Alternative Transport Mode: China-EU Trade on Rail

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Prepared by: Yingzhi Zhang, Sr Regional Operations/SME Specialist, Maritime & Trade

In 2020, China for the first time was seen as the EUs largest trade partner (when looking at Total Trade Value). Disruptions in supply chains appear to have destabilized bilateral trade within some of the EUs usual top trade partners, and trade with China came out to be the least impacted. The table below shows how the year-on-year percent change hit the top ten partners more severely than China.

Table 1: EU external trade with top partners, 2020 vs 2019

Trade Partner	2019		2020	
	USD	Mtons	USD	Mtons
World	-2%	-1%	-10%	-8%
China	1%	10%	-6%	-8%
United States	4%	3%	-23%	-15%
United Kingdom				
Switzerland	5%	1%	-12%	-5%
Russia	-6%	-4%	-28%	-12%
Turkey	-5%	10%	-11%	-7%
Japan	0%	6%	-21%	-24%
Korea, South	-6%	-15%	-8%	-18%
Norway	-10%	-2%	-27%	-31%
India	-5%	9%	-27%	-34%

Source: IHS Markit Global Trade Atlas

Particularly, while absolute trade growth is moderate and COVID-19 hit maritime trade, rail routes from China to the EU reported significant growth both in terms of trade value and volume. Actually, this growing trend of rail trade between the two economies has lasted for years (since Express Rail services between China and Europe were gradually introduced), with over 10,000 journeys made on rail between the two continents in 2020.

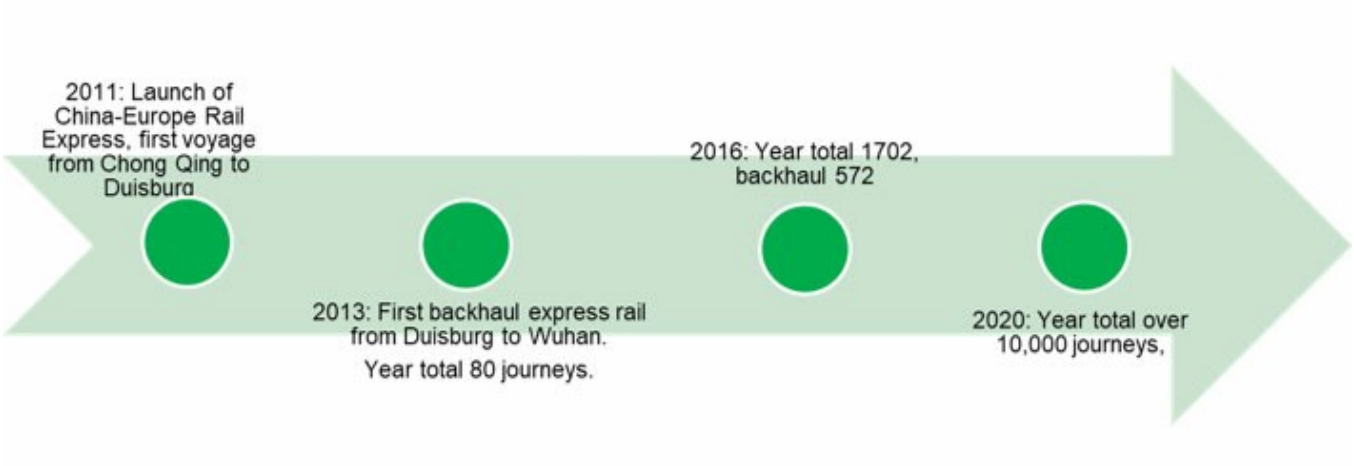
While maritime is still the dominant mode and a more mature transport means, rail is an emerging alternative for some market segments and supports trade development to those landlocked areas. Yet the potential is still yet to be realized and will rely on the level of standardization, infrastructure, freight pricing, and overall logistics matureness.

Trade statistics provide an opportunity for answering questions such as:

- How can landlocked China regions and EU states en route benefit?
- How can railway, along with other modes, offer more options and multimodal transport solutions?
- Which sectors/products are more likely to select rail mode as an alternative transport mode considering how fast-to-market strategy and high-value or time-sensitive goods trades are facilitated with more efficient logistics?

- What might be the potential industry to lead balancing trade supporting backhaul loading shipment?

Figure 1: Timeline of China-Europe Rail Express



Summary and implications

Trade between the EU and China on rail has been speeding up in recent years, since the introduction of express rail services. Rail remains a small portion compared with maritime but has been growing quickly both in terms of value and volume, and in both directions. Rail trade share in the bilateral trade has increased from <1% to about 4%. Trade in EU states en route and China railway hub regions, especially those landlocked areas, have been largely stimulated. Imports into the EU from China are still the main driver, yet backhaul trade has started to gain momentum in recent years and will be important to make rail more sustainable.

The commodities that opt for rail are also widely diverse, ranging from industrial products such as mechanical, electronics, and vehicles to apparel, households, and food. Unit price could be a differentiator as higher-value goods tend to favor railway as an alternative transport mode or be part of the multimodal services relaying long-haul sea journey and road/air traffic. But railway trade could also be driven further by those time-sensitive or fast-to-market consumer products.

