieve climate neutrality in the EU by 2050. In particular, this rail freight traffic should be doubled and TEN-T multimodal network for sustainable and intelligent transport should be complemented by a network of high-speed railways. The EU modal shift targets meet the GHG emission efficiency targets for freight transport. According to the

2020 study conducted by Fraunhofer ISI and CE Delft upon request from the European Environmental Agency on the basis of 2014-2018 data, emissions from rail transport per tkm are almost 6 times lower than, for example, from HGVs. Air cargo today stands out as the transport with the highest emissions.

AVERAGE GHG EMISSIONS BY MODES OF TRANSPORT, EU-27



Source: European Environmental Agency.

The results presented fully support the assumptions underlying the EU policy on modalshift. It should be noted that not all modes of transport are equally suited to different transportation tasks, and modes of transport are not always interchangeable due to geographical and infrastructural features, as well as the criticality of delivery times (in the case of perishable goods, for example). Achievement of the EU objectives therefore depends to a large extent on the adaptability of Member States' transport systems.

The transport sector plays a key role in the achievement of the EU carbon neutrality goals, which affects all modes of transport. The transport sector is among those that have increased their emissions against the background of overall policies to reduce them. The EU Emissions Trading Scheme (EU ETS) is being expanded with the increase in the price of emissions. At the moment it covers about 45% of all sources of CO2 emissions in the EU. On 14 July, the European Commission published a draft directive for the expansion of the EU Emissions Trading Scheme (EU ETS) for the transport sector, which is expected to be soon legally enshrined in the Fit for 55 package (achieving a 55% reduction in emissions in 2030 compared to 1990 levels).

Air transport, which accounts for 2-3% of global CO2 emissions, was included in the EU Emissions Trading Scheme in 2016, but due to the implementation by the International Civil Aviation Organisation (ICAO) of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), only flights within the European Economic Area were included in the European Emissions Trading Scheme without international flights. This exception will cease to be in effect in 2023, and CORSIA will be integrated into the EU ETS for European carriers, as the

EU plans extend far beyond the ICAO programme. That is, once the emission levels set for 2019 have been exceeded, European carriers serving international flights will have to buy the right to additional emissions through auctions or offsetting schemes.

A separate cap-and-trade system will be established for road transport and construction sector, with responsibility being shifted to fuel suppliers that will account for their supplies and pay for carbon intensity of the fuel supplied. The scheme will be fully implemented from 2026 in tandem with efforts to enhance regulation of car manufacturers.

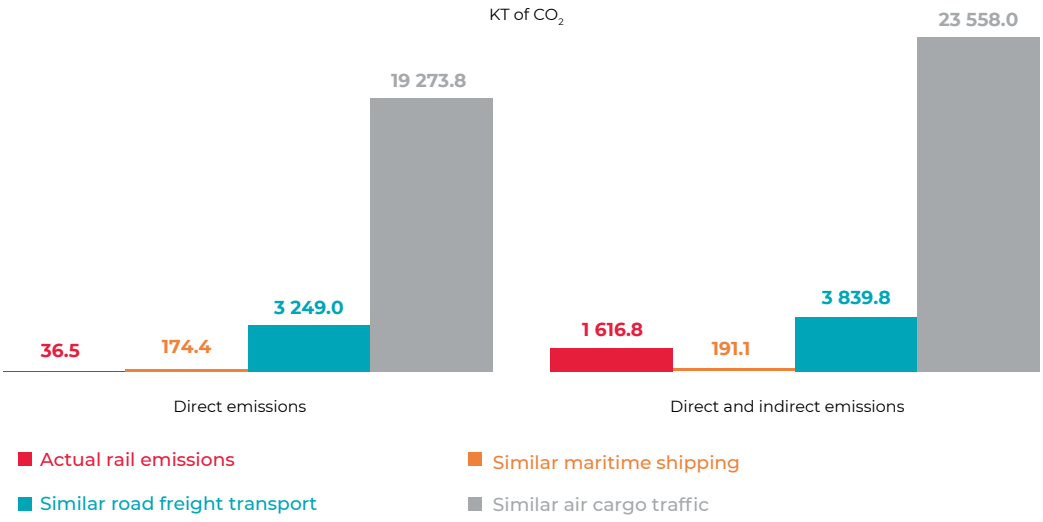
Maritime transport is included in the current EU emissions trading scheme, although maritime transport generates lesser emissions, accounting for around 13% of emissions from the transport sector. The scheme will include emissions from vessels of any flag over 5,000 tonnes, which enter European ports while making voyages in the EU or international voyages starting and ending outside the EU. This also include emissions during berthing at the EU ports. The initiative aims at the transition of maritime carriers to low-carbon fuels. The scheme will be implemented during 3 years. The European Commission plans to gain around USD 10 bn from the expansion of the emissions trading scheme for international air and maritime transport.

