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Switzerland's dependency on maritime transportation

Contribution of high-sea shipping on Swiss import and
export supply chains

White Paper

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*“Practice-based,
science-driven”*

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**SWISS
SHIPOWNERS
ASSOCIATION**

Report prepared on behalf of
Swiss Shipowners Association

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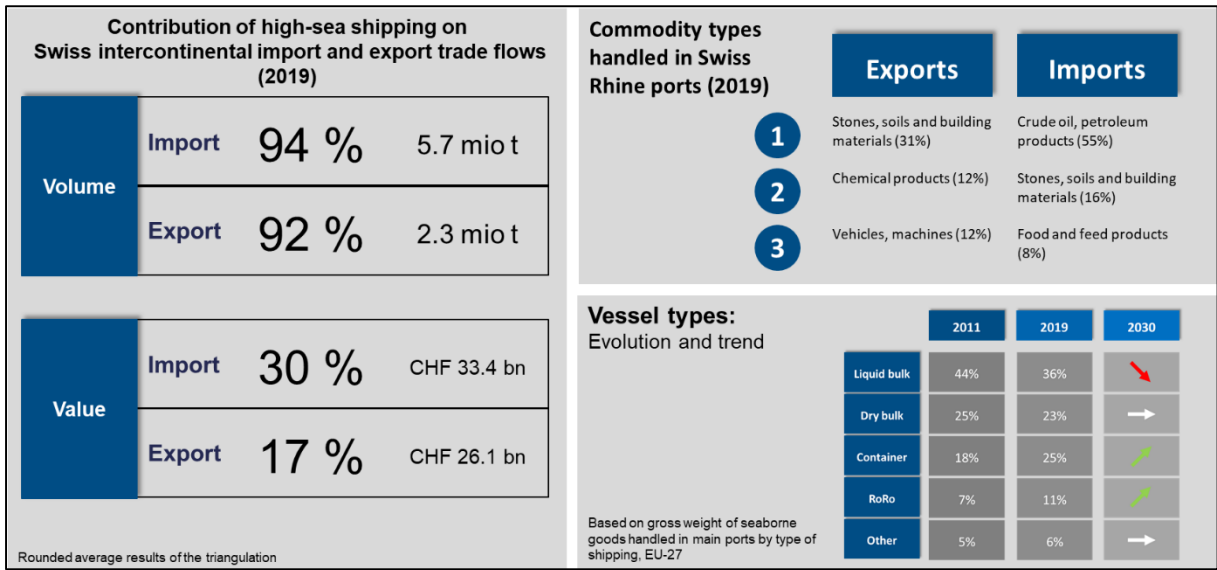
Management Summary

Motivation. For the globally connected Swiss economy, reliable and efficient freight transport flows are crucial for keeping the country's global supply chains running. As 90% of world trade is carried by ships, maritime transportation is considered as the backbone of international trade and the global economy. Although being a landlocked country located in Central Europe, Switzerland is ranked 4th in Europe and 10th in the world in terms of gross tonnage of the merchant fleet operated by companies based in Switzerland. The relevance of high-sea shipping and the dependence of the Swiss economy on this mode of transport are both largely unknown and not reflected in official statistics.

Study objective. The primary study objective is to highlight the importance of high-sea shipping for the trade flows of the Swiss Confederation. Therefore, quantities and values of Switzerland's maritime trade flows will be estimated differentiated by commodity groups and vessel types including trends in the maritime sector relevant for the Swiss Confederation. In this context, the analysis focuses particularly on Switzerland's intercontinental foreign trade flows.

Methodology. The analysis follows the research strategy of triangulation in which different kinds of data are used to investigate the study phenomenon in order to use the strengths of one approach to compensate for the weaknesses of the other. The aim of the methodology is to achieve higher validity of research findings and reduce systematic errors. Quantitative results were primarily estimated based on foreign trade statistics by the Swiss Federal Customs Administration, due to the limited data basis for Switzerland supplemented with official statistics by ports, authorities as well as related study material analysing the maritime sector. Validation was supported by experts reviewing methodological approaches and results.

Key findings



Volumes and values. Regarding Switzerland's intercontinental foreign trade, 94% of imports and 92% of exports by volume were carried by high-sea vessels in 2019. By value, these shares account for 30%

of imports (CHF 33.4 billion) and 17% (CHF 26.1 billion) of exports. The nominal volume of 8 million tonnes combining export and import flows, equals 10% of total foreign trade volume.

High-sea shipping dependency is not to be reduced to intercontinental trade flows only. Due to upstream and downstream transport stages that are a directly part of a supply chain configuration, substantial proportions of continental foreign trade depend on high-sea shipping as well. Trading partners reflected in the official foreign trade statistics are often not the actual origin or destination of trade flows. For this reason, the analysis excludes European trade flows, which means that no robust statement is made about the total share of Swiss foreign trade depending on high-sea shipping. However, the analysis indicates that a multiple of the nominally estimated 8 million tonnes respectively 10% of Swiss foreign trade volumes depend on high-sea shipping, if not only considering intercontinental trade. At a conservative estimate using a factor of two, this amounts to at least 14 million tonnes.

Commodities. Among commodity groups depending on high-sea shipping, bulk goods account for the largest share. This is mainly due to the high efficiency of high-sea shipping for the transport of bulk goods. Almost the entire trade volume of petroleum and petroleum products reaches Europe and thus also Switzerland by sea before goods are transhipped in seaports and carried to Switzerland via inland waterway, pipeline, rail or road. High-sea shipping also has a high transport affinity for foodstuffs and feedstuffs, namely coffee and grains, for example. Goods handled in the Swiss ports reflect high-sea trade flows only to a limited extent as supplemented by truck and rail traffic.

Vessel types. The relevance and evolution of vessel types is directly linked to commodities transported. Accordingly, bulk carriers account for the highest share. In Europe, the share of goods handled by ship has shifted in favour of container ships, a development likely to continue. Container ships have increased their share in European seaports from 18% to 25%. While the share of liquid bulk declined from 44% to 36% between 2011 and 2019, the share of dry bulk has remained constant.

Trends. Typical bulk goods are increasingly being transported in containers. This favours the trend of containerisation in maritime shipping, the shift towards the use of containers. Main drivers not only comprise low freight rates, but practical reasons and economies of scale associated with larger units. Expected growth rates for the container volume development in the Swiss Rhine ports until 2030 reflect the relevance of this trend for Switzerland. Transport mode-specific affinities, combined with infrastructural framework conditions, indicate it is unlikely that Switzerland's intercontinental trade flow volumes will face a significant modal shift.

Vessel capacities as well as global maritime freight volumes have increased dynamically over the last decade. This evolution is likely to continue in the upcoming decade. Bottlenecks for further vessel size increase remain the port infrastructure and hinterland connection.

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1. Unknown importance of high-sea shipping for Switzerland

As 90 % of world trade is carried by ships, maritime shipping is considered as the backbone of international trade and the global economy.¹ On the one hand, being landlocked and located in central Europe, Switzerland lacks direct access to the sea. On the other hand, however, Switzerland's foreign trade ratio² is among the highest of all countries worldwide and has further increased over the last decade, reaching 117% in 2019.³ This figure reflects Switzerland's high extent of economic openness, higher compared to EU-28 states which have a foreign trade ratio of 90%. Accordingly, with countries such as the United States of America, China, India, Hong Kong and Japan, five of the ten most important export markets by value are located outside Europe. Reliable and efficient freight transport flows are therefore crucial for keeping the country's global supply chains running. How can Swiss companies keep up global supply chains despite the lack of access to the sea, when maritime trade is of such global importance? Of which relevance are individual modes of transport in this context?

As the route between Europe and the Americas, Oceania and large parts of Asia cannot be crossed by truck or train – air and sea freight are in many cases the only possible modes of transport in international trade. Especially intercontinental trade flows rely on high-sea shipping as a means of transport. As the volumes transported by air freight are very low, the question arises as to the significance of maritime transportation in securing Switzerland's export and import supply chains.

A recent study published by IG Air Cargo Switzerland has highlighted the importance of the air freight logistics industry for the Swiss economy. The study states that air freight opens up global trade markets for Switzerland and is particularly relevant for high-value and time-critical goods. As sea and air freight are the major modes of transport for intercontinental trade, they take a systemically relevant role for Switzerland's economic development and make a decisive contribution to securing prosperity and jobs in Switzerland. Accordingly, 50% of all exports by value (CHF 157 billion) left Switzerland by air freight in 2019, even higher when only considering intercontinental trade. However, the volume share of air freight is limited, below 1% of total exports and imports which indicates the dependency of intercontinental trade on maritime shipping.

Study objective

At present, the economic significance of maritime transportation for the Swiss economy is not well understood. Neither public nor policymakers are aware of the extent to which Switzerland's trade flows depend on high-sea shipping. This study addresses the existing gap and aims at shedding light on the subject. The primary study objective is to highlight the importance of high-sea shipping for the trade flows of the Swiss Confederation. Therefore, quantities and values of Switzerland's maritime trade flows will be estimated differentiated by commodity groups and vessel types.

¹ UNCTAD (2020). Review of Maritime Transport 2020; International Chamber of Shipping (2020). Shipping and World Trade: Predicted Increases in World Seaborne Trade, GDP and Population

² defined as sum of imports and exports as percentage of country GDP

³ Swiss Federal Customs Administration (2020). Foreign trade statistics.

Structure of the White Paper

The White Paper is structured as follows. Chapter one provides a starting point, outlining the circumstances of the Swiss shipping industry and the economic profile of the country. Subsequent paragraphs comprise the geographical conditions of freight flows and points out the need to analyse the role of the Swiss shipping industry and the country's dependence on it in detail. This also indicates the challenges with regard to the data basis as maritime shipping is not adequately represented in official Swiss trade statistics. Chapter two focuses on international trade flows identifying inbound and outbound supply chains and Switzerland's major trading partners and characterising the transport mode of high sea shipping. Chapter three presents the methodologic approach, results and interpretations of the analysis conducted in this study. Chapter four examines the development of high sea shipping in a global context in order to provide an outlook and trends relevant to the Swiss Confederation.

Switzerland's geographical conditions regarding high-sea shipping

Due to geographical aspects, air and sea freight are the only viable modes of transportation on some trade routes in international trade. Intercontinental trade flows, in particular rely on high-sea shipping as a means of transport. Switzerland is one of the only few European countries being landlocked, having no maritime coasts. The only access from Switzerland to any seaport via ship is along the river Rhine connecting the Swiss Rhine ports in the region of Basel to some of the major European ports: Rotterdam, Antwerp and Amsterdam named as ARA-range.⁴ At the same time, the inland waterway connection to the ARA-range is of strategic importance for Swiss trade flows. In 2019, 10% of imports and 5% of exports by volume were transhipped via the Swiss Rhine ports⁵ giving the Basel region an important gateway function. In order to enable the flow of goods between Switzerland and seaports, goods are either transported across the Swiss border by road, rail or inland waterways – both in upstream and downstream transport stages. Due to its location, Switzerland also has an important function as transit country for North South freight traffic often carried by rail. This circumstance is supported by infrastructural measures such as the New Railway Link through the Alps (NEAT) for both more and faster north-south rail links across the Swiss Alps and a reduction in truck traffic across the Alps.

Especially in intercontinental trade, Swiss export and import supply chains need to be operated as multimodal transport processes accordingly, combining several modes of transport in order to secure the end to end transport of goods to its final destination. Swiss exports and imports usually transit through North Sea, secondarily through Mediterranean ports. Especially when trading bulk goods with countries outside Europe, ocean-going vessels in the shape of bulk carriers are used almost without exception.

⁴ The ports of Antwerp, Rotterdam and Amsterdam are referred to as the ARA-range

⁵ Swiss Rhine Ports (2020). Rheinhafenverkehr nach Gütergruppen 2019; Swiss Federal Customs Administration (2020). Foreign trade statistics.

Switzerland as a shipping nation – ranked 10th worldwide and 4th in Europe

Even though Switzerland lacks direct seaport access, the Swiss shipping industry is not to be underestimated. A total of more than 900 ships are operated by companies based in Switzerland. Among them are important global players in the sector such as MSC Mediterranean Shipping Company, a company registered in Geneva since 1978. With a fleet of more than 550 ships is the second largest container shipping company in the world behind the leader Maersk from Denmark. Not only does the maritime sector contribute 0.4% respectively CHF 2.4 billion to the Swiss Confederation's GDP and directly employ more than 2,000 people.⁶ According to recent statistics from Danish Shipping referring to IHS Seaweb, Switzerland is ranked 4th in Europe and 10th in the world in terms of gross tonnage of the merchant fleet operated by companies based in Switzerland.⁷ The global merchant fleet consists of more than 98,300 vessels, corresponding to a total gross tonnage of 1.42 billion, of which Switzerland's 56 million represent a share of 4%.

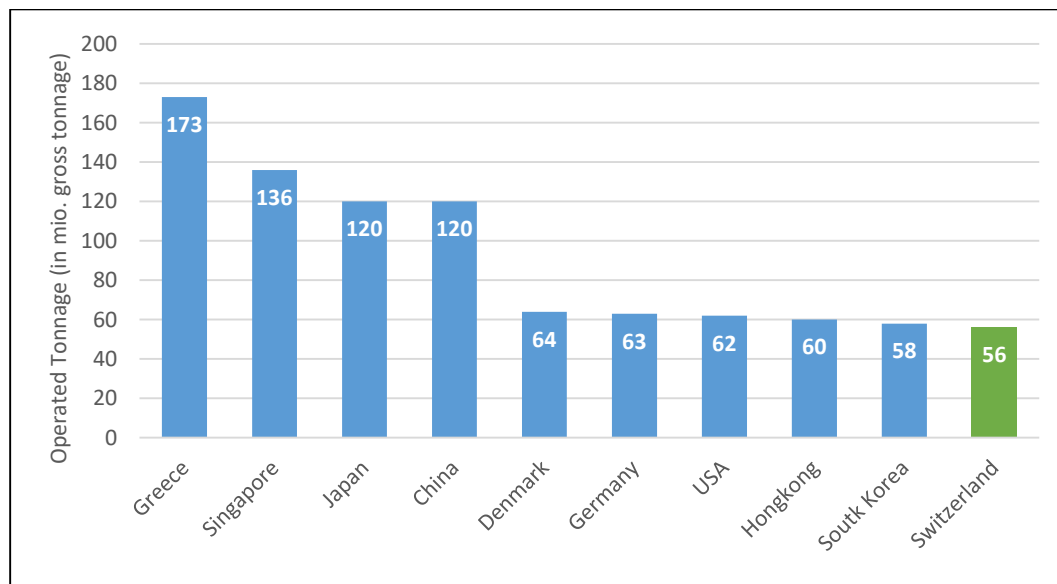


Figure 1: Global merchant fleet by operator nation - top 10 by July 2020.⁷

In recent years the Swiss shipping industry has experienced a profound crisis, especially in Switzerland. The disappearance of certain ship owners or operators has led to a significant decline in the Swiss-flagged fleet. While in 2016, the Swiss fleet comprised 50 cargo ships from six ship owners this number reduced to slightly more than 20 ships sailing under the Swiss flag.⁸ Having ships under the Swiss flag generates tax revenues for the Swiss state, and at the same time also strengthens the country's voice at the United Nations International Maritime Organization to advocate its own interests.

Official statistics do not reflect the relevance of maritime shipping for Switzerland

As the capacity of high-sea vessels exceeds by far size and weight restrictions of the river Rhine, high-sea vessels cannot reach ports in Switzerland. Official customs statistics regarding volume and value

⁶ Swiss Trading & Shipping Association (2021). Switzerland, a maritime nation.

⁷ Danish Shipping based on IHS Seaweb (2020). Ultraflash - Stability in the Danish Operated Merchant Fleet 2020 (data by July 1st, 2020).