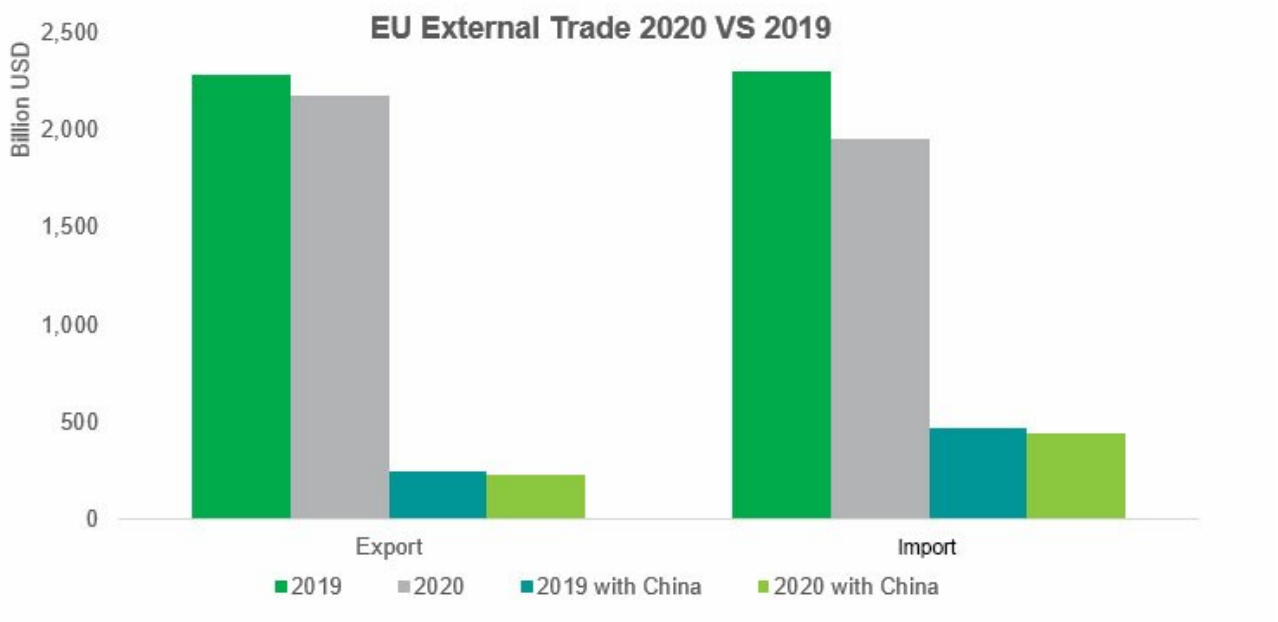
- **Logistics Service Providers** (forwarders, transport, warehouse, etc.) use trade data to track trade by transport mode and location/corridor to shape the transit route options, offer multimodal transport services, and look for potential cargo catchment locations and addressable markets/shippers/regions.
- **Equipment Suppliers** such as rolling stock or container handling facilities suppliers would be able to find the demand market size and where to sell their products or design new equipment according to different cargo transport requirements.
- **Infrastructure Planning/Investment/Research** need to carry out comprehensive feasibility studies based on real data to evaluate the sustainability business mode and market for transport mega infrastructure projects planning and investment. Trade statistics would be one of the important datasets to take into consideration when evaluating potential specific routes.
- **Local Government/Agencies**, especially those regions en route or within wider multimodal transport networks, may find opportunities to attract investment and addressable sectors that rail mode may become commercially viable; for example those time-sensitive or high-value products (fresh food, electronics, vehicles, or luxury/fast fashion).
- **Industry Organizations** setting standards may from trade and traffic data examine the market to find any gaps or prioritize areas of work, e.g. cross-border measures and documentation formalities, to accommodate the evolving transport modes.

Trade with China in 2020

During COVID-19, EU external trade experienced a drop both in terms of imports and exports. China for the first time

became the largest trade partner of the EU, particularly in terms of westbound trade, i.e. EU imports from China. According to reported data by the EU, imports from China totaled $443 billion USD, representing 23% of total imports. Although absolute trade value slightly contracted with a drop of ~6%, this was much lower in comparison with its 15% decline of total imports from around the world.

Figure 2: EU total external trade and trade with China



Source: IHS Markit Global Trade Atlas

Figure 3: Import trade partner share in 2020

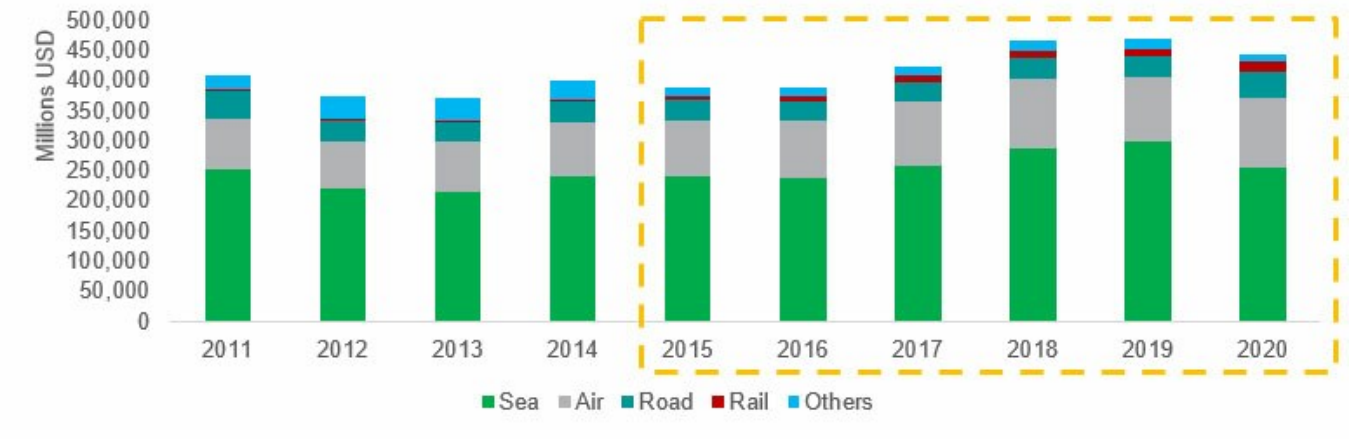
Source: IHS Markit Global Trade Atlas

Rail import trade from China

In general, the total trade volume has been on a steady upward trend from 2016 until 2020 when the pandemic certainly