However, rail transport is already fully integrated into the scheme. According to the Community of European Railway and Infrastructure Companies (CER), railway companies pay around 110 million euros a year for indirect CO2 emissions due to power generation from dirty energy sources (around 60%). According to the railway companies, this situation was unfair, as road transport is currently not included in the scheme, and only 15% of air transport is included due to legislative limitations. Thus, the rail transport already exists in the new environment and carbon regulation will be further tightened through extending it to other modes of transport, which will strengthen the competitive positions of railways.

According to ERAI CO2 counter, an indicator of environmental benefits of rail transport for China-Europe-China containerised transit traffic, air transport is the least environmentally friendly mode of transport in terms of both direct and indirect air emissions. For 546,902 TEU transported along the Eurasian railway route in 2020, railways are the most environmentally friendly choice, especially in terms of direct emissions. Maritime transport is also environmentally friendly, but it is necessary to take into consideration that t apart from carbon dioxide (CO2) vessels emit other greenhouse gases such as sulphur dioxide (SOx), the emissions of which are reduced by efforts of the International Maritime Organisation (IMO).

CUMULATIVE EMISSIONS FROM FREIGHT TRANSPORT ON THE EURASIAN RAIL TRANSIT ROUTE IN 2020

546,902 TEU converted into KT of CO_2



According to SNCF Réseau, a subsidiary of French Railways, the French transport sector accounts for 31% of emissions, of which rail transport constitutes less than 1%. However, the share of rail transport in the transport sector remains low, with only 10% of passengers and cargo transported by rail. Thus, the necessary modal shift to the rail as the most environmentally friendly mode of transport is accompanied by enormous untapped potential of rail transport.

According to Rail Delivery Group rail freight brings economic and social benefits to the UK in the amount of GPB 2.45 bn annually. In addition, each tonne of freight transported by rail produces 76% less carbon emissions compared to the road transport, with one freight train being the equivalent of 110 trucks. Overall, rail transport obviates the need for seven million travels by road a year.

Although rail transport is seen as an important part of overall emission reduction, its potential for freight is somewhat limited, especially for short distances where road transport predominates. According to the German Federal Environmental Agency (UBA), in an ambitious scenario rail freight will account for no more than 30% of the country's total freight traffic by 2050, up from 18% in 2016. This represents the maximum potential for transfer to rail freight traffic and cannot be realised without significant capacity expansion (lines, hubs, terminals) compared to the existing capacity.

Digitalisation of the railway sector is also crucial: the automation of various processes from train dispatching to incident handling offers significant capacity, efficiency, safety and sustainability benefits to passengers, operators, regulators and railway manufacturers. Digitalisation has a potential to increase the market share of rail freight from its current level of 19% to 30% by 2030, as envisaged in the EU strategy. However, in order to realise this potential, governments need to introduce a set of coordinated reforms, including the adaptation of legal and regulatory framework.

Electrification is crucial for railways. It is the use of electric traction, especially in case of electricity generation based on renewable energy sources, that allows railways to gain environmental benefits in their entirety. The rail industry in Europe has already made great strides in improving air quality by developing electric and alternative power units to replace diesel-powered locomotives.

German government plans to electrify 70% of the rail network by 2025 and to take additional measures to develop the rail transport. To reduce emissions on less frequented and non-electrified rail lines, where diesel fuel is currently used, hydrogen fuel cell trains are expected to be operated as they are currently recognised as the most promising type of goods train for climate neutrality. In 2018, Germany rolled out the first Coradia iLint hydrogen-powered train built by Alstom. This technology completely eliminates emissions into the air, a process that leaves steam and water as the only emissions. Excess energy is stored in ion lithium batteries on board the train. Trains are equipped with two motors, which are powered not by the overhead contact network, but by energy source in the train itself - hydrogen tank and fuel cell installed on the train roof produce electricity through a combination of hydrogen and oxygen.

Hydrogen trains can be a major flagship for sustainable development of the transport sector, but this requires minimising the carbon footprint of the entire energy chain needed to drive the trains. Since the hydrogen in the tank on the train roof is produced by water electrolysis, which requires a lot of power, power should be generated in an environmentally-friendly way, for example by wind power plants.

The main obstacles to this are, firstly, several types of hydrogen depending on the source of origin: “green” hydrogen (from renewable energy sources), “grey” hydrogen (mainly from gas), “brown” hydrogen (from coal) and even “blue” hydrogen (derived from fossils with carbon capture). That is, not all hydrogen is “pure”. Secondly, special infrastructure is required for use of hydrogen, considering the high safety risks of handing this fuel.