⁸ UNCTAD (2020). Review of maritime transport 2020.

of exports and imports reflect the means of transport used when crossing the border into or out of Switzerland. High-sea shipping is not listed as mode of transport. Intermodal supply chain operations are not adequately reflected in customs data. The issue becomes obvious when looking at an example: Imports from MERCOSUR countries were 325,475 tonnes in 2019, of which rail accounts for 61,127 tonnes (18.8%), truck for 88,887 tonnes (27.3%), air for 1,505 (0.5%) and inland waterways for 173,885 (53.4%). The share of rail and truck can only represent the route between European seaport and import destination in Switzerland. The main run between South America and Europe has most likely been carried by high-sea vessel as the air freight share of 0.5% is neglectable. This assumption is backed by European port data⁹ according to which 70% out of total 3.5 billion tonnes gross weight of freight handled in main European ports¹⁰ were transported to or from ports outside the EU. Already prior to the analysis, it is clear that the importance of high-sea shipping is not reflected in official statistics. Addressing this challenge, this study aims at quantifying value and volume flows that are transported on high-sea vessels.

Economic profile of the Swiss economy

In 2019, goods with a total value of CHF 312 billion were exported from Switzerland.³ The value share of imports amounted to CHF 276 billion. Figure 2 shows the evolution of Switzerland’s foreign trade between 2000 and 2019. Whereas the trade volumes have evolved almost constantly, trade value has increased dynamically.

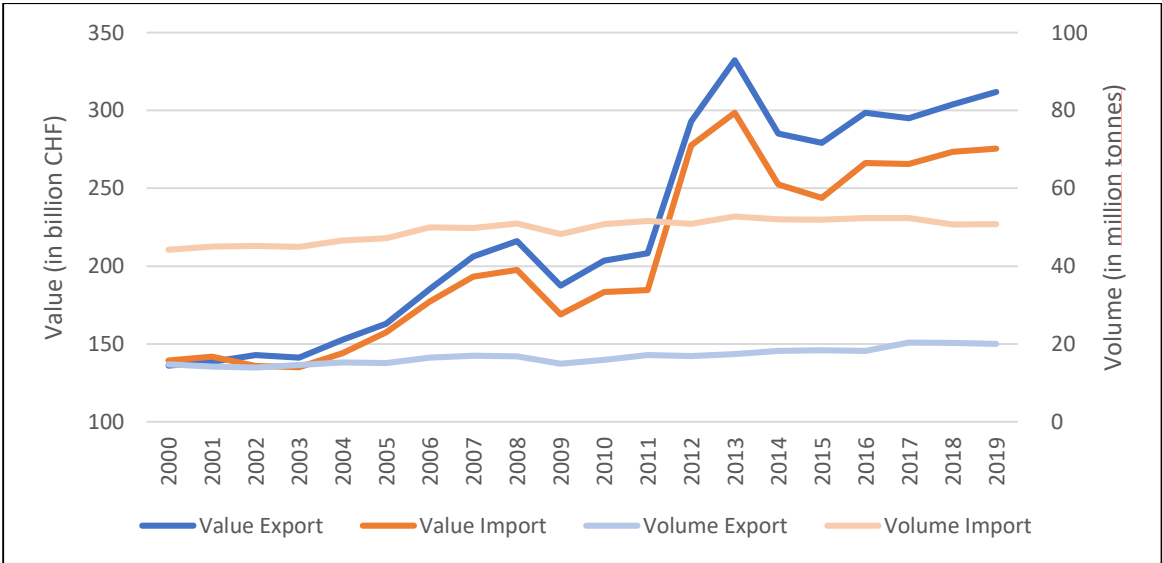


Figure 2: Development of Swiss imports and exports between 2000 and 2019 by value and volume.³

Commodities: Out of the total Swiss exports worth in 2019, chemical-pharmaceutical products (37%) are the most important commodity, followed by metals and derivatives incl. precious metals (mainly gold) (22%) and machinery and electronics (10%). Imports are dominated by metals and derivatives

⁹ Eurostat (2020). Maritime ports freight and passenger statistics.

¹⁰ Main port defined as handling >1mio tonnes annually

incl. precious metals (25%), followed by chemical-pharmaceutical products (19%) as second most important commodity and machinery and electronics (12%) ranked 3rd.

Table 1. European and intercontinental shares in Swiss foreign trade in the year 2019.³

	Volume (in mio. t)		Value (in bn. CHF)	
	Import	Export	Import	Export
Total trade	50.82	20.03	276.06	311.98
European	44.75	17.53	164.65	156.91
European in %	88.1%	87.5%	59.6%	50.3%
Intercontinental ¹¹	6.07	2.51	111.40	155.06
Intercontinental in %	11.9%	12.5%	40.4%	49.7%

Table 1 Fehler! Verweisquelle konnte nicht gefunden werden. splits the Swiss total foreign trade dichotomously in European and intercontinental trade. It shows that by volume European countries account by far for the highest share of trading partners. By volume, intercontinental trading partners represent 11.9% of imports and 12.5% of exports. However, the picture evolves differently for the value share as the intercontinental share increases to 40.4% of imports and 49.7% of exports. Intercontinental trading partners are therefore of crucial importance for the development of the Swiss economy.

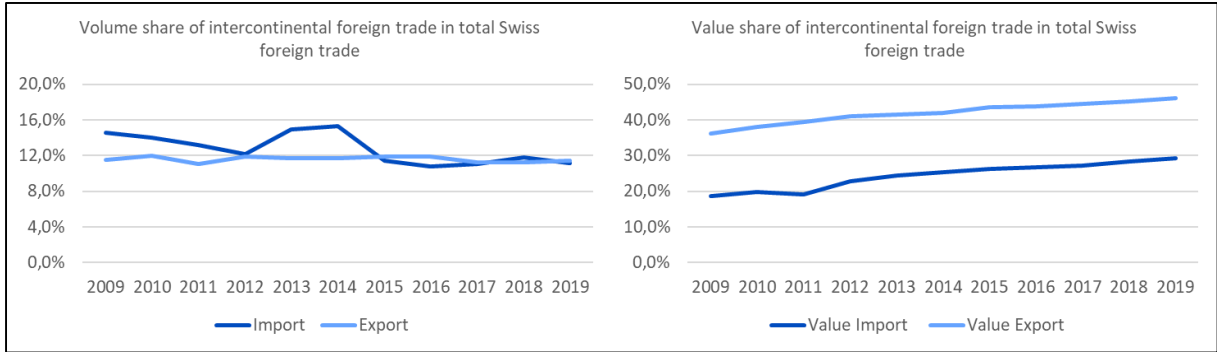


Figure 3. Evolution of volume and value share of Swiss intercontinental foreign trade.

A view on the evolution of Switzerland’s intercontinental foreign trade reveals a decoupling of value and volume flows (see Figure 3). On one hand, the value share of intercontinental trade as percentage of total foreign trade has steadily increased over the last decade indicating an increasing relevance of trading partners outside Europe. On the other hand, volume shares have remained stable for exports and decreased for imports. Between 2009 and 2019, intercontinental imports decreased by 2%, intercontinental exports rose by 3%. This evolution is in line with total trade development showing that total imports marginally increased by 5% since 2009, total exports, however, increased by 35%.³

¹¹ Note: Russia and Turkey are excluded from "European" and only assigned to "Intercontinental", as the majority of the territory of both countries is outside Europe.

2. International trade flows from a Swiss perspective

Swiss customs data illustrate an accurate picture of transport modes used at border crossing. However, when considering the entire supply chain, a variety of modes of transports might be used to transport goods. Imports from North and South America that are recorded as rail or truck must have first reached Europe on the sea route, if not carried by air freight. Due to the methodological approach of the statistics, high-sea shipping is never recorded as foreign trade statistics capture the mode of transport at border crossing. On the basis of official data published, it is therefore not possible to estimate the importance of international high-sea shipping for the Swiss economy.

Table 2 shows Switzerland's most important intercontinental trading partners. When comparing them in terms of value and volume, significant differences become apparent, as well as between imports and exports.³ Major export trading partners are mostly highly developed countries reflecting a strong demand for high quality Swiss products from these countries. On the import side, the picture blurs as the higher relevance of developing countries emphasises Switzerland's supply situation. High import volumes of developing countries demonstrate the big inbound share of raw materials (eg. crude oil from Nigeria), food and feedstuff (grains and cereals from Brazil) which are important for the national supply.

Table 2. Switzerland's top intercontinental trading partners in import and export, by volume and value.³

Rank	Volume (in t)		Value (in billion CHF)	
	Import	Export	Import	Export
1	Nigeria (935,530)	USA (663,334)	China (14,893)	USA (41,989)
2	China (872,771)	China (294,819)	USA (13,737)	China (13,392)
3	Kazakhstan (790,064)	UAE (158,264)	UAE (14,893)	Japan (8,080)
4	Libya (610,072)	Canada (113,081)	Japan (7,728)	Hong Kong (5,524)
5	USA (572,004)	Japan (98,320)	Vietnam (2,848)	Singapore (4,962)
6	Brazil (185,129)	India (85,292)	Singapore (2,168)	Canada (3,953)
7	India (169,683)	Singapore (663,334)	India (1,960)	South Korea (3,432)
8	Japan (134,426)	Brazil (61,325)	Hong Kong (1,296)	UAE (2,830)
9	Algeria (89,436)	Libya (52,832)	Taiwan (1,252)	Australia (2,568)
10	Canada (73,881)	Thailand (49,179)	Thailand (1,045)	Brazil (2,512)

The importance of maritime shipping only becomes clear when analysing the supply chains of certain goods end to end. The following are relevant Swiss supply chain examples that illustrate the complexity of global trade flows.

Exemplary inbound and outbound supply chains

Switzerland is one of the largest coffee nations in the world, both as a trading hub for coffee as well as for the processing of coffee beans. Around Lake Geneva, the largest coffee traders worldwide have their corporate headquarters. Almost 190,000 tonnes were imported to Switzerland in 2019, almost exclusively from intercontinental origin. The largest importing countries comprise Brazil, Colombia and Vietnam. For the main (intercontinental) transport, only high-sea vessels are of relevance for this type

of commodity. Figure 4 illustrates schematically the inbound trade flow to Switzerland. After arriving in a European port, for example Hamburg, containers are transhipped and imported by train or truck.

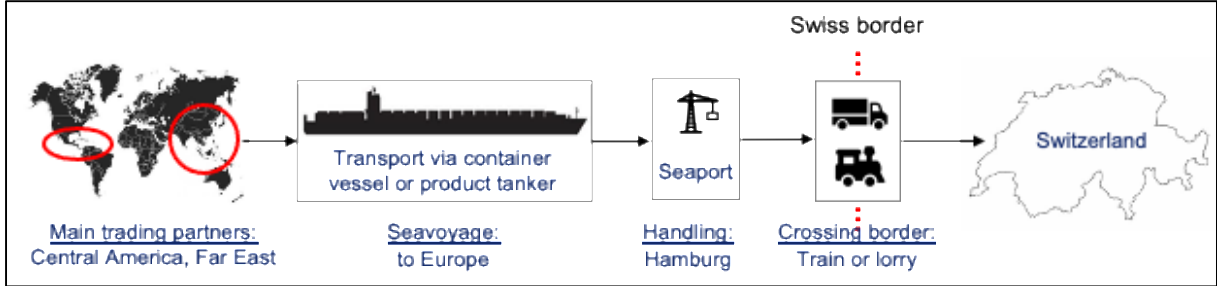


Figure 4: Exemplary inbound supply chain representation - coffee and coffee beans.

The discrepancy between Swiss customs statistics and actual trade lanes becomes even more apparent when looking at the import supply chain of refined petroleum products, e.g. fuels for vehicles or aircraft as well as for the industry (see figure 5) which amounted to 7.8 million tonnes in 2019. According to foreign trade statistics, Germany, the Netherlands and Belgium are named as the main trading partners, although these countries do not have significant oil resources. In reality, products are for example imported from the Netherlands after being refined in a Dutch refinery. The actual origin of the petroleum is located in other countries, however. Relevant trading countries are in the Middle East, Africa and Russia. In every case, the crude oil is transported by tanker to a European seaport. Crude oil is then refined and afterwards imported to Switzerland. For finished processed petroleum products, the Rhine ships, which deliver their cargo directly from the large refineries to the Rhine in Basel, are the number one means of transport. Pipeline transports also cover a significant proportion, connecting the Mediterranean ports of Genoa and Marseille with Swiss refineries such as in Cressier.

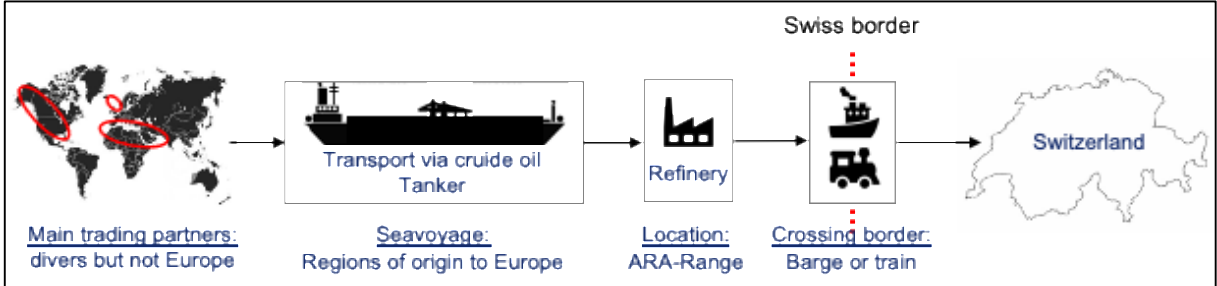


Figure 5: Exemplary inbound supply chain representation - refined petroleum.

When considering the outgoing flows of goods, maritime shipping cannot be ignored. In 2019, Switzerland exported almost 450,000 tonnes of industrial machinery (see Figure 6). Trading partners worldwide value, the high-quality of Swiss industrial machinery and equipment. Accordingly, just under 35 % of those goods (by value), were exported to countries outside Europe. Due to the dimensions of the cargos, high-sea shipping is often the only viable way to transport the machinery internationally. Also, in this case, the associated transports upstream and downstream can vary, but in almost every case the high-sea vessel cannot be replaced.

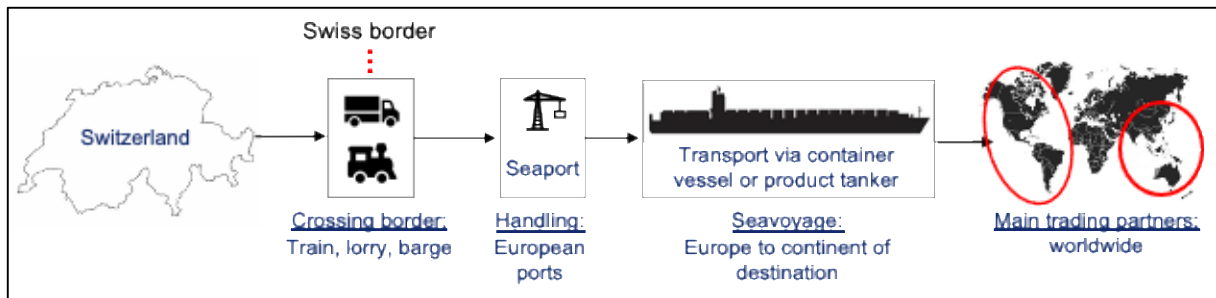


Figure 6: Exemplary outbound supply chain representation - industrial machinery.

High-sea shipping convinces with loading capacity

With few exceptions, only aircraft and seagoing vessels can be used as a mode of transport for intercontinental trade. However, specific advantages of both modes differ widely. While air cargo shows a strong transport affinity for time-sensitive, high-value goods, the advantages of sea freight include low transport costs and high performance for volume goods. Even if air freight-affine goods, for example high-value electronics, are occasionally transported in consolidated containers, air and sea freight are not to be seen as substitutes and cannot be replaced by each other.