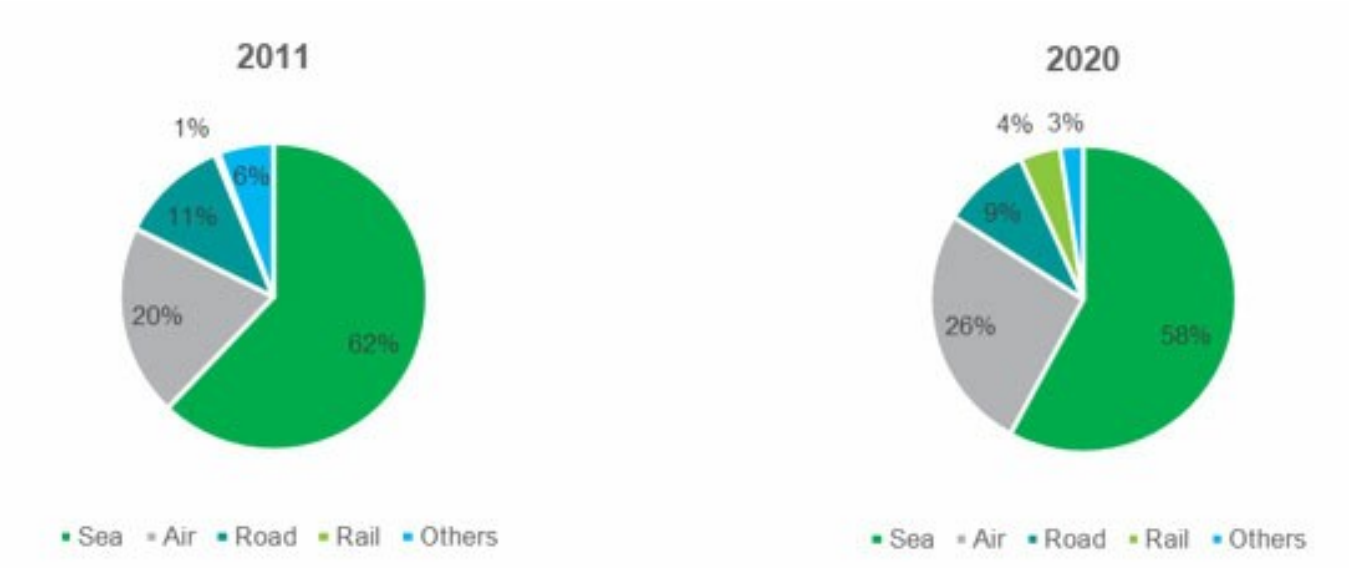
inserted an unexpected negative effect. However, when looking at import value by transport mode, it is observed that rail transport growth – although it is still a very insignificant percentage in terms of absolute value – is significant with the share in total imports increasing from <1% in 2011 to 4% in 2020. Even in 2020 when maritime trade contracted, import by rail increased.

Figure 4: EU import trade value from China by transport mode, 2011-2020



Source: IHS Markit Global Trade Atlas

Figure 5: Share change (2020 vs 2011) of different transport modes



Source: IHS Markit Global Trade Atlas

From Figure 6 below, we may also observe that since the launch of the express rail service, rail trade toward EU countries has grown quickly even in years when other transport modes have stalled. In the first few years, the freight subsidies provided some stimulus effect, but as the market has become more mature and stable, the routes that sustained still recorded growth.

Figure 6: Import from China annual growth rate by transport mode

Source: IHS Markit Global Trade Atlas

The trade volume and value by rail from China to the EU are growing in tandem in recent years, as shown in the figure below. During the period 2016-2020, i.e., since the launch of Express Rail service, trade volume has more than doubled with CAGR at 26.9%, reaching 1,580 thousand tonnes in 2020. That could be equivalent to over 70,000 TEU if assuming 20T per rail container.

Figure 7: Import by rail value and volume (2011-2020)