There is a growing environmental burden on the transport sector and emergence of the environmental factor as a key factor for all modes of transport. While for some, ecology becomes a constraint that should be adapted to, others, such as railway freight sector, view the environmental factor as a new competitive advantage.

ESG LOGISTICS AND MODAL SHIFT

Commitment to global sustainability goals is becoming a new reality for the corporate sector as the climate emergency intensifies. Availability of appropriate and well-established sustainability standards and their transparency improves the reputation of companies and enables stakeholders to clearly understand how the company mitigates negative environmental and social impacts. The shift to rail can also be reflected in corporate ESG strategies.

In order to analyse how important the environmental benefits of using rail transport as the most sustainable and environmentally friendly alternative to sea, air and road transport are to consignors and consignees, several companies were selected. Top 20 companies whose revenues are most dependent on China, both in terms of total revenue and revenue share, were taken as a basis. Further companies least predisposed to containerised rail transport, including on the China-Europe-China route, were excluded from the list. This is followed by an assessment of the importance of green logistics for companies if they have sites or significant share of sales in China.

To assess the significance of the modal shift to railways, taking account the role of environmental factors, companies' positions in the S&P Global ESG and Sustainalytics ratings (ESG Risk Ratings) are used. S&P rating is one of the most recognised international ratings, which assesses the profile of companies by comparing selected performance against the industry average, as well as the company readiness, which means the incorporation of ESG objectives into the strategy and corporate culture, adoption of an action plan, etc. It is used to compile the DowJones Sustainability Index (DJSI). Sustainalytics rating is also a tool recognised by international organisations among others, and includes an assessment of ESG risks to the company and management readiness to control these risks.

Commodity groups of the selected companies are then highlighted using the open data. Given the transnational nature of companies and the diversification of commodity groups according to the principle of reductionism commodity groups exported from the EU countries to China, or common commodity group having a two-digit name in FEACN are taken as a basis. The current status and potential for modal shift is then assessed on the basis of available national and Eurostat statistics on exports to China by mode of transport. The potential assessment is also influenced by S&P Global rating, significance of environmental risks in Sustainalytics rating, and current composition of supply chain modalities.

Swatch

Swatch Group is the world's largest watchmaker, accounting for around 1/4 of the global market. The group includes brands such as Omega, Breguet, Harry Winston, Blancpain, Glashütte Original and others, mostly in the luxury segment. The group also produces components for watches of other brands. The company has manufacturing facilities in Switzerland (Omega, final assembly) as well as in the USA and Czech Republic (EM Microelectronic, microelectronics). According to several sources, some basic components are manufactured in China and purchased by the company. According to the official report for 2020, service centres and outlets are located in China, mainly in Shanghai and Hong Kong. In addition, it is China that is emerging as a key market for products: in 2020, 35% of revenue was gained in China.

The company is introducing ESG principles. However, the company has a low ESG risk profile, particularly in terms of the environmental component (16.9 in Sustainalytics and 0.7 for environmental component), but low S&P ESG rating is worse than the market, which prevents it from being included in the gold, silver or bronze basket. The company assesses the entire lifecycle of the materials used in production as part of its environmental protection and has set corporate goals to reduce its carbon footprint (by 32% in 2030 compared to 2013). At the moment, the company only assesses direct CO2 emissions, i.e. from production and shop operations, without estimating emissions from the entire supply chain.

Swatch group exports products from Switzerland to China primarily under commodity group 91 (9101, 9102)—wristwatches, including precious watches. Switzerland exported HS 9101 and 9102 goods in the amount of about EUR 2.2 bn to China in 2020. In terms of value, Switzerland exports are distributed almost equally between road and air transport, with a small share of other transport modes. In the engineering products category (NST), rail represents around 0.6% of Swiss exports in value terms. Obviously, for exports to China, this figure is close to zero.

The group's interest in switching to China-Europe-China rail transport can be evaluated as low. The low interest in the current ESG implementation is due to the lack of assessment of indirect emissions and negligible environmental risk. However, the inclusion of a number of the group's brands in the luxury segment requires an increase in greening efforts, but does not put them on the list of priorities. The specifics of Swiss exports also indicate a low interest in the rail transport.

Company	Swatch Group (Switzerland)
Product line	Wristwatch and wristwatch accessories, including those made of precious metals
Country of origin	Switzerland
Chinese market share in revenue	35%
S&P Global ESG Risk Rating	N/A
Sustainalytics ESG Risk Ratings (for environmental factors)	16.9 (0.7)
ESG transformation	Indirect emissions are not reported
Commodity group	9101, 9102
Exports of commodities from the country of origin to China (million euro)	2177
Share of rail transport in exports of selected commodities to China	≈0%
Modal shift potential	Low

Richemont

Swiss holding Richemont is one of the world's top three luxury manufacturers, owner of Cartier, Chloé, Van Cleef & Arpels International, Montblanc, and others. China accounts for around 1/4 of the company's sales. Chinese HQ is located in Hong Kong. Holding participates in the UN Global Compact and monitors the implementation of adopted sustainable development indicators under the UN procedure. In addition to responsible production, the holding company follows the principles of green distribution: rejection of the use of plastic in the delivery of goods via e-commerce. E-commerce is a crucial area for the company: in 2020, online sales amounted to more than 2.4 bn euros (15% of holding sales), which makes the company directly interested in green ways of delivering goods.