Asia can be reached by rail on the new Silk Road, and transports in both directions of sea freight can apparently be substituted. In 2018, 345,000 standard containers were transported on the new Silk Road between Europe and China.¹² At the same time,

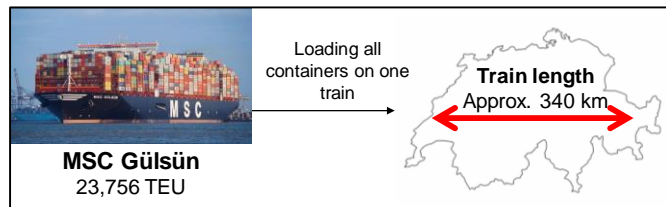


Figure 7. Shifting a container vessel on a single train.

almost 46 million containers were handled in the European North Sea ports. Although 640,000 containers are expected to be transported on the Silk Road by 2027, this share will only represent 1.5 % of the total container trade between Europe and Asia.¹² If all the containers from a huge container vessel (MSC Gülsün: 23,756 TEU) were lined up on a single train, the length of the train would reach more than 340 km (see Figure 7).¹³ This example illustrates the performance of high-sea vessels for the transport of large volumes. Capacity on the new Silk Road will not be able to replace maritime freight in the foreseeable future. Thus, maritime transport will remain the backbone of European-Asian trade.

3. Estimation of the relevance of high-sea shipping for Switzerland

The data analysis phase of existing sources targeted at the study goal aims at providing comprehensive, resilient results for an objective assessment of the influence and dependency of the Swiss economy on high-sea shipping.

¹² Roland Berger (2018). Eurasian rail corridors

¹³ European Commission (2020). European seaports 2030: upcoming challenges; MSC (2021) MSC Gülsün fact sheet.

3.1 Methodologic approach

In order to reach the study objective, the analysis stage followed the methodological approach of triangulation. Triangulation¹⁴ is as a research strategy in which (1) different kinds of data are used to investigate a phenomenon in order to (2) use commonly the strengths of several approaches. The aim of the methodology is to achieve higher validity of research findings and reduce systematic errors.

Review criteria and quality standards of sources

For the purpose of triangulating key findings, the compilation of a "longlist" of sources provided the foundation for the initial review and evaluation of existing studies. The analysis focused on the use of publicly available sources only. Furthermore, the analysis targeted the study objective only for which a full analysis of all studies was not intended. In order to structure the review process, a catalogue of criteria was defined prior the literature review (see figure Figure 8).







 Publisher / author / client	 Methodology
 Topicality / year of publication	 Influencing factors / premises
 Time period under consideration	 Limitations

Figure 8. Overview of criteria used to evaluate existing sources in the analysis.

Additionally, in order to take into account that the validity of the selected sources varies, quality standards were defined to help focusing on highly valid and credible sources only. Definitions of the three derived quality standards A, B and C are illustrated in Figure 9. The analysis in this study comprises quality standards A and B only.

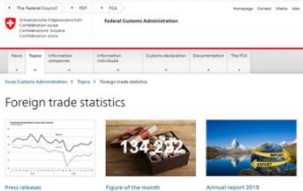


<p>Quality standard A</p> <p>Official data published by authorities and federal offices</p> <ul style="list-style-type: none"> ➤ Unrestricted compliance with central quality criteria validity, objectivity <p>EZV/FCA: Foreign trade statistics</p> 	<p>Quality standard B</p> <p>Data and studies by reputable institutions</p> <ul style="list-style-type: none"> ➤ High level of validity and objectivity ➤ Underlying assumptions are reasonable and documented, findings are comprehensible. <p>ISCM, IG Air Cargo: Air Freight Logistics Study</p> 	<p>Quality standard C</p> <p>Data and studies published by private companies and associations</p> <ul style="list-style-type: none"> ➤ Partially data quality issues or limited transparency/traceability ➤ Objectivity and thus also validity might be questionable <p>DHL: Ocean freight market update</p> 
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Figure 9. Segmentation of data sources according to quality standards.

¹⁴ Blaikie, N. (1991). A Critique of the Use of Triangulation in Social Research.

From longlist to shortlist – deriving a study inventory for in-depth analysis

In a second step, a compressed study inventory was derived. The so called “shortlist” was further evaluated and used for the estimation of quantities and values of Switzerland’s maritime trade flows. In total, of all sources scanned, 31 were reviewed, of which 16 were allocated to the shortlist. The remaining 15 sources were put on the longlist. Those were excluded from the analysis within the triangulation as they only offer restricted added value for the study objective. Sources on the longlist were afterwards partly used to compare and contrast key findings and to highlight global market trends and developments not primarily linked to the Swiss market.

All 19 studies on the shortlist were then reviewed in detail following a two-step approach illustrated in Figure 10. Firstly, key features of each source were documented. This step comprised documenting authorship, publisher, method, content as well as limitations of the source. Secondly, it was documented how and which data and findings of each source were used. Besides reporting quality standard, method, the targeted parameters and results of the source, the following characteristics were documented if findings were further processed to estimate or extrapolate data: Underlying assumptions, step by step procedure of data processing as well as limitations of the approach.

Data origin						
Number	Title	Authorship	Publisher	Method	Content	Limitations
Document allocation	Source name (link to source)	Name of the authors	Name of the publisher	Methodological approach of the authors	Intended outcome and content of study	Limitations of the source
I	Air Freight Logistics Study 2020	Häberle, Stölzle (2020) - Institute of Supply Chain Management HSG	IG Air Cargo Switzerland	Mixed methods approach: quantitative and qualitative market analysis of the air freight industry focusing on the Swiss market	performance of the (Swiss) air freight logistics markets analysed in a European comparison perspective focusing on the following topics: air freight logistics market, climate, digitalisation, customer requirements, regulatory & COVID-19	sea freight analysed subordinately for comparative purposes in relation to air freight

1. Data origin

- Documentation of key features
- Characterisation of main sources

2. Data usage and processing

- Documentation of procedure and derived results

Data usage and processing							
Quality standard	Method	Target parameters	Assumptions	Procedure	Limitations	Results	Comments
consistent with classification in the or comparison study inventory	Estimate, modelling	modelling parameters in scope	Assumptions made that are necessary for determining the result	Methodological procedure for determining the results	Limitations of the determination of results	Concrete results of data usage and evaluation	comments
B	Estimate purely based on EZV data	Value and tonnage share of sea freight in Swiss intercontinental foreign trade	1. road and rail as modes of transports are neglectable for intercontinental transport as only sea and air freight are used 2. Intercontinental imports and exports that are not transported via air freight are treated as seafreight	1. Extraction of intercontinental trade traffic out of total foreign trade for both exports and imports differentiated by tonnage (ca. 11% of both exports and imports) and value (40% of imports, 50% of exports) 2. As air and sea are the only possible modes of transport, exclusion of air freight share (tonnage share very low with only 1% of imports and 5% of exports, value share varying between 68% for intercontinental imports and 82% for exports 3. Remaining share is fully attributed to the maritime sector	total modes of transport other than air freight is calculated as sea freight. However, in few markets other modes of transport are used as well (small share of trucking to Northern Africa, rail to China) -> neglectable share	Sea freight tonnage share in intercontinental... - imports: 98,9% - exports: 94,8% Sea freight value share in intercontinental... - imports: 32,1% - exports: 18,4%	

Figure 10. Two-step approach for a comprehensive and transparent documentation of reviewed sources.

Expert interviews as key element of the validation process

Derived preliminary findings were validated by conducting expert interviews and comparing findings to other markets. The selection of experts targeted at including multiple perspectives to cover and critically assess derived findings and estimations. In total 5 experts were interviewed representing the following four logistics backgrounds:

- Sea freight – global
- Rail – Switzerland and global
- Shipper association – Switzerland
- Port – Switzerland and Europe

Based on the expert interviews, the methodological approaches, the concrete procedure in the analysis and the preliminary results were critically reviewed. Figure 11 provides an overview of the entire analysis phase and shows in chronological order how the results, presented in the following chapter, are obtained.

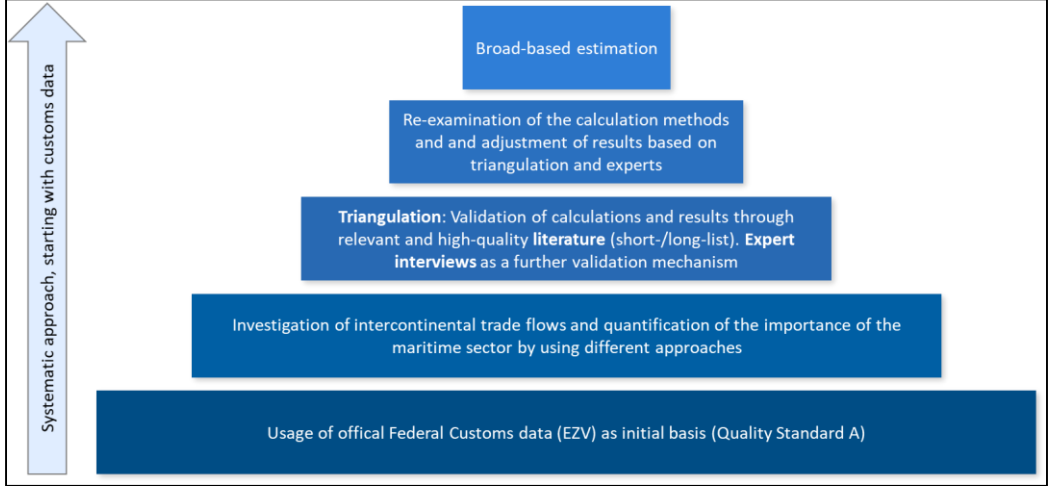


Figure 11. Methodologic approach of data analysis – phases of triangulation.

3.2 Results

Key findings from the analysis are illustrated following the subsequent order: (1) Share of high-sea shipping in intercontinental, (2) key findings on commodity groups and (3) key findings on vessel types in high-sea shipping.

1. Share of high-sea shipping in intercontinental exports and imports

Based on the three methodological approaches using Swiss Federal customs data, results are initially presented for each approach (see Figure 12 to Figure 14), followed by a consolidated view combining the approaches with additional sources and input by the conducted expert interviews.

Approach 1 is based on Swiss foreign trade statistics by mode of transport (see Figure 12). The approach follows the idea that identifying non-high-sea traffic shares and excluding them from the total intercontinental trade will provide the share of Switzerland’s intercontinental foreign carried by high-sea vessels. For this purpose, the procedure begins with extracting the intercontinental traffic share to solely analyse these trade flows. As can be seen in Table 1, the intercontinental share by volume is 11.9% in exports and 12.5% in imports, by value equal to 40.4% in imports and 49.7% in exports. It is assumed that the share not transported by air, will be fully covered by maritime shipping. There are practical examples that show that this assumption does not fully reflect actual trade flows. For example, a very limited share of trucking is supposed to be transported between Switzerland and some North African countries such as Morocco, crossing the Strait of Gibraltar in combined traffic supported by roll-on/roll-off ships. Additionally, the New Silk Road offers the possibility to connect Europe and China by train. As intercontinental truck and rail traffic is not taken into account, the selected approach provides a ceiling value for both volume and value share. In other words, the result

is overestimated to a small extent depending on the actual truck and rail share (for further analysis on this aspect see chapter 3.3). In terms of value, this results in shares of 98.9% for imports and 94.8% for exports. Given the high average value of goods in air freight (2019: CHF 1,413 per kg in Swiss exports and CHF 1,225 in imports), the values derived for high-sea shipping are far lower, ranging between 32.1% of imports and 18.4% of exports. This reveals an essential characteristic of sea freight, its particular affinity for the transport of volume goods with a comparatively lower value than commodities transported by air freight.

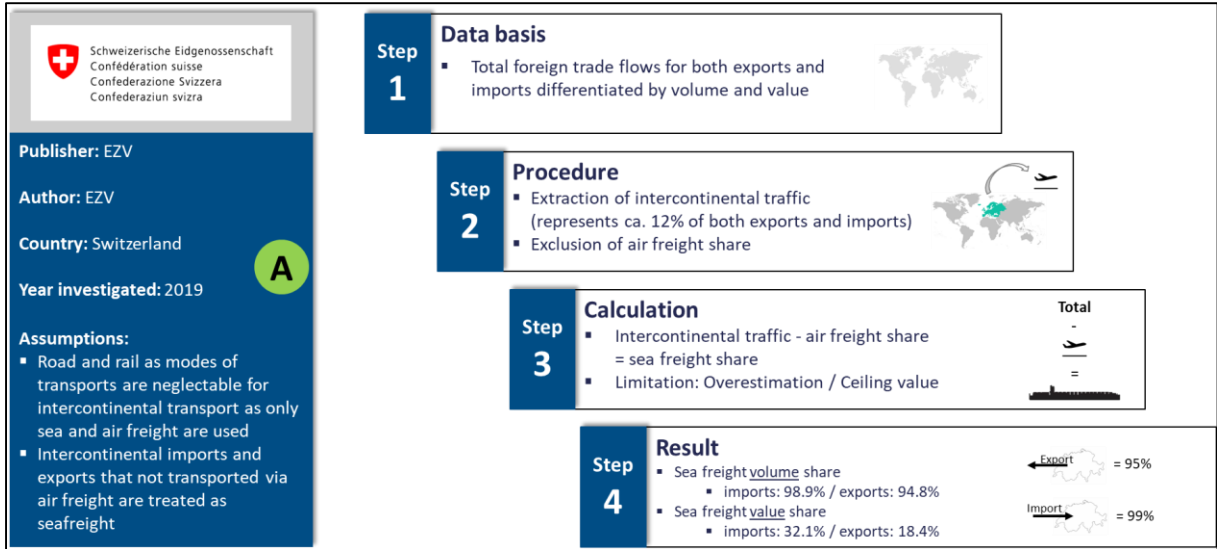


Figure 12. Methodological approach 1 – Extraction of intercontinental traffic share.

Approach 2 is similar to approach 1. Total foreign trade flows are analysed, and modes of transport captured at border crossing are re-allocated to high-sea shipping and air freight. The concrete procedure is illustrated in Figure 13. Results by volume are 87% and 89% for import and export. Results by value range beyond the ceiling value identified according to approach 1 and must therefore not be interpreted. Further interpretations and limitations are presented in chapter 3.3.

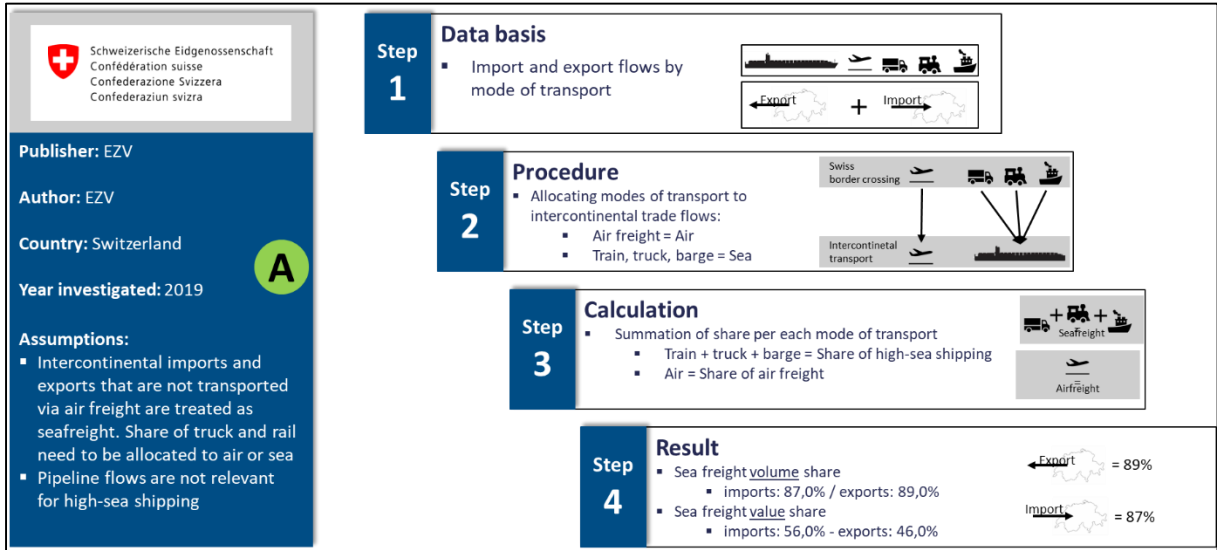


Figure 13. Methodological approach 2 – Re-allocation of transport modes.