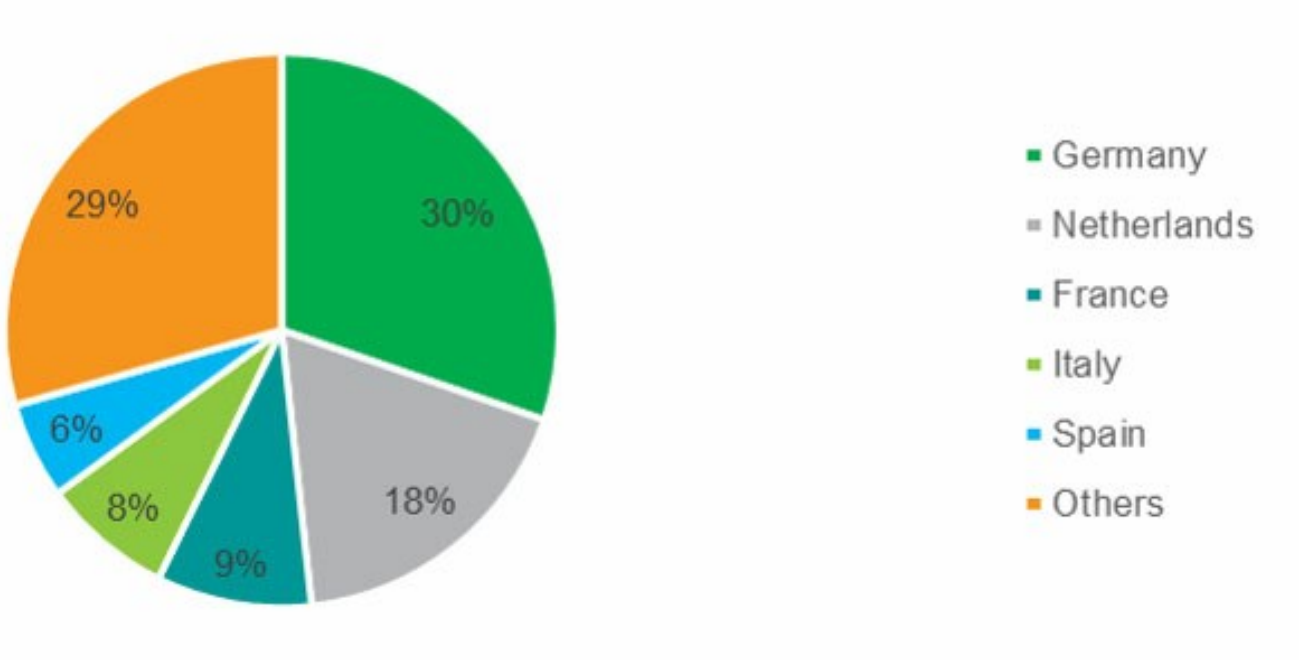
Source: IHS Markit Global Trade Atlas

Regional impact from rail trade

Counting all transport modes, large EU economies remain on top in terms of import trade with China. As Figure 8 shows, Germany and Netherlands account for 30% and 18%, respectively, followed by France, Italy, and Spain.

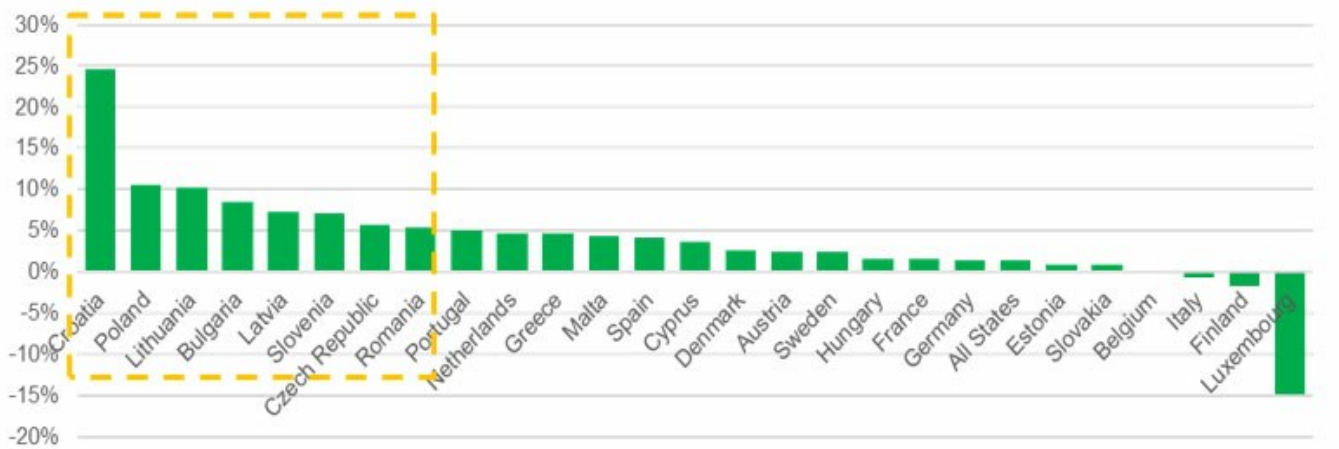
Yet if looking at the growth (Figure 9), there are emerging EU countries, including Poland, Croatia, Lithuania, and those Baltic countries, that have recorded strong annual growth consecutively in the past decade. It looks as though these countries are not traditional 'sea trading' nations and even without large seaports (or landlocked countries such as Austria, the Czech Republic, Hungary, and Slovakia), growth in imports from China is consistent over the years.