However, the company has an extremely low environmental risk profile and is not indexed in S&P ratings, apparently due to the narrow luxury segment it operates in. Meanwhile, the company seeks to present itself as an environmental leader, which is important to retain its target audience, and has a partnership agreement with Alibaba for online logistics.

Commodity groups under headings 4202 and 4203 articles of apparel and clothing, of leather and accessories are main commodity groups for the holding. As with Swiss watches, only a small proportion, around 1%, of the country's light industry products are exported by rail. Exports to China are even lower. Given the premium segment, it is clear that most Swiss products are exported to China by air, which is the least environmentally friendly alternative and contradicts the company's decarbonisation policy, which implies that there is some potential interest in the modal shift, but at an average level.

Company	Richemont (Switzerland)
Product line	Luxury articles: watches (31%), jewellery (42%), clothing (13%), accessories
Country of origin	Switzerland
Chinese market share in revenue	26%
S&P Global ESG Risk Rating	N/A
Sustainalytics ESG Risk Ratings (for environmental factors)	11.5 (0)
ESG transformation	The principles of environmentally friendly distribution of goods, especially packaging, have been introduced
Commodity group	4202, 4203
Exports of commodities from the country of origin to China (million euro)	52
Share of rail transport in exports of selected commodities to China	≈0%
Modal shift potential	Average

Moncler

Another company in the premium outerwear segment is Italian Moncler, specialising in sportswear, including for colder conditions. Although there are some partner plants, the company's main production facilities are located in Eastern Europe (Romania, Hungary, etc.), and around 18% of products is sold in China. In its business, the firm follows a well-developed environmental policy, usually holding leading positions in sustainability in its industry. The company has a logistics hub in Castel San Giovanni (Emilia-Romagna).

In order to improve green logistics, the company selects the shortest delivery routes to optimise and reduce its carbon footprint and to use the most environmentally friendly modes of transport, which has already led it to move away from air freight. This is a breakthrough decision, given that in group 62 Articles of Apparel Sewn around 1 bn euros of 1.2 bn euros of the EU exports to China are transferred by air. The share of air freight is gradually declining in this commodity group, and rail transport showed a significant increase from 200,000 to 2 million euros between 2019 and 2020.

The company is included in gold cluster of S&P ESG. The modal shift is also supported by the company's consumer focus on environmental protection. The company has a low ESG risk, but the modal shift is relevant as the company is currently interested in decarbonisation of its supply chain and movement away from the polluting means of transport.

Company	Moncler (Italy)
Product line	Premium clothing
Country of origin	EU (Italy, Romania, Hungary, Bulgaria)
Chinese market share in revenue	18%
S&P Global ESG Risk Rating	Gold
Sustainalytics ESG Risk Ratings (for environmental factors)	10.4
ESG transformation	Attention to the environment, focus on sustainable logistics, choice preference of green modes of transport and monitoring
Commodity group	62
Exports of commodities from the country of origin to China (million euro)	1213
Share of rail transport in exports of selected commodities to China	≈0.2%
Modal shift potential	High

Adidas

Due to the global nature of its business, Adidas Group has production facilities all over the world (adidas, Reebok brands). The holding company is the largest clothing and footwear manufacturer in Europe and the second largest in the world. China accounts for 27% of the holding's production capacities, which is about 337 plants. China accounts for 15% in the company's footwear production; 20% in apparel; and 36% in accessories and equipment. The group has a well-established network of 64 distribution centres and directly owns about half of them, which has enabled it to successfully adapt to disruptions due to the coronavirus, as well as to develop its e-commerce segment. The company has implemented the UN Sustainable Development Goals (SDGs) and monitors the reduction in CO2 emissions, energy, water consumption and industrial waste.

The company's key product segments are included in commodity groups 95, 64 and 62. As group 62 is reviewed above, the commodity groups Toys and Sports Equipment (95) and Footwear, Lap Socks and Similar Articles (64) are considered. With exports from the EU to China in the amount of 1 bn euros rail accounts for around 2% of the export value in both categories. At the same time, the composition of modalities is characterised by a relatively small increase in rail freight traffic. Footwear is predominantly transported by air, and toys - by sea.