Approach 3 is based on Swiss foreign trade statistics by commodity groups (see Figure 14). The starting point for this approach is the consideration that the value of a product has a significant influence on which mode of transport is used in intercontinental trade. Road and rail as modes of transports are again neglected for intercontinental transport. For each commodity group and subgroup,³ the proportion transported by ocean-going vessel was estimated based of the average value per kilo. For example, the average value per kilo for agricultural, forestry products and for energy sources is lowest compared to all other commodities. Accordingly, it is assumed that these are transported by high-sea vessels in 100% of cases. On the other hand, precision instruments, watches and jewellery have the highest average value of goods and are assigned to air freight exclusively. Other commodity groups were proportionally split between the two modes of transport.

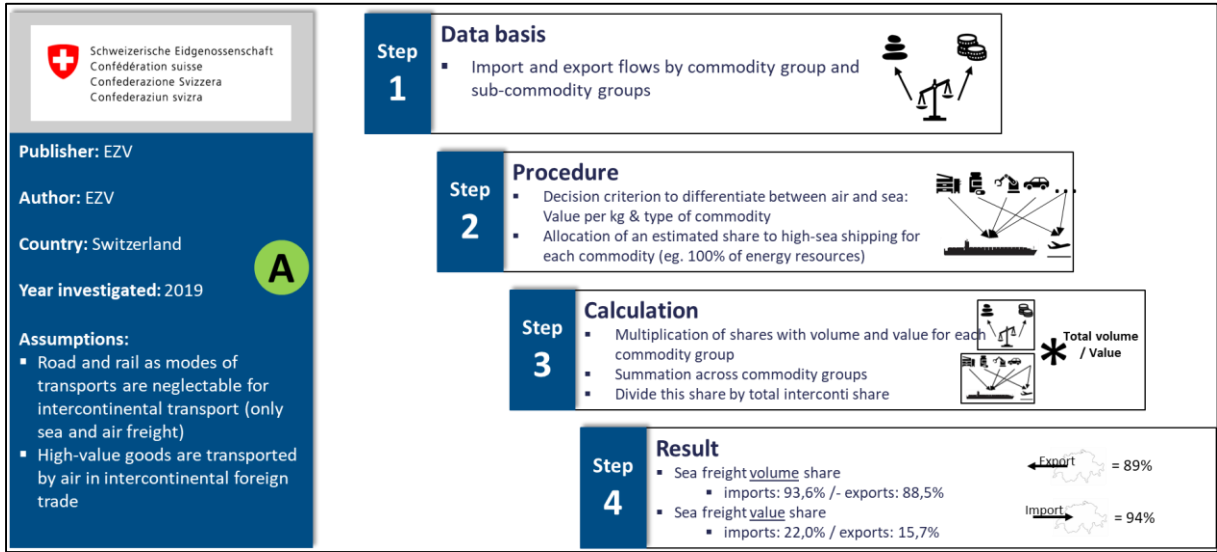


Figure 14. Methodological approach 3 - Allocation of commodity groups to modes of transport.

Consideration of rail share along the New Silk Road

Before combining results from the analysis, the current impact of freight flows transported across the New Silk Road between China and Europe are considered. Currently, trade volumes carried across this route, are low compared to volumes handled in major European ports as can be seen in Figure 15. The Silk Road is to be seen as a niche product, particularly relevant to regions with a high production share as in the German automotive industry. Car manufacturers actively use the additional transport route, in addition to air and sea freight. For Switzerland, however, it can be assumed that the volumes are even lower than in Germany.

Freight volumes	In 2018, 345,000 standard containers were handled across the New Silk Road. At the same time, 46 Mio containers were handled in the North Sea ports.
Volume outlook	In 2027, approximately 640,000 containers will be handled according to Roland Berger (2018). This share would represent 1.5 % of the total container volume on the trade lane between Europe and Asia.
Transport duration	High-sea vessels take around 30 days to travel between Shanghai and Rotterdam, while trains take just over 15 days.

Figure 15. Relevance of the New Silk Road in European Asian trade flows.¹²

Triangulation - Final results

When all approaches are brought together, values shown in **Fehler! Verweisquelle konnte nicht gefunden werden.** result for the share of high-sea shipping in Swiss intercontinental trade. 94% of all intercontinental imports and 92% of exports depend on high-sea shipping in terms of volume. By value, these shares amount to 30% (nominal CHF 33.4 billion) of imported goods and 17% (nominal CHF 26.1 billion) of exported goods. Most of the remaining commodities by value are transported by air, with only a small value share being transported overland intercontinentally. In addition to the air freight shares of about 63,000 tonnes in imports and 98,000 tonnes in exports, a further 300,000 tonnes are considered to arrive in Switzerland by rail or truck, and about 100,000 tonnes are considered to leave Switzerland by rail or truck, not including ocean freight. This leads to nominal high-sea vessel share of 5.7 million tonnes of imports and 2.3 million tonnes of exports. These shares estimated for intercontinental trade flows correspond to 11.5% of total exports and 11.2% of imports by volume, and 8.4% of total exports and 12.1% of imports by value. This puts Switzerland below the EU-27 average, but at the upper end compared to other landlocked countries. In addition, it should be noted that Switzerland's values refer to intercontinental trade alone and do not take into account that shares of continental trade are also transported by ocean shipping. For a detailed comparison to other European countries see appendix one.

Volume	Import	94 %	5.7 mio t	Value	Import	30 %	CHF 33.4 bn
	Export	92 %	2.3 mio t		Export	17 %	CHF 26.1 bn

Figure 16. Final results of triangulation: Contribution of high-sea shipping on Switzerland's intercontinental import and export trade flows.

2. Commodities – not only handled in the Swiss Rhine ports

A significant proportion of high-sea goods traffic is handled via the Swiss Rhine ports in Basel. In 2019, 6.1 million tonnes were handled in the Swiss Rhine ports, which corresponds to an increase of 29.1% from the 4.7 million tonnes handled in 2018. Just over 5 million tonnes were handled inbound, compared to around one million tonnes in outbound. Freight handling in 2019 exceeded the previous year's result by almost 30%. This was primarily due to the import of petroleum products, which increased by almost 60%. Container traffic on the shipping side climbed to a record level of over 120,000 TEU. Goods transported across the Rhine are mainly liquid and dry bulk goods in terms of volume, as the list of the most important import and export goods shows (see Figure 17).

Goods handled in the Swiss Rhine ports only have a certain intersection with Switzerland's maritime trade flows. On the one hand, large parts of imported stones, soils and building materials, for example, are continental shipments. On the other hand, commodities depending on high-sea shipping are not always carried along the river Rhine. Rail and truck take an important role in connecting the seaports and Switzerland. Non-bulk goods on the way between Switzerland and the seaports are not only transported by ship, but for the most part by truck and rail, either in containers or as general cargo. In

addition, at least for the commodity group of petroleum products, pipelines are a relevant mode of transport as well carrying crude oil between the seaport of Marseille and Western Switzerland to supply, for example, the refinery in Cressier. In upstream transport stages, this crude oil is being carried by oil tankers to Marseille originating in Africa or the Middle East. Almost the entire share of the 7.8 million imported petroleum products is of intercontinental origin.

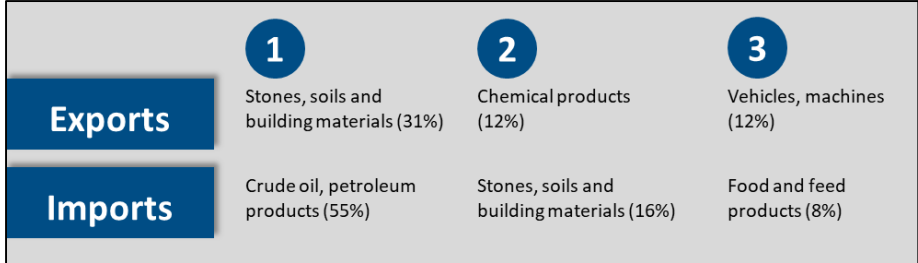


Figure 17. Top 3 commodity types handled in Swiss Rhine ports by volume (2019).¹⁵

3. Vessel types

According to UNCTAD (2020)⁸ the world fleet reached a carrying capacity of 2.1 billion dead weight tonnes (dwt), 81 million dwt more than in 2019 (see Figure 18). Over recent years, tonnage has increased considerably in all segments except general cargo carriers. Bulk carriers recorded an especially rapid increase. Between 2010 and 2020, their share of total carrying capacity rose from 36% to 43%, whereas the share for oil tankers shrank from 35% to 29% and the share for general cargo from 8% to 4%. The global ratio of vessel types and their evolution is also reflected in Europe's major ports as can be seen in the trend analysis (see chapter four5.3).

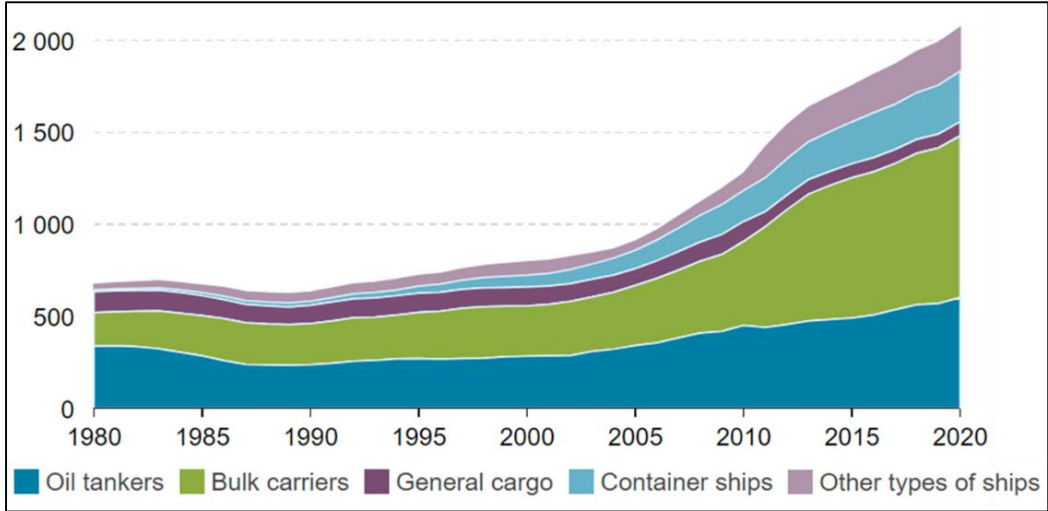


Figure 18. Evolution of world fleet by principal vessel type in millions of dead-weight tonnes.⁸

Vessel types relevant for Switzerland’s maritime trade flows cannot directly be derived from vessel types of the world’s fleet structure, but need to be assessed based on Switzerland’s foreign trade commodity structure. On the one hand, as for other economies, bulk commodities are primarily relevant in Switzerland as well, such as petroleum products, grains and feedstuffs. On the other hand,

¹⁵ Port of Switzerland (2020). Schiffsumschlag nach Warengattung in Tonnen.

the Swiss economy is characterized by particularly high-quality and high-value products, which are primarily transported in containers. In comparison with other European nations, container traffic is to be weighted even higher.

3.3 Interpretations and limitations

In this chapter, findings are further interpreted, and limitations are pointed out.

Expert interviews confirm the findings from the analysis

Preliminary results obtained in the course of the analysis were discussed with experts for the purpose of validation. Both the methodological approach and the results were deemed plausible. In addition, further insights were drawn from the interviews:

- Commodities handled in Swiss Rhine ports: Food and feedstuffs are transported intercontinental for the most part, with an estimated share of 80% to 90%. This includes, for example, wheat from Canada and soybeans for the agricultural industry from Brazil.
- Major vessel types: The importance of containers and container ships is already very high today and will continue to rise in the future. These and other trend statements are incorporated in chapter four.
- Trade flows on the Asian European corridor other than air and sea: The Silk Road was identified as the only significant competitor for high-sea shipping, with limited transport volumes, however. Shares transported by truck was confirmed to be neglectable both in terms of value and volume. The Silk Road is of particular relevance for major production sites, for example, in Germany and France. Especially the automotive industry is a key user of the Eurasian railway corridor. Rail traffic share is supposed to be even less important for companies in Switzerland not exceeding 5% of trade volumes between China and Switzerland.

High-sea shipping dependency is not to be reduced to intercontinental trade flows only

In order to draw reliable conclusions about the share of Swiss foreign trade that depends on high-sea shipping, it is necessary to determine the origin of imports and the final destination of exports. Switzerland's trade relations with other nations do not always embrace the complete supply chain of a product. In chapter 2, when looking at the supply chain of petroleum products, reference was made to the following challenge: Trading partners registered in foreign trade statistics do not have to correspond to the country of origin or the country of final product consumption/usage. In the context of this study, an explicit focus was placed on the analysis of intercontinental trade flows, as the share of trade flows directly depending on maritime shipping can be quantified in a robust way. This approach does not mean that intra-European trade relations do not also directly as well as indirectly depend on maritime shipping.

Trade with European trading partners includes a number of product groups, of which a significant proportion are of non-European origin, including energy sources, primarily crude oil and distillates

(FCA product category 02.2), iron and steel (FCA product category 08.1), chemical raw materials, basic materials and unshaped plastics (FCA product category 06.1) and animal feeds (FCA product category 01.2). If one assumes conservatively that (1) 20% of animal feeds, (2) two thirds of oil and distillates, (3) 20% of chemical raw materials, basic materials and unshaped plastics and (4) 50% of iron and steel are transported to Europe by high-sea vessel in upstream transportation, another 7.3 million tonnes of imports can be characterised as directly depending on high-sea transportation (to compare: these four commodity groups represent 14.2 million or 28% of total imports by volume), which would more than double the maritime share in foreign trade. However, one could go one step further and analyse supply chains end to end to identify which role high-sea shipping takes in upstream and downstream transportation, not covered as exports or imports by foreign trade statistics.

Substantial proportions of continental foreign trade depend on high-sea shipping in upstream and downstream transport stages

The complexity of global supply chains is demonstrated in Figure 19. The automotive industry is a prime example to illustrate this. The starting point is the delivery of a car from Germany to Switzerland. According to Swiss foreign trade statistics, this is registered as an import into Switzerland from Germany. Usually the car is carried by rail or by truck. At this point, one might question whether the product reaches the end consumer by these modes of transport alone? It can be assumed that maritime shipping also plays an important role in the production process. On the one hand, suppliers such as OEMs need raw materials such as steel, aluminium etc. In view of global sourcing, OEMs obtain a large part of vehicle components from suppliers worldwide, and their own vertical integration is well below 50% today. For example, GPS systems and other connectivity components are largely sourced from Asian suppliers. Moreover, even the final assembly of a vehicle may take place outside Europe. BMW and Daimler also manufacture some of the SUVs destined for the European market in the USA, which in turn are shipped by sea from North America to Europe after final assembly. It becomes obvious that when looking at a car being imported from Germany to Switzerland, sea freight is indispensable at many points during the production process.