Figure 8: All transport mode import from China share



Source: IHS Markit Global Trade Atlas

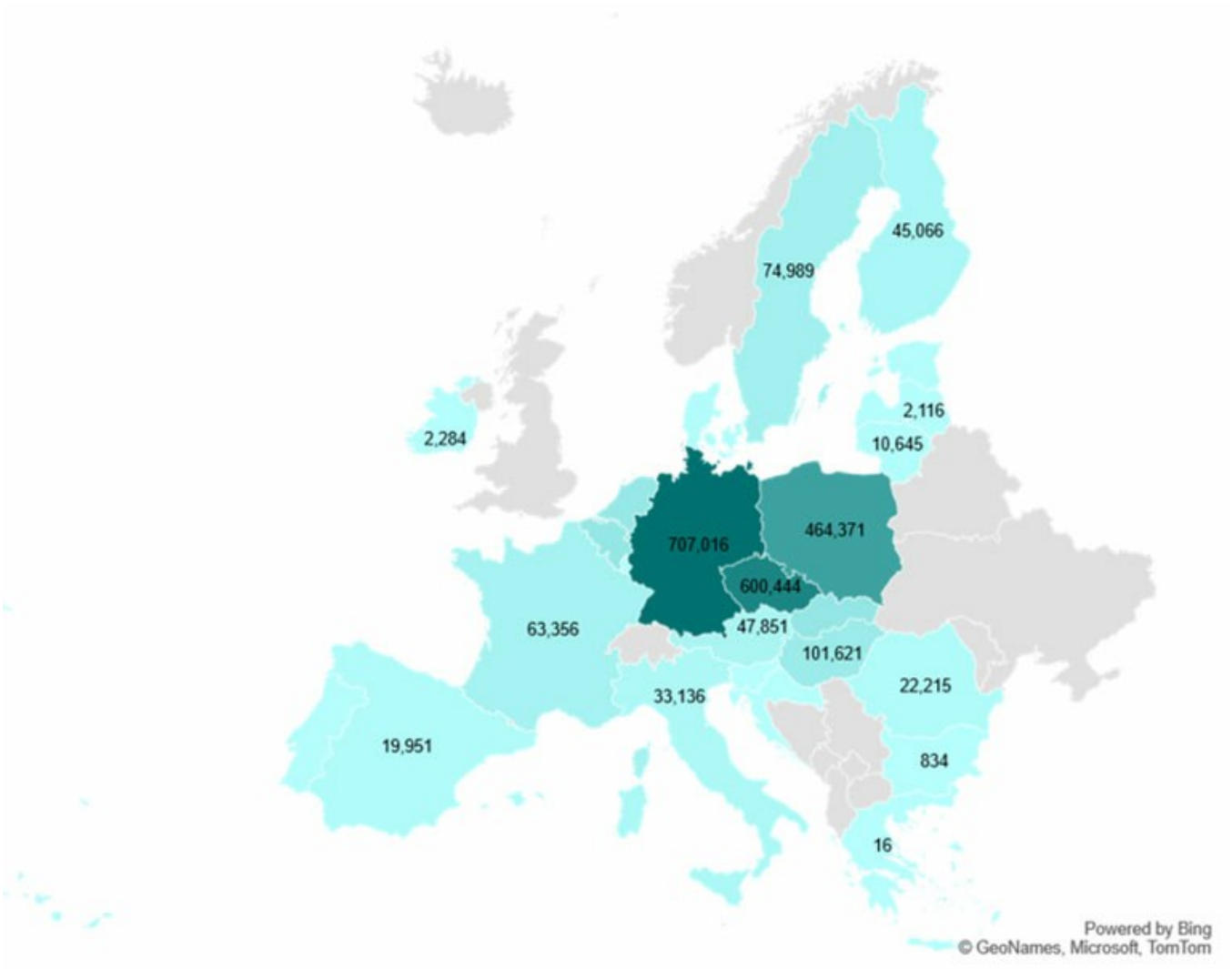
Figure 9: CAGR by member states in past decade



Source: IHS Markit Global Trade Atlas

Focusing on rail mode import by looking at import volume by each EU member state, as the map below shows, Germany, Poland, and Austria are the top states that receive shipments by rail. Their adjacent smaller states are also importing notable volume if compared with their total trade scale. Rail is possibly contributing much to the overall trade of these countries.

Figure 10: Import volume (tonnes) by rail from China (2020)



Source: IHS Markit Global Trade Atlas

On the other side, rail transport also stimulates trade for those inland provinces in China. It is surprising to see that in 2020, when overall trade was not in the best shape, these provinces with less sea connectivity were at the higher end of export growth spectrum. In general, there are five to six cities considered the express rail hub sending block trains, including Chengdu, Chongqing, Yiwu, Suzhou, Zhengzhou, Wuhan, and Shenyang. Rail services are advancing trade in their local areas and the adjacent provinces as well.