The group is included in S&P ESG bronze pool. At the same time, the company has a low risk profile as compared inter alia to major competitors in its niche. However, as far as is known, the company is not active in transforming its supply chains, but experiences serious failures in maritime logistics, and this has made it search for alternatives. However, in general the potential for modal shift due to decarbonisation can be regarded as average.

Company	Adidas AG (Germany)
Product line	Sportswear
Country of origin	EU
Chinese market share in revenue	17%
S&P Global ESG Risk Rating	Bronze
Sustainalytics ESG Risk Ratings (for environmental factors)	13.3 (2.2)
ESG transformation	SDGs have been implemented, production emissions are monitored
Commodity group	64, 95
Exports of commodities from the country of origin to China (million euro)	1008
Share of rail transport in exports of selected commodities to China	≈2%
Modal shift potential	Average

Infineon

German Infineon is a manufacturer of microchips for telecommunications. It ranks among the top 10 semiconductor manufacturers and is the largest supplier of microchips to the automotive industry. It is a former subsidiary of Siemens. Much attention is paid to green energy in the transport sector, including freight transport. Meanwhile, 37% of the company's revenue comes from its collaboration with China, including Hong Kong and Taiwan around 2 bn euros. Infineon partners include Chinese companies such as Alibaba Group, Baidu and BYD Auto. The company's production facilities are located in China (Jiangsu Province) and in Europe (Regensburg, Dresden, Warstein, Villach, Cegled). The company adheres to 10 principles of the UN Global Compact and aims to move to carbon neutrality by 2030. In doing so, the company monitors its environmental impact and takes into account emissions from transportation.

The company's main export commodity groups are 8541 (diodes, transistors and semiconductors) and 8542 (electronic integrated circuits). The share of rail freight transport from the EU to China is negligible in both categories; air transport is dominant, which is logical given the current lack of supply in the market.

Infineon is included in the «bronze» cluster of S&P, and therefore it is a fairly responsible ESG company. In addition, the company takes indirect emissions into account and is already decarbonising logistics in Europe and is therefore interested in continuing this work, given that one third of its sales is represented by China. ESG risks are key risks for the company, that is why it is interested in transferring to the rail transport.

Company	Infineon (Germany)
Product line	Semiconductors and microchips, primarily for the automotive industry
Country of origin	EU (Germany, Austria, Hungary)
Chinese market share in revenue	37%
S&P Global ESG Risk Rating	Bronze
Sustainalytics ESG Risk Ratings (for environmental factors)	17.5 (7.9)
ESG transformation	Accounts indirect greenhouse gas emissions, including from internal and external logistics
Commodity group	8541, 8542
Exports of commodities from the country of origin to China (million euro)	9370
Share of rail transport in exports of selected commodities to China	≈0.02%
Modal shift potential	High

OSRAM

OSRAM, another former subsidiary of Siemens, is a designer and manufacturer of components for semiconductors as well as lighting equipment. In 2019, it was taken over by Austrian AMS, which entailed a split into three business units: opto-semiconductors (LED lamps), lighting equipment for the automotive industry, Internet of Things solutions. The company has its own production facilities in Germany, China (Jiangsu) and Malaysia. Despite the application of ISO 14001 (environmental management system) and ISO 50001 in Europe (energy management), the company does not plan to reduce emissions and maintain accounts of indirect emissions, including emissions from logistics.

The company's main export commodity groups are 8539 (light bulbs), 9405 (lighting equipment), which are niche ones. Goods in 8539 group are transported primarily by air, but the share of rail transport has increased significantly compared to 2019: from 175 thou euros to 5.9 mn euros as stated in the ERAI index. The share of rail transport of goods in 9405 group has also increased markedly, but the main volume of cargo is divided almost equally between air and maritime transport.

OSRAM is in the S&P bronze pool, but has the lowest environmental risks compared to its competitors, this means that the company is hardly prepared to transform with fewer incentives to do so, despite the low impact of its operations on the environment. Thus, the potential for a modal shift driven by the environmental factor seems to be high, but with certain limitations due to the peculiarities of the company's ESG model.

Company	OSRAM Licht AG (Germany/Austria), AMS (austriamicrosystems)
Product line	Optical semiconductors and lighting equipment
Country of origin	EU (Germany)
Chinese market share in revenue	20%
S&P Global ESG Risk Rating	Bronze
Sustainalytics ESG Risk Ratings (for environmental factors)	13.4 (5.3)
ESG transformation	ISO 14001 has been introduced, no emission reduction goals, indirect emissions are not accounted
Commodity group	8539, 9405
Exports of commodities from the country of origin to China (million euro)	283
Share of rail transport in exports of selected commodities to China	≈2.9%
Modal shift potential	High

Daimler

A notable example is Daimler corporation, which is one of the largest manufacturers of premium cars in the world and the largest manufacturer of commercial vehicles (Mercedes, AMG, Maybach and others). The global transport and logistics network of the company connects 75 manufacturing facilities in 30 countries and some 8,500 retailers in almost all countries of the world. Thus, in 2020, the company transported 2.7 mn vehicles in its transport and logistic chains. This is predominantly made by sea (about 350,000 TEU in 2020) and by air (about 120,000 t of cargo).