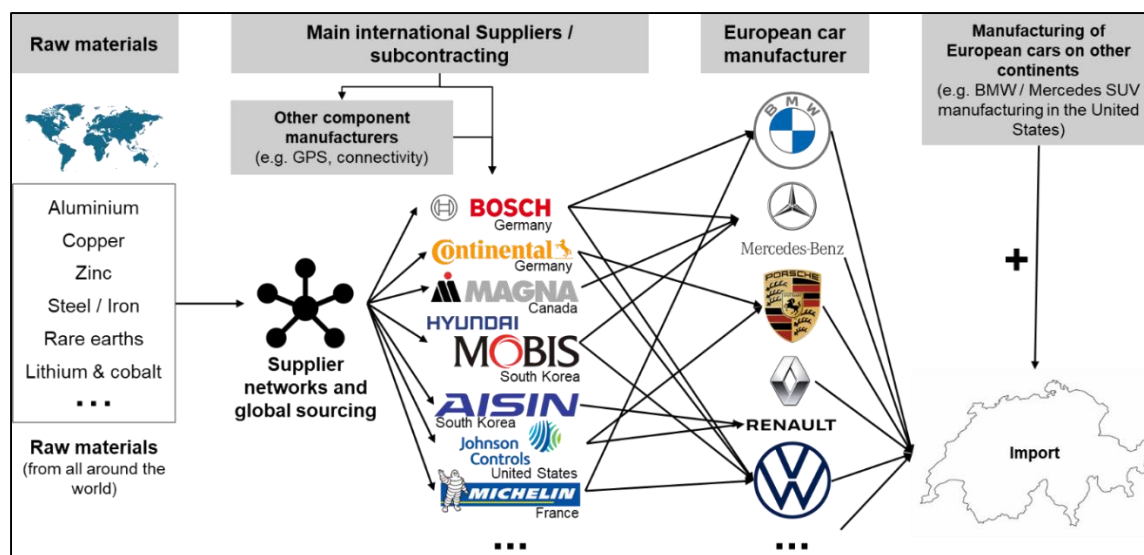


Figure 19. Complexity of global supply chains – example automotive industry.

This in-depth look along a product-related supply chain shows by way of example that it is not only Switzerland's direct trade relations to single nations that must be taken into account in order to answer the question raised at the beginning of this white paper, namely to what extent Swiss trade flows depend on high-sea shipping. Supply chains need to be analysed end to end. However, this is not reflected in official statistics. Therefore, on the one hand, an exact quantification of the volume and value shares of Switzerland's overall foreign trade, which depends on ocean shipping, is not provided. On the other hand, it is emphasized at this point that – in relation to the total tonnage of around 70 million tonnes in Swiss foreign trade, a multiple of the nominally estimated 8 million tonnes depend on high-sea shipping. This is not only illustrated by the example of mineral oil products of which alone 7.8 million were imported in 2019 – primarily from non-European origins. Conservative estimates put Switzerland's foreign trade directly depending on maritime shipping to be at least 20% by volume.

4. Evolution of high-sea shipping trade flows – outlook and future trends

Global economic developments and consequences for high-sea shipping

The global financial crisis in 2008 affected the shipping industry significantly. Triggered by high sea freight rates in the pre-crisis years, private and institutional investors were lured by supposedly safe returns. The collapse of world trade in the crisis years of 2008 and 2009 resulted in enormous overcapacity and historically low freight rates. In the post-crisis years from 2010-2019, global GDP grew by an average of 1.8% per year and by almost 20% over the entire period.¹⁶ Ocean freight volumes grew much faster during this period at around 32% or 2.8% CAGR. Sea freight volumes are positively related to the development of global GDP, i.e. global economic output. Economic growth is expected to continue in the coming years. The COVID-19 crisis demarks a severe short-term effect, in the mid-

¹⁶ International Monetary Fund (2021). World Trade Development.

term it can be assumed that global economy will recover quickly. In line with an assumed annual global economic growth of 1.8%, a disproportionately high development in sea freight can be assumed as well as sea freight volumes tend to hurry ahead. If the development between 2010 and 2019 is projected to the next ten years, one can expect an annual growth of approx. 2.8% in global goods volumes transported by high-sea vessels.

Containerisation and vessel growth

Since the introduction and widespread establishment of standardized containers, the container ship market has developed dynamically. An ongoing shift towards the use of containers can be observed in maritime shipping. Main drivers of this trend not only comprise low freight rates, but practical reasons and economies of scale associated with larger units.

In particular, the cargo capacity of pure container ships, i.e. the number of 20-foot containers (TEU) that can be transported per ship, has accelerated significantly in the last decade. The development of vessel sizes is impressive considering the short time span in which evolutions take place. MSC Pamela, completed in July 2005, was able to load just under 9200 TEU breaking the world records for the number of containers carried on a single vessel at that time. Entering into service at the end of 2014, MSC Oscar was already capable of carrying more than 19'000 TEU. MSC Gülsün, which entered service in 2019, offers a capacity to transport almost 24,000 containers. Experts assume that ships with up to 50,000 standard containers could be built and operated in the future.¹⁷ Unit costs per container can be further reduced and the competitiveness of shipowners increased. However, the bottleneck for this enormous increase in size is and remains the port infrastructure and hinterland connection. However, not only the transport capacity per ship, but also transport volumes will gradually increase in line with economic growth. Depending on the scenario, annual growth in container volumes of between 1.9 % and 3.2 % is expected in the upcoming decades.¹⁷

Changing commodities and cargo flows

As a result of changing commodity types handled in major European seaports there has been a shift in the fleet structure between 2011-2019 (see Figure 20). Liquid bulk goods handled in the ports have lost importance in the period mentioned whereas container and roll-on/roll-off vessels have gained their shares. For the upcoming decades, it can be assumed that the share of liquid bulk goods in total cargo handling will continue to decline. This goes along with the anticipated abandonment of fossil, liquid fuels in order to achieve proclaimed climate goals in Europe. Dry bulk cargos have developed almost constantly, with a tendency towards constant volumes to be expected in the future. The number of containers handled has risen considerably between 2011 and 2019. In line with the general trend of containerisation, a further shift of goods to container ships can be expected. Bulk goods are increasingly being transported in containers, as handling, storage and transport can be significantly

¹⁷ McKinsey & Company (2017). Container shipping: The next 50 years

simplified in this way. The growth in size described above tends to create more favourable transport options.¹⁸






Percentages based on gross weight of seaborne goods handled in main ports by type of shipping, EU-27		2011	2019	2030
Liquid bulk	Both crude oil, products and chemical tankers to transport liquid goods	44%	36%	
Dry bulk	For dry cargo with a high weight to cost ratio such as coal, grain and ore	25%	23%	
Container	Transport of standardised high sea containers, reefer containers and tank containers	18%	25%	
RoRo	Major type used for the transport of road vehicles, also ConRo-vessels	7%	11%	
Other	Other vessel types such as general cargo vessels, livestock carriers, etc.	5%	6%	

Figure 20. Evolution of vessel types in EU-27 major ports – Commodity changes are driving future fleet structure.¹⁹

Swiss Rhine ports continue to take a key function for Swiss foreign trade flows

For Switzerland as a landlocked country, the Rhine connection is of particular importance for the transshipment of bulk goods, not only for the greater Basel area. The Swiss Federal Office for Spatial Development assumes that total imports will increase by 43% by 2040 and exports will grow by 19% compared to 2010.²⁰ At the same time, cargo volumes on the Rhine are expected to decline by about 14% in the period 2010-2040,²¹ largely influenced by reduced mineral oil imports in particular. It remains to be determined to what extent other energy sources could increase the importance of liquid bulk goods again in the future. Experts highlighted the possibility that existing liquid bulk infrastructure might be used for transporting hydrogen which is likely to at least partly replace fossil energy resources. In any case, increasing container volumes are forecasted in the Swiss Rhine ports. A cross study analysis shows that growth rates of 1.8% per year are likely for the container volume development in the Swiss Rhine ports until 2030.²² In an optimistic scenario, container volumes may even increase by 2.5 % per year (see Figure 21).

¹⁸ Eurostat (2020). Gross weight of goods handled in main ports, by type of cargo
¹⁹ Eurostat (2020). Maritime freight and vessels statistics.
²⁰ Bundesamt für Raumentwicklung ARE (2016). Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040.
²¹ Bundesamt für Verkehr BAV (2017). Entwicklungen des UKV in der Schweiz – Vertiefende Betrachtungen.
²² Stoelzle, Preindl (2019). Kurzstudie – Prognose Containeraufkommen.

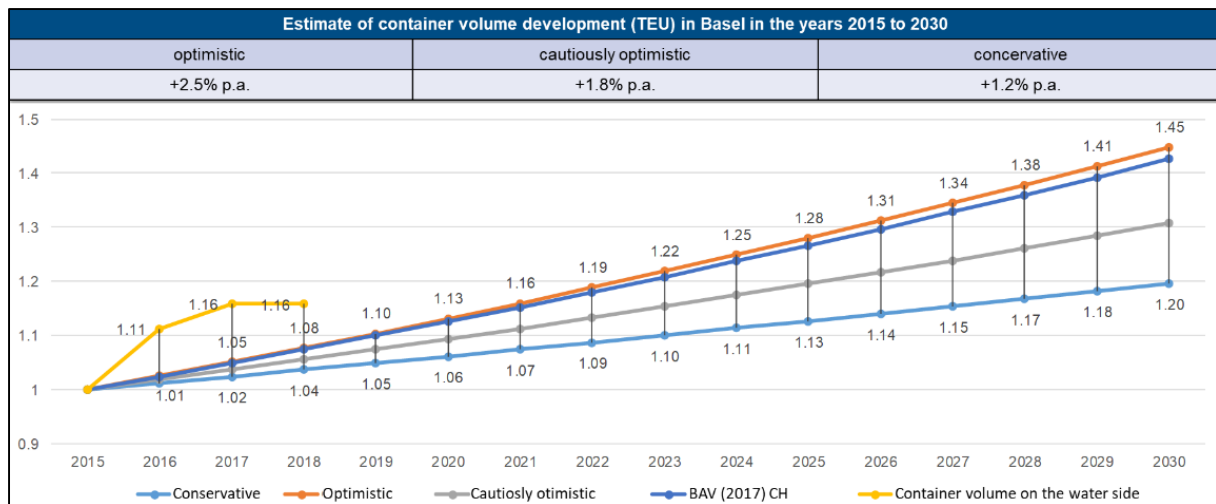


Figure 21. Forecast of the container volume development in Basel in TEU between 2015 and 2030.²²

Infrastructure projects drive international competitiveness

According to the models of the Federal Office for Spatial Development, transit of goods through Switzerland will increase by around 30 % by 2040.²⁰ The intermodal terminal Gateway Basel Nord will be an increasingly important transshipment hub for containerised goods throughout Switzerland. In particular, due to the direct inland waterway connection to the ports of the ARA range (Amsterdam, Rotterdam, Antwerp), the Rhine ports have a transshipment function for Swiss foreign trade as well as for the transit of goods on the New Railway Link through the Alps (NEAT). Prompt implementation of the project is therefore reasonable from an economic and ecological point of view. If the Swiss transshipment facilities do not keep up with other competing transport chains in terms of efficiency, transports might shift to roll into Switzerland with EU trucks, as transport routes seek out the cheapest and fastest route.

Infrastructure projects in neighboring countries such as Italy, France and Germany will also be decisive for Swiss foreign trade relations and the respective modal split, both intercontinental and international. However, depending on the development of the infrastructure and respective transport costs, changed flows of goods may evolve. The Mediterranean's geographical proximity may take on new significance for the Swiss economy.²³

Geopolitical changes not only determine supply chain configurations but could lead to shifts in trade flows. The Russian Federation has announced export restrictions on important foodstuffs such as grain for the coming years. The aim is to ensure the supply of its own population due to a COVID-19-induced drop in income. The instrument of export restrictions might lead to a reallocation of commodity specific trading partners – grains are likely to be increasingly imported from North and South America, driving high-sea transportation volumes. Trade flows are therefore permanently exposed to the risk of being subject to changes as a result of geopolitical decisions.

²³ BAK Basel (2017). Volkswirtschaftliche Bedeutung der Schweizerischen Rheinhäfen und des trimodalen Gateway Basel Nord.

Forecasts of commodity volumes and values transported by seagoing vessels have underlined a pronounced dependency of the Swiss Confederation on high-sea shipping, not only for intercontinental trade flows. Maritime shipping will continue to contribute to securing Switzerland's trade flows in the future. By investing in infrastructure and improving hinterland connections, cargo traffic via the Mediterranean ports could accelerate. The transport of goods via the Rhine will remain of particular importance in the future, even if quantitative volumes should decline for specific commodities due to the increasing shift away from fossil fuels. In any case, container handling will continue to gain relevance and improve Switzerland's connection to European seaports. Increasing freight volumes will predominantly strengthen high-sea shipping for two reasons. First, in terms of volume, air freight is a niche mode of transport. And second, shifting main trade flows to and from China to the Silk Road is not feasible in the medium term due to limited infrastructure. In view of this strong dependency of the Swiss economy on high-sea shipping, its importance is not only underestimated in Switzerland, but hardly perceived by policymakers and the public.

Appendix

Appendix 1: Maritime transportation share in EU-27 foreign trade

Appendix 1. Value share of maritime transportation in total foreign trade per country in EU-27 and Switzerland (2019).²⁴

Value of exports (in billion €)				Value of imports (in billion €)			
Country	Total exports	Share sea	Share sea in %	Country	Total imports	Share sea	Share sea in %
Czech Republic	177,9	7,3	4,1%	Czech Republic	160,0	0,1	0,0%
Hungary	110,6	4,7	4,2%	Luxembourg	21,6	0,8	3,8%
Slovenia	40,2	2,4	5,9%	Latvia	16,9	0,9	5,3%
Luxembourg	14,7	1,0	6,6%	Austria	165,0	9,2	5,6%
Slovakia	80,0	5,5	6,9%	Hungary	107,7	7,5	7,0%
Poland	238,2	17,0	7,1%	Croatia	25,2	2,2	8,5%
Croatia	15,4	1,1	7,4%	Estonia	16,1	1,4	8,6%
Switzerland*	312,0	26,1	8,4%	Ireland	90,0	8,7	9,6%
Latvia	14,0	1,2	8,8%	Slovakia	80,4	7,8	9,7%
Ireland	151,5	16,0	10,6%	Switzerland*	276,1	33,4	12,1%
Lithuania	29,6	3,3	11,3%	Romania	86,3	12,1	14,0%
Netherlands	633,1	76,3	12,1%	Germany	1102,2	175,0	15,9%
Romania	68,7	8,3	12,1%	Sweden	142,0	23,8	16,7%
Austria	159,6	19,6	12,3%	Poland	237,0	40,5	17,1%
Belgium	399,2	50,9	12,8%	Denmark	87,4	14,9	17,1%
Estonia	14,4	1,9	12,9%	France	584,7	101,6	17,4%
France	510,0	79,2	15,5%	Malta	6,3	1,1	17,6%
EU-27	5203,2	832,3	16,0%	Finland	65,9	12,2	18,5%
Bulgaria	29,8	4,9	16,6%	Lithuania	32,0	6,2	19,3%
Portugal	59,9	10,2	17,1%	Slovenia	39,3	7,6	19,3%
Sweden	143,4	26,5	18,4%	Portugal	80,0	15,8	19,8%
Denmark	99,0	19,2	19,4%	EU-27	4950,5	981,4	19,8%
Germany	1330,4	270,9	20,4%	Cyprus	8,2	1,6	20,1%
Malta	2,7	0,6	21,5%	Bulgaria	33,7	7,1	21,0%
Italy	480,4	104,3	21,7%	Belgium	382,0	80,3	21,0%
Spain	298,3	71,5	24,0%	Italy	424,2	115,2	27,2%
Finland	65,6	16,3	24,9%	Spain	333,0	107,9	32,4%
Cyprus	3,1	0,8	26,8%	Netherlands	567,9	198,8	35,0%
Greece	33,9	11,4	33,6%	Greece	55,8	21,3	38,2%

Note: * Values for Switzerland given in billion CHF; Countries in blue are landlocked countries not having a direct coastline; Sea share for Switzerland is based on the result of the analysis conducted in this study, values for EU-27 countries are official data extracted from Eurostat.