Figure 11: Major rail services and annual trade growth in 2020 by province

Source: IHS Markit Global Trade Atlas; China Railway website

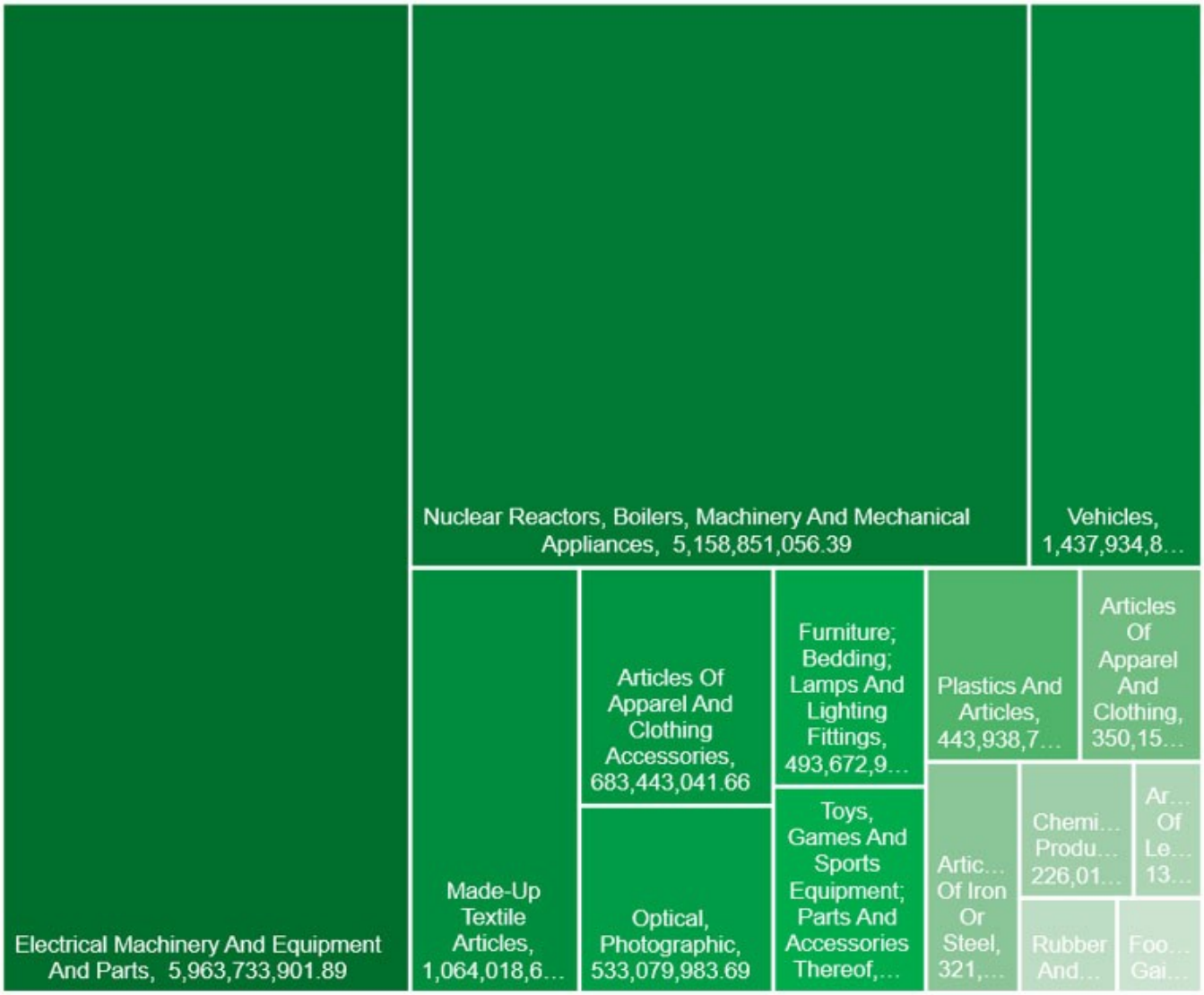
This was not surprising if collectively looking at the express rail service routes as pointed out in Figure 11. The destinations in the EU include Duisburg and Hamburg as the two largest hubs, then radiate to adjacent areas. For China, not only the provinces and countries where railway terminals are located, but also the adjacent areas, have seen positive growth. This could imply wider cargo catchment markets and local logistics network connectivity.

Sectorial preference

What types of goods prefer rail as an alternative mode would be a question asked by logistics providers if they would like to enter the market and look for potential clients and cargo market catchment. The advantage of using rail is the speed and a competitive price compared with air freight. It would typically take two weeks and, compared with ocean freight, it may interconnect with a road leg more seamlessly to provide a real 'door-to-door' service.

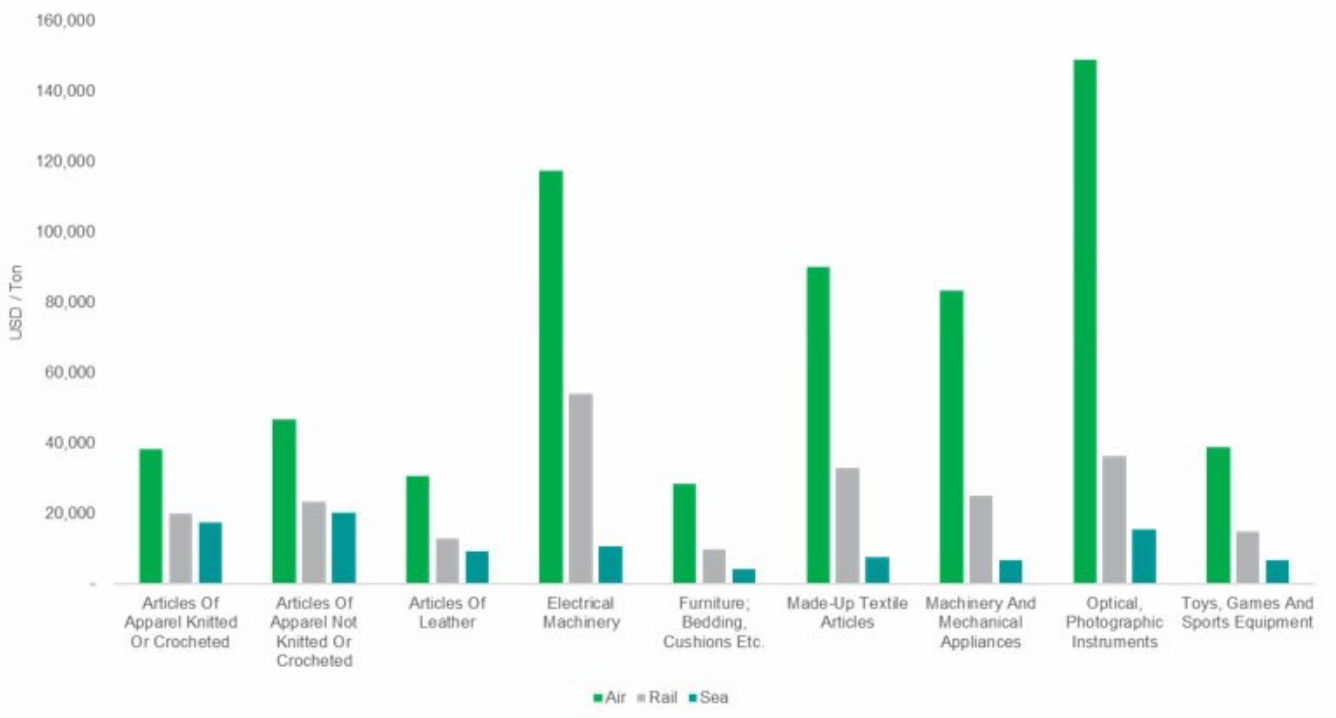
In 2020, some of the top listed commodities imported by railway from China include electric equipment ($5.96 billion), nuclear reactors and boilers, machinery ($5.16 billion), and vehicles ($1.44 billion); however, it is also interesting to see that textile and apparel cargo (i.e. HS 61 - 63) are also forming a large portion of rail carriage. Unit price of the shipments may give some implication when examining whether any transport mode is a good option for shippers. As may be expected, across all the top commodities, rail trade unit pricing is in between air and sea freight. The price gap seems most significant when it comes to consumer products such as made-up textile articles and toys/game/sports equipment.