The corporation has implemented the SDGs and also has set a goal of becoming carbon neutral by 2039 through changes in production, launch of new product lines, and encouragement of partners to reduce emissions. As part of the experiment, the company also monitors and counts emissions from cars sold. The company also records emissions from vehicle deliveries to sales centres in emission statistics.

In order to reduce CO_2 emissions, Daimler optimises logistics by linking transport hubs to reduce distances and increase throughput. The company uses innovative solutions and new modes of transport, focusing not only on improving the cost and quality parameters of transport but also on reducing CO_2 emissions. As part of this policy, the company is steadily increasing rail traffic. Since February 2018, most deliveries have been made to Italy and Spain by trains instead of trucks under RailLink2Med. The transition was gradual and covered the busiest routes in the supply chain. To date, rail transport has replaced 25,000 vehicles on routes to Italy and around 40,000 vehicles on routes to Spain.

In one of the transportation segments, Mercedes-Benz has succeeded in achieving complete climate neutrality in cooperation with DB Cargo - from the beginning of 2020, production materials for Mercedes-Benz plants in Germany and in Kecskemet, Hungary, will be transported by trains running on green energy, which will allow the transportation of goods in amounts transported by 270 trucks per day. The green energy is supplied for these rail services exclusively from local renewable energy sources, mainly HPP.

Like all other members of the automotive industry in the overview, Daimler produces various products, but key products are passenger cars (8703). In this category, rail already represents a significant share of around 16% of shipments, second only to maritime transport. In addition, 8704 group (freight vehicles) is important to Daimler. The share of rail transport in this segment is negligible, although it grows according to the results of 2020.

The company is not indexed by S&P but has a risk profile comparable to BMW. However, in its pursuit of decarbonisation, it has bet on rail transport, which makes a modal shift in other regions where the company is present, including China, accounting for 1/6 of the company's revenue, urgent. With the insufficient transfer to the rail transport of some categories of goods, the prospects for further modal shift can be ranked as high.

Company	Daimler (Germany)
Product line	Premium and commercial cars
Country of origin	EU (Germany)
Chinese market share in revenue	16%
S&P Global ESG Risk Rating	N/A
Sustainalytics ESG Risk Ratings (for environmental factors)	22.1 (7.8)
ESG transformation	SDGs have been implemented, emissions monitored, emission reduction targets set, modal shift in the EU performed
Commodity group	8703, 8704
Exports of commodities from the country of origin to China (million euro)	19115
Share of rail transport in exports of selected commodities to China	≈15.8%
Modal shift potential	High

Stellantis

Among the car manufacturers, Stellantis, formed after the merger of PSA Group (Peugeot, Citroën, Opel) with the Italian-American manufacturer FCA (Fiat Chrysler Automobiles) in 2021, is also worth mentioning. It has become the fourth car maker in the world. In 2019, PSA earned almost 8% of revenue in the Chinese market. For FCA, the figure was significantly lower. Prior to the merger, one of the two key owners of PSA group, and one of the owners of Stellantis is the Chinese state-owned Dongfeng corporation, one of the four major car makers in China having its production base in Mainland China - Hubei (Wuhan, Shiyan).

PSA Group is assigned a “bronze” rating by S&P. ESG risk profile is not publicly available. Although Stellantis is at the consolidation stage, with the decarbonisation in the automotive industry and significant presence in China it would be reasonable to transfer to the rail freight, the significance of which can be assessed as average, given the current consolidation priorities and performance of similar companies.

Company	Stellantis (Netherlands)
Product line	Vehicles in different segments
Country of origin	EU
Chinese market share in revenue	8% (Peugeot)
S&P Global ESG Risk Rating	Bronze (PSA)
Sustainalytics ESG Risk Ratings (for environmental factors)	No
ESG transformation	Companies at the stage of consolidation following the merger
Commodity group	87
Exports of commodities from the country of origin to China (million euro)	30235
Share of rail transport in exports of selected commodities to China	≈13%
Modal shift potential	Average

BMW

One of the world's largest car manufacturers, BMW has a chain of plants worldwide. Key production facilities are located in Germany, while in China the company cooperates with local manufacturer Brilliance Auto Group, which produces the models of the company together with its own ones in Liaoning (Renault, also dealing with the Chinese company, has a similar location) In the wake of tampering with emission meters on vehicles, the company seeks to reduce its environmental footprint.