²⁴ Eurostat (2020); Swiss Federal Customs Administration (2021)

Appendix 2. Volume share of maritime transportation in total foreign trade per country in EU-27 and Switzerland (2019).²⁴


Volume of exports (in million tonnes)				Volume of imports (in million tonnes)			
Country	Total exports	Share sea	Share sea in %	Country	Total imports	Share sea	Share sea in %
Hungary	463,3	7,2	1,6%	Czech Republic	770,1	0,2	0,0%
Slovakia	356,9	7,1	2,0%	Luxembourg	197,0	1,2	0,6%
Czech Republic	720,1	27,7	3,9%	Hungary	590,8	10,7	1,8%
Austria	634,0	48,6	7,7%	Slovakia	452,0	9,4	2,1%
Luxembourg	81,1	6,3	7,8%	Austria	991,5	52,8	5,3%
Slovenia	232,8	21,7	9,3%	Latvia	160,5	13,1	8,2%
Croatia	178,2	17,2	9,7%	Switzerland	50,8	5,7	11,2%
Poland	1128,1	112,6	10,0%	Estonia	130,7	25,0	19,1%
Switzerland	20,0	2,3	11,5%	Germany	6503,2	1285,9	19,8%
Germany	4247,3	547,7	12,9%	Malta	49,0	9,7	19,8%
Belgium	2757,2	467,9	17,0%	Croatia	204,0	40,4	19,8%
Latvia	233,0	44,4	19,1%	Slovenia	255,0	58,2	22,8%
France	2034,6	393,3	19,3%	Belgium	3048,6	751,4	24,6%
Ireland	179,3	34,9	19,5%	Poland	1634,0	419,3	25,7%
Netherlands	4171,6	813,5	19,5%	Sweden	916,2	290,6	31,7%
EU-27	24608,0	4995,7	20,3%	Ireland	410,7	142,8	34,8%
Denmark	372,0	78,3	21,0%	EU-27	33916,3	11791,5	34,8%
Estonia	169,3	35,8	21,2%	Cyprus	62,4	22,2	35,6%
Lithuania	314,0	78,8	25,1%	Romania	538,7	203,6	37,8%
Portugal	390,4	108,7	27,8%	Denmark	535,2	203,6	38,0%
Italy	1469,9	454,8	30,9%	Finland	571,0	220,6	38,6%
Sweden	915,5	286,2	31,3%	Lithuania	340,9	138,1	40,5%
Malta	11,3	3,6	31,9%	France	3427,8	1402,2	40,9%
Bulgaria	308,8	107,1	34,7%	Bulgaria	281,1	126,1	44,9%
Finland	512,2	185,2	36,2%	Netherlands	4964,9	2413,0	48,6%
Romania	456,7	169,4	37,1%	Portugal	621,0	306,3	49,3%
Spain	1792,2	667,3	37,2%	Italy	3105,7	1597,6	51,4%
Greece	447,7	247,1	55,2%	Spain	2588,2	1655,6	64,0%
Cyprus	30,6	23,2	75,9%	Greece	566,0	391,8	69,2%

Note: * Values for Switzerland given in billion CHF; Countries in blue are landlocked countries not having a direct coastline; Sea share for Switzerland is based on the result of the analysis conducted in this study, values for EU-27 countries are official data extracted from Eurostat.

Appendix 2: Study Inventory


The order of the listed sources in the study inventory is solely chronological according to the time of use of the source and does not reflect any valuation of the content. In order to be included in the study inventory, at least one of the following selection criteria is fulfilled:

- Data and information specific to the study objective
- Possibility to derive or extrapolate data from the source
- Evidenced statements on trends and forecasts
- Possibility to derive analogies

5.1 Shortlist  Logistics Advisory Experts GmbH


Study «Air Freight Logistics Study 2020»

Profile




Title: Air Freight Logistics Study 2020
 Publisher: IG Air Cargo
 Author: ISCM-HSG
 Country: Switzerland
 Publication date: 08 / 2020


B

 **Period under consideration**

2019
Evolution since 2010

 **Focal topic**

- Analysis of the importance of **air freight logistics** for the Swiss economy
- Chapter 1 "Air freight logistics market" specifically addresses the **modal split in Swiss foreign trade**
- Value and tonnage share of **sea freight in intercontinental transport** for the Swiss economy
 - Import: value share 54.6% / tonnage share 98.9%
 - Export: value share 23% / tonnage share 94.8%


 **Methodology**

To determine the share of sea freight in foreign trade, the following procedure was followed using FCA data:

1. Exclusion of all intra-European flows of goods to determine intercontinental trade
2. Thereof exclusion of air freight to determine the share of sea freight


- **Assumption:** Flown freight leaves Switzerland by air or Road Feeder Services, **non-flown goods are shipped by sea freight**. For North and South America, the dualistic division into sea and air freight is fully applicable, as no other modes of transport are possible.
- **Limitation:** The approach is only roughly accurate for countries like China (rail via New Silk Road) or Morocco (road freight), for example, as the actual capacities via road and rail are marginal but existing

Appendix 3: ISCM-HSG (2020). Air Freight Logistics Study 2020.

5.1 Shortlist  Logistics Advisory Experts GmbH


Study «The economic importance of the Swiss Rhine ports» (1/3)

Profile




Title: Die Volkswirtschaftliche Bedeutung der Schweizerischen Rheinhäfen
 Publisher: BAK Basel Economics AG
 Author: BAK Basel Economics AG
 Country: Switzerland
 Publication date: 12 / 2016


B

 **Period under consideration**

2016
Evolution since 1980

 **Focal topic**

- Analysis of the importance of the **Port of Switzerland** for the Swiss economy
- Investigation of **Supply- and Demand-Side** effects with Implications for the Swiss Economy
- Development and current status of **transport volumes and values** in comparison with the other **means of transport**
- Goods traded abroad via the **Swiss Rhine ports** and subdivision into categories of goods

 **Methodology**

- Methodical subdivision into investigation of demand-side and supply-side effects
 - **Demand-side:** Direct effects (employment and gross value added), secondary effects, (port industry orders, employee consumption demand, and capital expenditures) and total economic effects resulting from the secondary effects
 - **Supply-side:** functions of the Rhine ports, through which other elements of the Swiss economy as a whole are supported to provide efficient and sustainable economic services (Transport infrastructure, safety and sustainability functions)

Appendix 4.1: BAK Basel Economics AG (2016). The economic importance of the Swiss Rhine ports.

Study «The economic importance of the Swiss Rhine ports» (2/3)

Profile



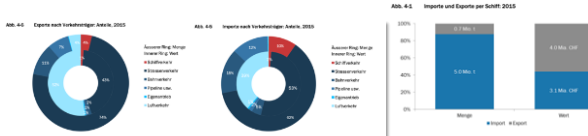
Title: Die Volkswirtschaftliche Bedeutung der Schweizerischen Rheinhäfen
Publisher: BAK Basel Economics AG
Author: BAK Basel Economics AG
Country: Switzerland
Publication date: 12 / 2016

Limitations

- The study focuses on the foreign trade of Switzerland
- Only the modes of transport used when crossing the Swiss national border are included in the representations and statistics - ocean shipping is thus excluded

Key findings

- A total of **5.7 million tonnes or CHF 7.1 billion** were transported across the Swiss border (=8% of total foreign trade volume)
 - Import: **5.0 million tonnes or CHF 3.1 billion** → just under 10% of total import tonnage of 51.9 million tonnes
 - Export: **0.7 million tonnes or CHF 4.0 billion** → approximately 4% of total import tonnage of 18.4 million tonnes



Appendix 4.2: BAK Basel Economics AG (2016). The economic importance of the Swiss Rhine ports.

Study «The economic importance of the Swiss Rhine ports» (3/3)

Profile



Title: Die Volkswirtschaftliche Bedeutung der Schweizerischen Rheinhäfen
Publisher: BAK Basel Economics AG
Author: BAK Basel Economics AG
Country: Switzerland
Publication date: 12 / 2016

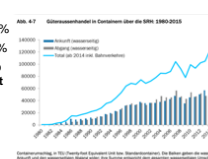
Key findings

- Shares of **ship imports and ship exports** in total trade
 - in **fossil commodities** particularly high at 20.5% and 26.8% of the volume
- Foreign **container** trade continues to **develop dynamically**
 - Further shifts to the container are expected

ARA-Range:

- Changes in the modal split of the ports of **Rotterdam** and **Antwerp** expected, explicitly **container-based hinterland-transport** for capacity and sustainability reasons
- Less transport by **road** but shift to **rail** and **inland waterways**
 - Rotterdam:** Increase inland shipping share from 37% to 45%
 - Antwerp:** Increase inland navigation share from 36% to 42%
- Close links between the Swiss ports and **Rotterdam** and **Antwerp** mean that this change in the modal split will have a **positive effect** on the share of shipping

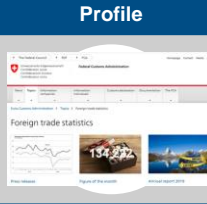
Warengruppe	Import		Export	
	Anteil	Wert	Anteil	Wert
Total	9.9%	3.3%	3.6%	1.4%
Aggregierte	6.0%	4.7%	3.3%	2.6%
Fossil-Energieerzeuger	20.5%	22.5%	26.8%	13.6%
Eisen, Stähle, Erden	8.4%	4.8%	3.8%	4.8%
Kunststoffe	8.2%	2.2%	1.0%	2.4%
Chemie, Pharma, Kunststoffe	3.2%	0.7%	1.9%	1.3%
Maschinen, Metallbaugruppen	4.3%	0.3%	1.8%	0.2%
Maschinen, Apparate, Fahrzeuge	1.1%	0.5%	4.6%	2.8%
Metalle, Metalle	4.2%	1.4%	5.6%	1.4%
Sonstige Güter	2.4%	0.3%	1.2%	0.1%



Appendix 4.3: BAK Basel Economics AG (2016). The economic importance of the Swiss Rhine ports.

Statistics/Reports «EZV foreign trade statistics»

Profile



Title: Foreign trade statistics
Publisher: EZV / Foreign Customs Administration
Author: EZV / Foreign Customs Administration
Country: Switzerland
Publication date: 2020

Period under consideration

2019
 Date recorded for every single year

Focal topic

- Detailed key figures on Swiss foreign trade
- differentiation by trading partner, commodity group, mode of transport

Methodology / Insights / Limitations


- Overview of goods flows in foreign trade, commodity groups, modes of transport and trading partners of Switzerland (in terms of value & volume)
- Export and import statistics record modes of transport at border crossings. Intermodal transport chains are not covered
- Key source for bottom-up approach

Appendix 5: EZV (2020). Foreign trade statistics.

5.1 Shortlist LAE Logistics Advisory Experts GmbH

Study «The Economic Value of the EU Shipping Industry, 2020»

Profile



Title: The Economic Value of the EU Shipping Industry, 2020

Publisher: The European Community Shipowners' Associations (ECSA)

Author: Oxford Economics

Country: Europe

Publication date: 10 / 2020

B

Period under consideration

2019
Evolution since 2010

Focal topic

- Estimates of the **economic contribution** of the EU shipping industry
- Concentrates on **two measures** of the industry's economic contribution:
 - the gross value-added contribution to GDP (€54 billion in 2018)
 - employment, in terms of the number of employees (685,000 people directly employed in 2018)

Methodology


- Consistent with the earlier studies, the shipping industry has been defined by ECSA as:
 - the transport of goods by sea (both containerised and non-containerised);
 - the transport of persons by sea (both on ferries and on cruise ships);
 - service and offshore support vessels, such as ships laying or repairing
 - undersea cables or pipelines; prospecting for oil; conducting oceanographic research; diving assistance; undertaking undersea work and servicing offshore wind farms, oil and gas platforms;
 - towage and dredging activities at sea.

Appendix 6: Oxford Economics (2020). The Economic Value of the EU Shipping Industry, 2020.

5.1 Shortlist LAE Logistics Advisory Experts GmbH

Statistics/Reports «IMW – International Monetary Fund»

Profile



Title: World Trade development

Publisher: International Monetary Fund

Author: International Monetary Fund

Country: United States

Publication date: 2020

A

Period under consideration

1970-2029
Date recorded for every single year

Focal topic

- Development of GDP per state
- Development of the worldwide sea freight volume

Methodology / Insights / Limitations

- Pure representation of the growth of the gross domestic product per year and country
- Year-on-year development of sea freight volumes

Key findings


- Due to own calculation:
 - While GDP has grown by an average of 1.8% per year from 2010 to 2019, sea freight volumes have increased by around 2.8% per year. According to this, trade volumes at sea is showing stronger growth than the overall economy

Appendix 7: International Monetary Fund (2020). World Trade development.

5.1 Shortlist LAE Logistics Advisory Experts GmbH

Statistics/Reports «Review of Maritime Transport»

Profile



Title: Review of Maritime Transport

Publisher: United Nations (UN)

Author: United Nations (UN)

Country: Global

Publication date: 12 / 2020

A

Period under consideration

2020
Evolution since 1970

Focal topic

- Analysis of structural and cyclical changes affecting seaborne trade, ports and shipping, as well as an extensive collection of statistics
- International maritime trade under severe pressure due to Covid19
- Freight rates and sustainable shipping
- Development of international maritime trade, selected years


Key findings

- Switzerland is ranked 13th in the top 25 ship-owning economies, as of Jan. 1, 2020
- Switzerland is ranked 17th in the Ownership of world fleet, ranked by carrying capacity in dead-weight tons, as of Jan. 1, 2020

Appendix 8.1: UNCTAD (2020). Review of Maritime Transport.

Statistics/Reports «Review of Maritime Transport»

Profile



Title: Review of Maritime Transport
Publisher: United Nations (UN)
Author: United Nations (UN)
Country: Global
Publication date: 12 / 2020

A

Key findings

Table 2.3 Ownership of world fleet, ranked by carrying capacity in dead-weight tons, 2020

Country or territory of ownership	Number of vessels			Dead-weight tonnage			Foreign flag as a percentage of total	Total as a percentage of total
	National flag	Foreign flag	Total	National flag	Foreign flag	Total		
1 Greece	671	3 977	4 648	60 827 479	303 026 753	363 854 232	83.28	17.77
2 Japan	909	3 001	3 910	36 805 225	196 329 652	233 134 877	84.21	11.38
3 China	4 569	2 300	6 869	99 484 023	128 892 849	228 376 872	56.44	11.15
4 Singapore	1 493	1 368	2 861	74 754 209	62 545 517	137 299 726	45.55	6.70
5 Hong Kong, China	883	807	1 690	72 505 185	28 452 208	100 957 393	28.18	4.93
6 Germany	205	2 299	2 504	8 340 596	81 062 481	89 403 077	90.67	4.37
7 Republic of Korea	778	837	1 615	14 402 899	66 179 736	80 582 635	82.13	3.93
8 Norway	383	1 660	2 043	1 884 535	62 051 275	63 935 810	97.05	3.12
9 Bermuda	13	529	542	324 902	60 088 969	60 413 871	99.46	2.95
10 United States	799	1 131	1 930	10 237 585	46 979 245	57 216 830	82.11	2.79
11 United Kingdom	317	1 027	1 344	6 835 538	46 355 337	53 190 875	87.15	2.60
12 Taiwan Province of China	149	650	900	6 636 271	44 255 000	50 891 270	86.96	2.48
13 Monaco	473	473	473	43 831 888	43 831 888	87 663 776	100.00	2.14
14 Denmark	25	921	946	31 435	42 683 040	42 714 475	99.93	2.09
15 Belgium	113	188	301	10 040 100	20 658 108	30 698 208	67.29	1.50
16 Turkey	449	1 079	1 528	6 656 989	21 433 413	28 090 402	76.30	1.37
17 Switzerland	26	401	427	1 113 387	25 365 225	26 478 612	95.80	1.29
Subtotal, top 25 shipowners	20 338	26 671	46 909	540 427 639	1 411 830 198	1 952 257 837	72.32	65.33
Rest of world and unknown	3 027	3 015	6 042	38 513 139	59 294 400	97 717 610	61.85	4.67
World total	23 375	29 586	52 961	578 940 769	1 471 634 678	2 047 975 447	71.8	100.0

Appendix 8.2: UNCTAD (2020). Review of Maritime Transport

Statistics/Reports «Eurostat data: Gross weight of goods handled in main European ports 2019, by type of cargo»

Profile



Title: Gross weight of goods handled in main European ports
Publisher: Eurostat / European Union
Author: Eurostat / European Union
Country: Europe
Publication date: 2020

A

Period under consideration
 2017-2020
 Date recorded for every quarter


Focal topic
 • Changes in trade volumes in european ports

Key findings:
 • Ongoing shift from bulk to containers
 • data for 2011:
 • bulk goods (dry and liquid): 70%
 • containers: 18%
 • ro-ro units: 7%; other cargo: 5%
 • data for Q4 2019:
 • bulk goods: 59%
 • Containers: 25%
 • Ro-Ro units: 11%, other cargo: 6%

Appendix 9: Eurostat (2020). Gross weight of goods handled in main European ports

Statistics/Reports «Shipping and World Trade: Predicted Increases in World Seaborne Trade, GDP and Population»

Profile



Title: Shipping and World Trade: Predicted Increases in World Seaborne Trade, GDP and Population
Publisher: International Chamber of Shipping (ICS)
Author: ICS
Country: United Kingdom
Publication date: 2020

B

Period under consideration
 2019
 Date recorded for every single year

Focal topic
 • presentation of facts about the shipping industry
 • High-sea shipping share in intercontinental trade

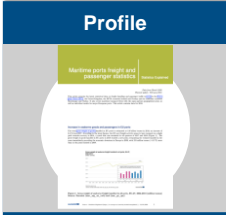
Key results
 • Intercontinental trade flows, Switzerland's modal split corresponds to the global one
 • 90% of intercontinental trade carried by ships
 • 95% of UK trade is carried by ships (however, note the geographical differences to continental Europe)

Appendix 10: International Chamber of Shipping (ICS) (2020). Shipping and World Trade: Predicted Increases in World Seaborne Trade, GDP and Population.