Figure 12: Top commodities import by rail (2-digit HS Code level)



Source: IHS Markit Global Trade Atlas

Figure 13: Unit price comparison of top commodities import by rail

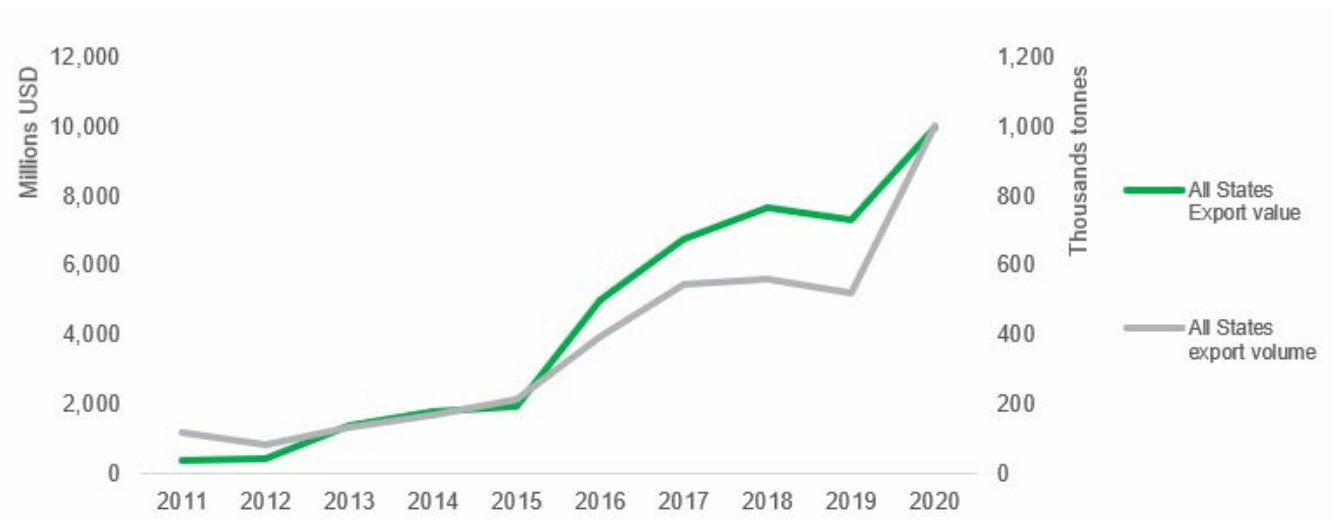


Source: IHS Markit Global Trade Atlas

The backhaul journey

Since the launch of express rail, one of the questions frequently being asked is whether the backhaul trains (i.e., Europe to China) could be fully loaded considering the existing trade imbalance. This is also important for the rail freight and any infrastructure investment to be economic and sustainable over the years, thus worth looking at trade data when examining the market status and any segment potentials. From Figure 14, it seems in the initial years, backhaul trade started from nearly nothing and slowly ramped up; yet since 2016, the growth became steadier and in 2020, trade volume and value reached ~1 million tonnes and ~10 billion USD.

Figure 14: EU to China trade by rail (2011-2020)