BMW pays attention to greening its supply chains. Every day around 7,000 containers with 31 million BMW components are shipped by sea. In cooperation with European maritime carriers, the company transfers ships to biofuels to reduce both CO2 and sulphur oxide emissions, and has already launched pilot project AUTOSKY. The company has also become part of the industry's Getting to Zero Coalition initiative to decarbonise maritime transport.

In addition to cars (8703), BMW supplies motorbike parts (8714) and car parts (8708), which forms a slightly different product mix and composition of modalities. While maritime transport is the main mode of transport of cars in general, and rail is the second-largest of all modes, in 8714 group rail has only just begun to increase its share. There is a significant share of air freight transport. In the car parts category, the value of rail freight exceeded that of the air freight for the first time in 2020.

Faced with significant public and regulatory pressure, the company undertakes significant ESG-transformation efforts and is in S&P gold cluster. However, the company is exposed to an average ESG risk. The company is already making efforts to transform the logistics chain in close cooperation with maritime carriers. And the environmental benefits of rail logistics are essential for meeting reduction targets. However, the successes achieved and focus on maritime transport may reduce the attractiveness of the rail alternative.

Company	BMW AG (Germany)
Product line	Cars, vehicle equipment, engines
Country of origin	EU (Germany)
Chinese market share in revenue	18.50%
S&P Global ESG Risk Rating	Gold
Sustainalytics ESG Risk Ratings (for environmental factors)	23.4 (6.7)
ESG transformation	Emphasis on the environment, but close cooperation with maritime carriers
Commodity group	8714, 8708, 8703
Exports of commodities from the country of origin to China (million euro)	28798
Share of rail transport in exports of selected commodities to China	≈13.6%
Modal shift potential	Average

Volkswagen

Another automotive company that pays increased attention to the decarbonisation is Volkswagen, which has many subsidiaries, including Audi, Lamborghini, Bentley, Bugatti, Skoda, Porsche, etc. According to data as of March 2021, Volkswagen is the world's second largest car manufacturer after Toyota. From the country perspective, China is the main market for the Group, with a share of 19.3% in the PRC. Also, there are 33 plants of the company in China both in coastal provinces and in the mainland.

Despite the recent tampering with emission meters on the group's cars, special emphasis is placed by Volkswagen on the environmental friendliness. The company monitors and reduces emissions throughout the spares supply chain, including through supplier rating. Also, the group is already following a modal shift policy, transferring «to the rail», primarily in Europe, for example in Spain. In Germany, Volkswagen has entered into agreement with Deutsche Bahn (DB) to switch to the rail transport within the country, following Audi, the pioneer of the transition to rail freight. As a modal shift leader in the automotive industry the group aims to transfer up to 60% of its vehicle deliveries to the rail transport by 2022.

In addition to the automotive industry, the company holds strong positions in the market of internal combustion engines (8407) and fluid pumps for cars (8413). Traditionally, there is a significant share of rail freight transport of 8407 group commodities to the PRC on a par with air freight, second only to maritime transport. In terms of 8413 group, the value of rail freight transport has substantially increased, unlike air and maritime transport, but it continues to rank third.

The company is not indexed in S&P ratings, but has a ESG risk profile slightly higher than that of its main competitors. At the same time, the company is one of the leaders in modal shift in Europe and counts on rail freight, which makes modal shift urgent in other regions where the company is present as well. Although China is not the company's main sales centre, the presence of plants in China should be taken into account when assessing the group's interest in the modal shift.

Company	Volkswagen (Germany)
Product line	Vehicles in different segments
Country of origin	EU (Germany, Czech Republic, Hungary)
Chinese market share in revenue	6%
S&P Global ESG Risk Rating	N/A
Sustainalytics ESG Risk Ratings (for environmental factors)	29.6 (8.3)
ESG transformation	Emphasis on the environment, modal shift in the EU
Commodity group	8703, 8407, 8413
Exports of commodities from the country of origin to China (million euro)	20567
Share of rail transport in exports of selected commodities to China	≈15.4%
Modal shift potential	High

CONCLUSION

As a safe way to transport large volumes of goods that allows for significant reduction in the carbon footprint of supply chains, rail freight transport has shown its resilience and reliable functionality during the pandemic. The rail transport that has both economic and environmental benefits will be crucial for the recovery of international trade in a post-pandemic world.

Further effective decarbonisation of the logistics sector requires common understanding of climate issues at all levels of economic and management activities, as well as commitment to green economy by all economic agents. To achieve specific transport decarbonisation goals both consignors and carriers should take efforts.

Many consignors have already implemented ESG principles. As the analysis has shown, goals determination to reduce emissions, emissions monitoring system installation not only at the plant, but also within product lines, and often in logistics have become commonplace. In particular, with the accounting of indirect CO2 emissions companies start to refocus their freight on the most environmentally friendly modes of transport, the main one being railways.