5.1 Shortlist LAE Logistics Advisory Experts GmbH

Statistics/Reports «Maritime ports freight and passenger statistics»

Profile



Title: Maritime ports freight and passenger statistics

Publisher: Eurostat / European Union

Author: Eurostat / European Union

Country: Europe

Publication date: 2020

A

Period under consideration
2020
Data collected within the framework of the EU maritime transport statistics directive

Focal topic

- statistical data on freight handling and passenger traffic in ports in the European Union (EU)
- additional the United Kingdom, the EFTA countries Iceland and Norway and the candidate countries

Key results


- gross weight of total freight handling to/from main European ports (>1mio tons handled annually)
 - 3.5 billion tons in 2019 (due to inbound and outbound counting figure includes double counting)
 - 3,018 billion tons (estimation without double counting)
 - 70% were transported to or from ports outside the EU (intercontinental)

Appendix 11: Eurostat (2020). Maritime ports freight and passenger statistics.

5.1 Shortlist LAE Logistics Advisory Experts GmbH

Study «Outlook for Swiss passenger and freight transport up to 2040» (1/3)

Profile



Title: Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040

Publisher: Bundesamt für Raumentwicklung (ARE)

Author: ARE

Country: Switzerland

Publication date: 08 / 2016

A

Period under consideration
2010 - 2040

Focal topic

- Study goal:** Model-based analysis, evaluation and documentation of scenarios of traffic development in passenger and freight transport in Switzerland until 2040 based on if-then analyses.

Methodology


- The project was implemented in close cooperation with the other Federal Departments of the Environment, Transport, Energy and Communications (DETEC) offices and with the support of various experts from outside the federal government.
- Creation of a reference scenario as well as three further scenarios:
 - Balance - sustainability, resource protection, prioritisation of public transport.
 - Sprawl - individual mobility has priority over collective mobility
 - Focus - Different development Urban-rural comparison takes centre stage
- Differentiation among transport modes (Rhine shipping is only partially included), commodity groups, types of transport (inland transport, import, export and transit transport).
- Reference units: Volume (in tonnes), transport performance (in tonne-kilometres), mileage (in vehicle km - road only).

Appendix 12.1: Bundesamt für Raumentwicklung (ARE) (2016). Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040.

5.1 Shortlist LAE Logistics Advisory Experts GmbH

Study «Outlook for Swiss passenger and freight transport up to 2040» (2/3)

Profile



Title: Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040

Publisher: Bundesamt für Raumentwicklung (ARE)

Author: ARE

Country: Switzerland

Publication date: 08 / 2016

A

Influencing factors / premises

Influencing factors:

- Population and demography:**
 - Population growth: approx. +1% p.a. until 2030, then slight slowdown in growth.
 - Demographic ageing: share of over-65s increases from 17% (2016) to 23% (2040), share of children and young people decreases from 20% (2016) to 19% (2040).
- GDP:** Economic growth: approx. +1.5% p.a. until 2020, then slight slowdown in growth. Growth remains above +1% p.a. until 2040. A stable economic development is assumed for the longer term.
- Changing sector development (2011 - 2030):**
 - Agriculture decreases by -1.8%.
 - Industrial sector increases by +23.2%, but is still below the overall sector average.
 - Service sector grows at an above-average rate of +31.8%.
- Trends in freight transport performance by mode (2010 - 2040):**
 - Domestic transport: +43% / Export: +19% / Import: +43% / Transit: +30%

Premises:

- Future increases in **oil and electricity prices**
- Spatial planning:** Further urban sprawl in population distribution (however, decreased compared to status quo)
- Transport policy and transport offer:** Retention of current transport policy in the future as well as a slight increase in the LSVA according to the current legal basis.
- Transport costs:** Moderate increase in transport costs with slight advantages in favour of rail.
- Goods** are becoming **lighter and of higher quality** - the transport intensities in terms of value versus quantity continue to decrease. Nevertheless, the often expected end of bulk goods transports is not in sight.
- Industry 4.0 and similar **digitalisation trends** change little in the basic structure of the end products to be produced; multimodality is thus increasingly taking an important place in freight transport.

Appendix 12.2: Bundesamt für Raumentwicklung (ARE) (2016). Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040.

Study «Outlook for Swiss passenger and freight transport up to 2040» (3/3)

Profile

Title: Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040

Publisher: Bundesamt für Raumentwicklung (ARE)

Author: ARE

Country: Switzerland

Publication date: 08 / 2016

A

Key findings

- Based on the assumptions of the reference scenario, the volume and transport performance of freight transport will increase by a good third by 2040 compared to 2010. In 2040, 574 million tonnes (+37%) will have to be transported - on the Swiss infrastructure, these volumes will then generate a transport performance of 36.6 billion tonne-kilometres (+37%).
- According to the study, the traffic volume in Rhine shipping will decrease by -14.2% from 2010 to 2040 (-0.5% p.a.). This development is particularly influenced by mineral oil imports.

Aufkommen nach Verkehrsmittel	Schweiz		Europa		Welt	
	2010	2040	2010	2040	2010	2040
Land	429,010	519,210	1,147,210	1,212,210	2,676,210	3,121,210
Seefahrt	18,710	15,710	18,710	15,710	18,710	15,710
Luft	10,290	10,290	10,290	10,290	10,290	10,290
Summe	457,990	545,210	1,376,210	1,438,210	2,805,210	3,346,210

Limitations

- The focus of the study in the area of freight transport is on the transport modes of road and rail. Rhine shipping is only examined in terms of volume in tonnes. Ultimately, the freight volume in inland waterway transport is dominated in particular by mineral oil. Therefore, conclusions can only be drawn indirectly from the perspectives on the overall growth of intermodal transport.
- Due to different sources, there may be deviations in the data basis. This is due to the different methods used to determine the data.

Appendix 12.3: Bundesamt für Raumentwicklung (ARE) (2016). Perspektiven des Schweizerischen Personen- und Güterverkehrs bis 2040.

Study «Developments in unaccompanied combined transport in Switzerland - In-depth considerations» (1/2)

Profil

Title: Entwicklungen des UKV in der Schweiz - Vertiefende Betrachtungen

Publisher: Bundesamt für Verkehr (BAV)

Author: INFRAS

Country: Switzerland

Publication: 08 / 2017

A

Period under consideration

Phase 1: 2015 - 2030
Phase 2: 2030 - 2040
Data base: 2015

Focal topic

- Analysis of the development of Swiss unaccompanied combined transport between 2015 and 2040

Methodology

Sources:
Only few studies with prospective statements whose comparability is associated with limitations:

- Object of observation may differ (tonnage, consignments, TEU, handling),
- Differing time frame of reference
- Different assumptions regarding future structural or transport-related/political developments.

Therefore, a literature analysis (e.g. Federal Statistical Office as well as Swiss Rhine Ports for retrospective considerations) as well as experts (17 persons) and existing forecasts are used as a basis.

Differentiation:
Inland transport, import and export (rail UCT and Rhine shipping).

Reference units:

- Volume (in million net tons), containers* (in million net tons / number in units) as well as TEU (number in units) and terminal handling (in TEU).

* This refers to containers, swap bodies and semi-trailers suitable for intermodal transport.

Appendix 13.1: INFRAS (2017). Developments in unaccompanied combined transport in Switzerland - In-depth considerations.

Study «Developments in unaccompanied combined transport in Switzerland - In-depth considerations» (2/2)

Profil

Title: Entwicklungen des UKV in der Schweiz - Vertiefende Betrachtungen

Publisher: Bundesamt für Verkehr (BAV)

Author: INFRAS

Country: Switzerland

Publication: 08 / 2017

A

Key findings

For the handling of containers imported and exported via Rhine shipping, a volume of 153,000 TEUs is expected in Switzerland by 2030 (+48% compared to 2015 [2.7% p.a.]) and a volume of 166,000 TEUs by 2040 (+13% compared to 2030 [0.8% p.a.]). Regionally for Basel, domestic traffic is expected to increase from 42,000 TEU (2015) to 57,000 TEU (2030), i.e. an increase of 37%, and by 2040 63,000 TEU (again +10% compared to 2030). Terminal throughput (TEU) in Switzerland is expected to increase by 42.6% from 2015 to 2030, i.e. 2.39% growth p.a.

Limitations

The following influencing variables were not included in the forecast or were not shown:

- Environmental influences such as low water on the Rhine.
- Development of seaports (ARA range) and development of ship sizes in maritime freight transport only taken into account to a limited extent.
- For comparability of the reference units, the data were standardised using conversion factors. This can lead to deviations in the data basis.

Appendix 13.2: INFRAS (2017). Developments in unaccompanied combined transport in Switzerland - In-depth considerations.

Study «Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures, incl. Industrial policy measures» (1/4)

Profile



Title: Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures

Publisher: European Commission

Author: EY, Fraunhofer, TNO, ...

Country: Europe

Publication date: 05 / 2019

A

Period under consideration
2016
Evolution since 1980

Focal topic

- Identification and analysis of levers that could promote the development of waterborne transport.
- Analysis of the existing role and the realistic potential of EU waterborne transport
- Development of recommendations for strategies and measures to realise this potential in a 2020-2030 timeframe

Methodology

- **1st stage:** critical review of the past trends, current situation and recent developments
- **2nd stage:** identification of the most important policy measures and division into four policy scenarios and variants
- **3rd stage:** potential of these scenarios and variants has been tested using a European Network Transport Model dedicated to freight transport at EU level
- **4th stage:** assessment of the policy measures and policy scenarios against the goals of the European Union's transport policy

Appendix 14.1: EY, Fraunhofer, TNO (2019). Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures.

Study «Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures, incl. Industrial policy measures» (2/4)

Profile



Title: Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures

Publisher: European Commission

Author: EY, Fraunhofer, TNO, ...

Country: Europe

Publication date: 05 / 2019

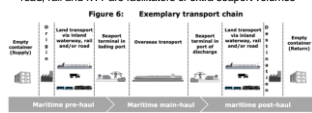
A

Limitations

- Projections for 2030 are using assumptions on GDP growth, price of oil, exchange rates etc.
- The modelling tool is using several databases

Key findings

- **2000-2014:**
 - total EU traffic in ports has increased by 1.7% per year, with a high increase in container traffic (5.5% per year) as compared to bulk traffic (1.3% for dry bulk and 0.5 for liquid bulk)
 - extra-EU traffic with 2.6% versus Intra-EU traffic with 0.9% growth per year
 - moderate growth of IWT traffic of 1.1% per year (but remarkable growth in IWW container traffic of 5% per year)
 - Subdivision of the development between 2000 and 2007 and 2007 and 2014
- globally, almost 90 percent of international trade is moved by maritime transport
- seaports are the nodes linking waterborne transport and hinterland transport modes
- road, rail and IWT are facilitators of extra seaport volumes



Appendix 14.2: EY, Fraunhofer, TNO (2019). Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures.

Study «Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures, incl. Industrial policy measures» (3/4)

Profile



Title: Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures

Publisher: European Commission

Author: EY, Fraunhofer, TNO, ...

Country: Europe

Publication date: 05 / 2019

A

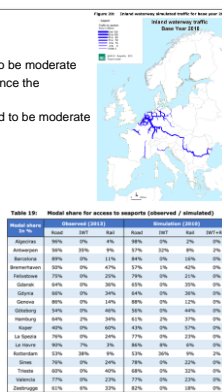
Key findings

Expected development on IWW:

- for inland waterways, the growth of **dry bulk freight** is expected to be moderate
 - demand for coal and iron ore are expected to decrease, hence the transport via IWW as well
- for inland waterways, the growth of **liquid bulk freight** is expected to be moderate
- significant potential for maritime **containers**
 - due to containerisation including reefer containers

Modal shares:

- Strongly differing modal shares depending on the port
- Antwerp and Rotterdam are leaders due to the Rhine connection
 - raw materials are the main market for the use of IWT (with 33 billion of tons.km / 23% of the volume).
 - Coal, containers and chemicals represent nearly 10% of the volume



Appendix 14.3: EY, Fraunhofer, TNO (2019). Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures.

Study «Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures, incl. Industrial policy measures» (4/4)

Profile



Title: Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures

Publisher: European Commission

Author: EY, Fraunhofer, TNO, ...

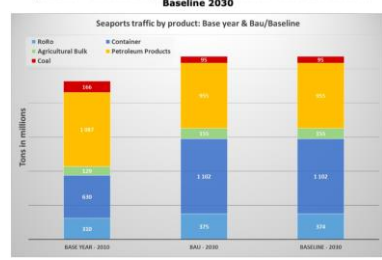
Country: Europe

Publication date: 05 / 2019

Key findings

- container traffic increases significantly with a 75% growth between 2010 (base year) and 2030
- agricultural bulk (import and export) and RoRo maritime links traffic each increasing by 20%
- products related to energy decrease by 12% and 43% for coal

Figure 22: Evolution of port traffic by products: Base Year 2010 & Baseline 2030



Appendix 14.4: EY, Fraunhofer, TNO (2019). Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures.