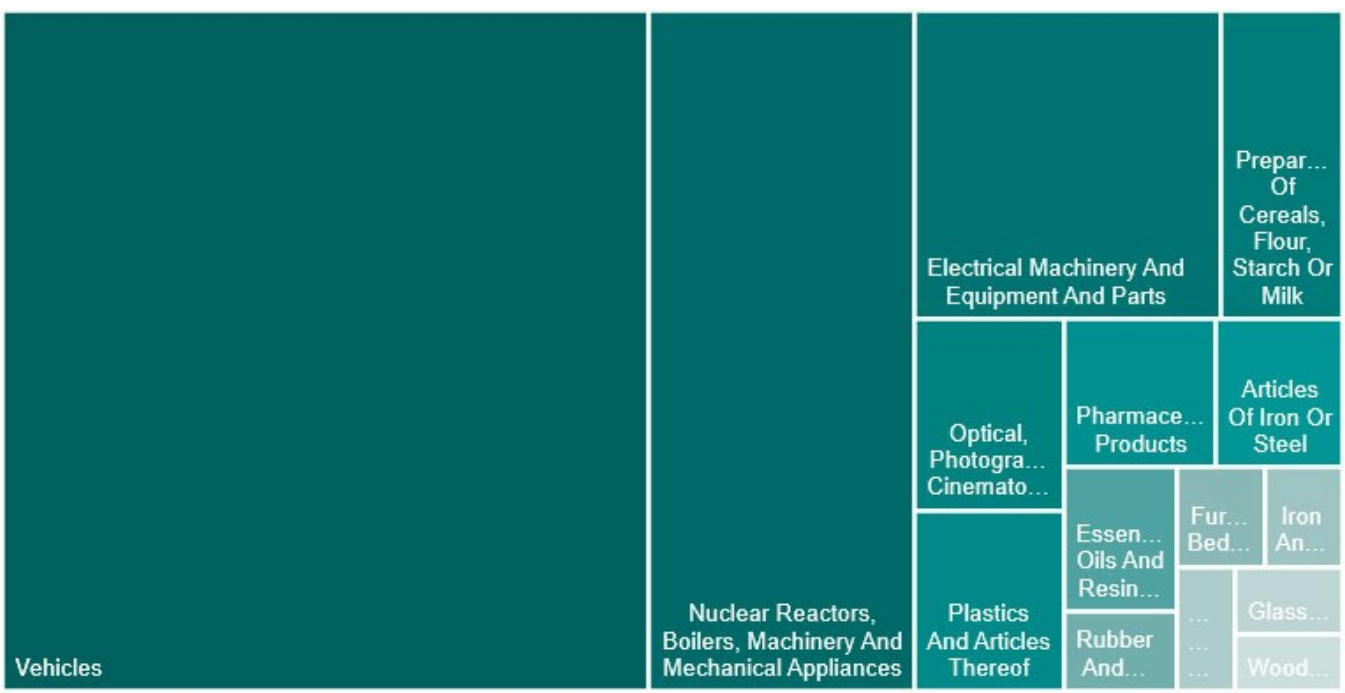
Source: IHS Markit Global Trade Atlas

Figure 15: Annual growth by mode

Source: IHS Markit Global Trade Atlas

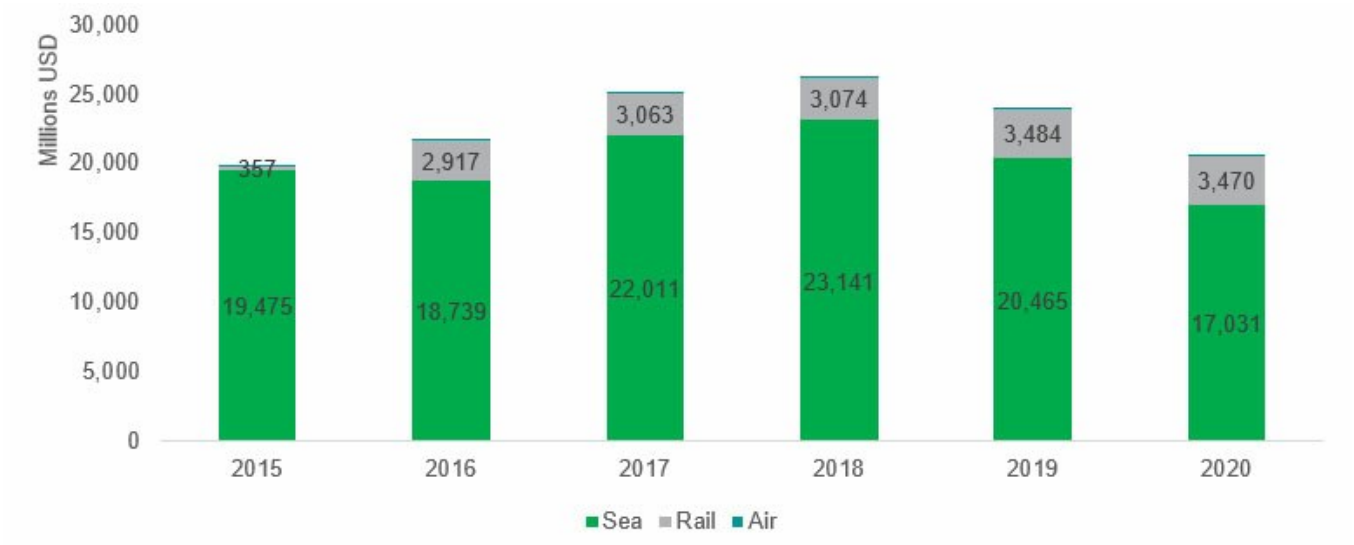
In terms of the type of cargo delivered from the EU to China, industrial products – particularly vehicles (HS 87) – became a large contributor, with products worth 4.5 billion USD delivered to China on rail, of which the passenger vehicle dominates over other sub items under the same HS chapter. Take this top category as an example; railway has kept expanding in recent years, with passenger cars worth 3.47 billion USD exported to China in 2020. Among the top export commodities, we also noticed that food (such as milk products) and cosmetics, which could to some extent owe to the consumer market or e-commerce, demand a faster delivery service.

Figure 16: Top commodities export to China by rail



Source: IHS Markit Global Trade Atlas

Figure 17: Vehicle export to China by transport mode



Source: IHS Markit Global Trade Atlas