The most promising industries for switching to Eurasian cross-border containerised rail transport based on the growing decarbonisation agenda are the automotive industry and luxury segment of the light industry and production of expensive accessories. The automotive industry is most susceptible to decarbonisation, and availability of production capacities in the PRC, as well as the growing wealth of the Chinese population and demand for cars in the country already lead car manufacturers to take initiatives to switch to rail, at least in Europe. At the same time, some companies in the industry are progressing towards the cooperation with maritime carriers, whether or not there is a rail alternative.

Due to the intense competition, manufacturers in the premium segments, such as automobiles, clothing or watches, are also very sensitive about the environmental compatibility of their production and logistics. Given the environmental advantages of the rail transport, shortest distances, convenient logistical position between direct manufacturers and consumers of services, such manufacturers naturally gravitate towards the containerised rail transport, including across Eurasia.

This review outlines the main companies for which the drive towards decarbonisation coincides with the advantages of the rail freight transport on Eurasian transit route. Given the availability of statistical data, the review also highlights individual commodity groups or their compositions to describe the current progress in the modal shift and identify its potential in view of the decarbonisation agenda.

ANNEX 1. PROSPECTIVE COMPANIES FOR MODAL SHIFT DUE TO DECARBONISATION

(1/2)

Company	**Swatch Group (Switzerland)**	**Richemont (Switzerland)**	**Moncler (Italy)**	**Adidas AG (Germany)**	**Infineon (Germany)**
Product line	Wristwatch and wristwatch accessories, including those made of precious metals	Luxury articles: watches (31%), jewellery (42%), clothing (13%), accessories	Premium clothing	Sportswear	
Country of origin	Switzerland	Switzerland	EU (Italy, Romania, Hungary, Bulgaria)	EU	EU (Germany, Austria, Hungary)
Chinese market share in revenue	35%	26%	18%	17%	37%
S&P Global ESG Risk Rating	N/A	N/A	Gold	Bronze	Bronze
Sustainalytics ESG Risk Ratings (for environmental factors)	16.9 (0.7)	11.5 (0)	10.4	13.3 (2.2)	17.5 (7.9)
ESG transformation	Indirect emissions are not reported	The principles of environmentally friendly distribution of goods, especially packaging, have been introduced	Attention to the environment, focus on sustainable logistics, choice preference of green modes of transport and monitoring	SDGs have been implemented, production emissions are monitored	Accounts indirect greenhouse gas emissions, including from internal and external logistics
Commodity group	9101, 9102	4202, 4203	62	64, 95	8541, 8542
Exports of commodities from the country of origin to China (million euro)	2177	52	1213	1008	9370
Share of rail transport in exports of selected commodities to China	≈0%	≈0%	≈0.2%	≈2%	≈0.02%
Modal shift potential	Low	Average	High	Average	High

(2/2)

Company	**OSRAM Licht AG (Germany/ Austria), AMS** (austriamicrosystems)	**Daimler (Germany)**	**Stellantis (Netherlands)**	**BMW AG (Germany)**	**Volkswagen (Germany)**
Product line	Optical semiconductors and lighting equipment	Premium and commercial cars	Vehicles in different segments	Cars, vehicle equipment, engines	Vehicles in different segments
Country of origin	EU (Germany)	EU (Germany)	EU	EU (Germany)	EU (Germany, Czech Republic, Hungary)
Chinese market share in revenue	20%	16%	8% (Peugeot)	18.50%	6%
S&P Global ESG Risk Rating	Bronze	N/A	Bronze (PSA)	Gold	N/A
Sustainalytics ESG Risk Ratings (for environmental factors)	13.4 (5.3)	22.1 (7.8)	No	23.4 (6.7)	29.6 (8.3)
ESG transformation	ISO 14001 has been introduced, no emission reduction goals, indirect emissions are not accounted	SDGs have been implemented, emissions monitored, emission reduction targets set, modal shift in the EU performed	Companies at the stage of consolidation following the merger	Emphasis on the environment, but close cooperation with maritime carriers	Emphasis on the environment, modal shift in the EU
Commodity group	8539, 9405	8703, 8704	87	8714, 8708, 8703	8703, 8407, 8413
Exports of commodities from the country of origin to China (million euro)	283	19115	30235	28798	20567
Share of rail transport in exports of selected commodities to China	≈2.9%	≈15.8%	≈13%	≈13.6%	≈15.4%
Modal shift potential	High	High	Average	Average	High

Source: authors' calculations based on company financial and non-financial reports, UN Comtrade, The Sustainability Yearbook 2021, Company ESG Risk Ratings, Reuters and public domains.