Statistics/Reports «World Fleet Statistics 2019» (1/2)

Profile



Title: World Fleet Statistics 2019

Publisher: IHS Markit

Author: IHS Markit

Country: Global

Publication date: 2020

Period under consideration
2019

Focal topic

- Annual report: providing the composition of the world fleet as of the 31st December - shiptype oriented report with regard to cargo carrying ships

Key results

- CH is ranked 13 worldwide referring to Gross Tonnage of merchant fleet controlled, ranked 6th in Europe

Country	Gross Tonnage (GT)	Merchant Fleet (MT)	Flagged Fleet (FF)	Controlled Fleet (CF)	Controlled by CH (CC)
China	1,007,358,943	1,136,182,217	1,136,182,217	1,136,182,217	1,136,182,217
USA	429,195,252	429,195,252	429,195,252	429,195,252	429,195,252
UK	148,105,000	148,105,000	148,105,000	148,105,000	148,105,000
Germany	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
France	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Italy	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Spain	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Japan	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
South Korea	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
India	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Indonesia	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Malaysia	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Singapore	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Philippines	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Thailand	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Vietnam	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Other	127,105,000	127,105,000	127,105,000	127,105,000	127,105,000
Total	279,150,000	279,150,000	279,150,000	279,150,000	279,150,000

ShipType Category	STATCODE	LEVEL	4	4000000	Net	Gwt	GT	Age
Bulk Dry	05	1	100	100	803,294,941	439,515,928	9	
Crude Oil Tanker	20	1	100	100	445,581,876	227,817,263	18	
Container	70	1	100	100	266,476,807	227,817,263	12	
Chemical	80	1	100	100	111,508,366	105,664,792	13	
General Cargo	90	1	100	100	14,815	14,267,236	24	
Oil Products Tanker	30	1	100	100	52,774,405	32,591,433	22	
LNG Tanker	40	1	100	100	43,834,895	16,504,267	10	
LPG Tanker	50	1	100	100	24,839,968	21,532,149	15	
Ro-Ro Cargo	60	1	100	100	20,309,020	16,689,571	17	
Other Bulk Dry	10	1	100	100	22,817,263	8,964,338	21	
Other Cargo Carrying	20	1	100	100	1,051,891,132	1,042,999,433	21	

Appendix 15.1: IHS Markit (2020). World Fleet Statistics 2019.

Statistics/Reports «World Fleet Statistics 2019» (2/2)

Profile



Title: World Fleet Statistics 2019

Publisher: IHS Markit

Author: IHS Markit

Country: Global

Publication date: 2020

Period under consideration
2019

Focal topic

- Identification of the main vessel types and their subcategories

Key results

- Bulk carrier and tanker Common type of ship in international transport (#number of vessels, dwt)
 - Dry bulk (#10,419, 803.294.941 dwt), crude oil tanker (#2,781, 445.581.876 dwt), container (#5,214, 266.476.807 dwt), chemical (#5,412, 111.508.366 dwt), general cargo (#14,815, 78.262.397 dwt)
 - Demand for bulk goods reflected in number of ships

Tankers	Bulk Carriers	Container Carrier	General Cargo Carrier	Roll On Roll Off Carrier	Miscellaneous
<ul style="list-style-type: none"> Liquefied Gas Chemicals Oil Other Liquids 	<ul style="list-style-type: none"> Dry Bulk 	<ul style="list-style-type: none"> container reefer 	<ul style="list-style-type: none"> general cargo heavy goods livestock 	<ul style="list-style-type: none"> self driving vehicles general cargoes container (ConRo) 	<ul style="list-style-type: none"> offshore fishing livestock pilot/tugs

Appendix 15.2: IHS Markit (2020). World Fleet Statistics 2019.

Statistics/Reports «Swiss Shipping Industry Scenario Analysis» (1/2)

Profile



Title: Swiss Shipping Industry Scenario Analysis
Publisher: Swiss Trading and Shipping Association (STSA)
Author: Oxford Economics
Country: Switzerland
Publication date: 2017

B

Period under consideration
 2016
 Evolution till 2027

Focal topic

- Consideration of the potential economic impact of the tonnage tax on the Swiss shipping industry over the coming decade - based on an analysis of the controlled fleet

Methodology

- Assessment of how the Swiss merchant fleet could grow if current trends continue
- Development of alternative scenarios to show how the Swiss fleet could evolve over the next ten years, based on the growth observed in other European countries after the introduction of a tonnage tax
- Estimation of how the economic impact of the Swiss shipping industry could evolve in terms of GDP and employment under each scenario, based on the assumption that the economic impact varies in direct proportion to the size of the fleet

Appendix 16.1: Oxford Economics (2017). Swiss Shipping Industry Scenario Analysis.

Statistics/Reports «Swiss Shipping Industry Scenario Analysis» (1/2)

Profile



Title: Swiss Shipping Industry Scenario Analysis
Publisher: Swiss Trading and Shipping Association (STSA)
Author: Oxford Economics
Country: Switzerland
Publication date: 2017

Limitations

- Change in merchant fleet calculated on assumption of changed tonnage tax

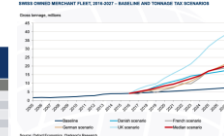
Key findings

- Swiss shipping industry could support direct employment in Switzerland of between 8,000 and 17,000, under various tonnage tax scenarios in 2027
- Estimation (2016), that the direct GDP contribution of the Swiss shipping industry was CHF 2.4 billion
- Assumption, that the direct GDP contribution grows in direct proportion to the controlled fleet
 - direct impact would be CHF 4.2 billion in 2027 in the baseline scenario

Potential economic impact of the Swiss shipping industry^{1,2}

Year	Scenario	Controlled fleet (Gross tonnage, millions)			GDP (CHF, 2016 prices, billions)			Employment in Switzerland (000s)		
		Total	Direct	Total	Direct	Indirect	Induced			
2016	Baseline	4.1	2.4	4.7	2	15	22			
2027	Baseline	7.3	4.2	8.4	3	23	34			
2027	Tonnage tax (low)	17.4	10.0	19.9	8	64	82			
2027	Tonnage tax (median)	26.1	11.6	23.0	9	62	95			
2027	Tonnage tax (high)	36.4	22.1	43.9	17	116	181			


FREE SWISS MERCHANT FLEET, 2016-2027 - BASELINE AND TONNAGE TAX SCENARIOS



Appendix 16.2: Oxford Economics (2017). Swiss Shipping Industry Scenario Analysis.

Statistics/Reports «Le pôle économique maritime suisse et la taxe au tonnage» (1/2)

Profile



Title: Le pôle économique maritime suisse et la taxe au tonnage
Publisher: Swiss Shipowners Association
Author: HEC Lausanne
Country: Switzerland
Publication date: 2020

B

Period under consideration
 2020

Focal topic

- Highlights the importance of the maritime economy for the Swiss Confederation
- Expresses urgency for introducing a tonnage tax to strengthen the maritime industry

Key results

- Maritime economy is an important source of dynamism for the Swiss economy as a whole
 - average annual contribution of the maritime industry to Swiss economic growth has been 16% over the last 20 years and 26% in 2014-2018
- Switzerland has become one of the world's leading traders in many products such as coffee, cocoa, sugar, metals, grains and oilseeds, and crude oil
- Tonnage tax as an important factor for the attractiveness of shipping centres
 - already Twenty-one European countries have introduced the tonnage tax, which has become a real standard in maritime taxation
 - Estimation: countries that have introduced tonnage tax, tonnage volumes have increased by an average of 160% in the ten years following its introduction
 - tonnage tax in Switzerland would make it possible to preserve jobs in the industry

Appendix 17.1: HEC Lausanne (2020). Le pôle économique maritime suisse et la taxe au tonnage.

Statistics/Reports «Le pôle économique maritime suisse et la taxe au tonnage» (2/2)

Profile

Title: Le pôle économique maritime suisse et la taxe au tonnage
Publisher: Swiss Shipowners Association
Author: HEC Lausanne
Country: Switzerland
Publication date: 2020

B

Key results

- more than 80% of tonnage is now handled in countries that have introduced a tonnage tax
 - compared to only 20% in 1990, illustrating the gradual adoption of this preferential tax by all countries and economies in the sector

Graphique : Part du tonnage émanant de pays ayant adopté une taxe au tonnage (1990-2019)

Source : calculs de l'auteur à partir de UNCTAD (1990-2019)

- Economic importance of shipping is enormous
 - Also economic dependencies
 - Interaction with a number of complementary sectors:
 - Banking and insurance sector, directly involved in financing trade
 - hedging the associated risks
 - inspection and control companies for goods
- Cluster has approx. 12,000 jobs in Switzerland

Appendix 17.2: HEC Lausanne (2020). Le pôle économique maritime suisse et la taxe au tonnage.

Statistics/Reports «Cargo handling at Swiss Rhine ports 2019» (1/4)

Profile

Title: Cargo handling at Swiss Rhine ports 2019
Publisher: Port of Switzerland
Author: Port of Switzerland
Country: Switzerland
Publication date: 2020

B

Period under consideration
2019

Focal topic

- General classification of vessel types for use on inland waterways based on the goods handled in the Rhine ports

Key results

- General distinction between
 - tankers
 - dry cargo ships
 - Others (pushing boat and lighter/barge)
- Cargo handling, sorted by volume (tonnes) – total tonnage handled 5,054,059 tonnes - **import**
 - Crude oil, petroleum products: 2,756,555 (54.5% of total tonnage handled)
 - Stones, soils and building materials: 789,171 (15.6% of total tonnage handled)
 - Food and feed products: 392,180 (7.8% of total tonnage handled)

Appendix 17.1: Port of Switzerland (2020). Cargo handling at Swiss Rhine ports 2019.

Statistics/Reports «Cargo handling at Swiss Rhine ports 2019» (2/4)

Profile

Title: Cargo handling at Swiss Rhine ports 2019
Publisher: Port of Switzerland
Author: Port of Switzerland
Country: Switzerland
Publication date: 2020

B

Key results

- Cargo handling, sorted by volume (tonnes) – total tonnage handled 1,011,175 tonnes - **export**
 - Stones, soils and building materials: 308,284 (30.5% of total tonnage handled)
 - Chemical products: 125,422 (12.4% of total tonnage handled)
 - Other goods : 122,172 (12.1% of total tonnage handled)

	Schiffsummenung nach Warengruppen in Tonnen						
	Umstieg im Dezember			Umstieg auf Zielvermögen			
	2018	2019	%	2018	2019	%	
0	Leichter/leichtere Einheiten	202'418	199'761	28.4	270'148	130'619	14.1
1	Nachfrage- und Füllbehälter	22'841	17'100	0.5	22'711	10'744	1.2
2	Flüss. energetische Brennstoffe	0	2'808	0.0	344'295	387'490	3.1
3	Erdöl-Mittelverpackungen	1'321'17	227'435	0.4	17'307'826	27'392'525	28.7
4	Eisen- und Metallerzeugnisse	2'752	339	0.0	19'149	31'163	0.3
5	Eisen, Stahl, NE-Metalle	1'768	13'447	0.0	18'914	22'728	0.2
6	Stärke, Getreide, Getreideerzeugnisse	42'000	47'814	0.3	727'918	781'171	7.8
7	Düngemittel	9'008	4'140	0.0	162'127	145'427	1.4
8	Chemische Erzeugnisse	8'908	8'900	0.0	1'897'886	2'091'591	21.2
9	Fertige Maschinen- u. A.	2'282	8'562	0.0	1'879'112	1'879'112	18.9
99	Übrige Güter	8'915	9'204	0.0	1'300'117	1'037'071	10.7
	Gesamt	802'286	887'618	31.7	8'007'258	10'111'175	8.8
0	Leichter/leichtere Einheiten	1'176	2'100	0.0	49'707	81'148	0.4
1	Nachfrage- und Füllbehälter	8'908	8'369	0.0	741'179	723'98	7.2
2	Flüss. energetische Brennstoffe	0	0	0.0	0	0	0.0
3	Erdöl-Mittelverpackungen	1'102	1'100	0.0	87'148	30'117	0.4
4	Eisen- und Metallerzeugnisse	8'908	8'914	0.0	7'149	12'144	0.1
5	Eisen, Stahl, NE-Metalle	8'911	8'911	0.0	87'128	31'176	0.3
6	Stärke, Getreide, Getreideerzeugnisse	17'458	17'458	0.4	243'149	207'981	2.2
7	Düngemittel	0	0	0.0	0	43	0.0
8	Chemische Erzeugnisse	10'781	12'756	0.0	1'300'117	1'037'071	10.7
9	Fertige Maschinen- u. A.	7'841	10'358	0.0	1'207'886	1'207'886	12.1
99	Übrige Güter	8'181	8'438	0.0	1'091'107	1'027'127	10.2
	Gesamt	307'117	402'211	28.8	4'907'181	6'022'214	28.8

Appendix 17.2: Port of Switzerland (2020). Cargo handling at Swiss Rhine ports 2019.

Statistics/Reports «Cargo handling at Ports of Switzerland 2019» (3/4)

Profile



Title: Cargo handling at Swiss Rhine ports 2019

Publisher: Port of Switzerland

Author: Port of Switzerland

Country: Switzerland

Publication date: 2020

B


Key results // Inbound

- Cargo handling, sorted by volume (tonnes) – total volume handled 5,054,059 tonnes
 - Crude oil, petroleum products: 2,756,555 (54,5% of total)
 - Stones, soils and building materials: 789,171 (15,6% of total)
 - Food and feed products: 392,180 (7,8% of total)

Schiffsumschlag nach Warengattung in Tonnen

	Umschlag im Dezember			Umschlag seit Jahresbeginn			
	2018	2019	Δ%	2018	2019	Δ%	
0	Zufuhr	262'418	356'361	35,8	3'768'445	5'054'059	34,1
0	Landwirtschaftliche Erzeugnisse	22'848	10'160	-55,5	220'121	197'564	-10,2
1	Nahrungs- und Futtermittel	23'533	27'129	15,3	384'245	392'180	2,1
2	Feste, mineralische Brennstoffe	0	3'856	0,0	795	18'452	***
3	Erdöl, Mineralölzerzeugnisse	139'017	227'435	63,6	1'736'805	2'756'555	58,7
4	Erze und Metallabfälle	2'725	129	-95,3	19'126	25'143	31,5
5	Eisen, Stahl, NE-Metalle	7'565	13'447	77,7	185'614	227'203	22,4
6	Steine, Erden, Baustoffe	42'020	45'914	9,3	727'678	789'171	8,5
7	Düngemittel	9'806	4'140	-57,8	102'737	145'487	41,6
8	Chemische Erzeugnisse	5'806	6'395	10,1	150'995	258'530	71,2
9	Fahrzeuge, Maschinen, etc.	2'282	8'552	274,8	103'512	107'904	4,2
99	Übrige Güter	6'815	9'204	35,1	136'817	135'870	-0,7

Appendix 18.3: Port of Switzerland (2020). Cargo handling at Swiss Rhine ports 2019.

Statistics/Reports «Cargo handling at Ports of Switzerland 2019» (4/4)

Profile



Title: Cargo handling at Swiss Rhine ports 2019

Publisher: Port of Switzerland

Author: Port of Switzerland

Country: Switzerland

Publication date: 2020

B


Key results // Outbound

- Cargo handling, sorted by volume (tonnes) – total volume handled 1,011,175 tonnes
 - Stones, soils and building materials: 308,284 (30,5% of total)
 - Chemical products: 125,422 (12,4% of total)
 - Other goods : 122,172 (12,1% of total)

	Abfuhr	Umschlag im Dezember			Umschlag seit Jahresbeginn		
		2018	2019	Δ%	2018	2019	Δ%
0	Landwirtschaftliche Erzeugnisse	1'478	2'030	37,3	44'707	51'136	14,4
1	Nahrungs- und Futtermittel	4'909	6'369	29,7	74'179	72'088	-2,8
2	Feste, mineralische Brennstoffe	0	0	0,0	0	0	0,0
3	Erdöl, Mineralölzerzeugnisse	1'532	11'058	621,8	65'168	59'017	-9,4
4	Erze und Metallabfälle	8'488	9'914	16,8	71'643	121'464	69,5
5	Eisen, Stahl, NE-Metalle	4'511	6'101	35,2	58'128	31'376	-46,0
6	Steine, Erden, Baustoffe	14'995	17'458	16,4	242'435	308'284	27,2
7	Düngemittel	0	0	0,0	0	43	0,0
8	Chemische Erzeugnisse	15'761	12'754	-19,1	120'981	125'422	3,7
9	Fahrzeuge, Maschinen, etc.	7'544	10'888	44,3	126'096	120'218	-4,7
99	Übrige Güter	6'081	9'438	55,2	126'197	122'127	-3,2

Appendix 18.4: Port of Switzerland (2020). Cargo handling at Swiss Rhine ports 2019.

Switzerland's dependency on maritime transportation Contribution of high-sea shipping on Swiss import and export supply chains

White Paper

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