

## PLANNED CONCEPT OF CENTRAL AND EXTERNAL PORT AS AN OPPORTUNITY FOR THE DEVELOPMENT OF TRICITY'S SEAPORTS IN POLAND

## KONCEPCJA PORTU CENTRALNEGO I ZEWNĘTRZNEGO JAKO SZANSA NA ROZWÓJ TRÓJMIEJSKICH PORTÓW MORSKICH W POLSCE

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**Abstract:** One of the main determinants of the international status of a seaport is its capacity to handle the largest possible quantities of cargo carried by the largest vessels. A successful seaport is one where trans-shipments are handled by qualified personnel and where excellent facilities are available to ensure that the cargo delivered to the port can be delivered to its destination using the largest possible selection of various modes of transport. A successful seaport should be extended in size to be able to cater for an increasing number of ships at the same time. All these factors can help make seaports more competitive. The largest of Poland's seaports, namely the Port of Gdańsk and the Port of Gdynia, are trying to reach the status of being ranked among Europe's best ports. This goal can only be achieved through new ideas and new investment projects. Two projects are planned as a way to stimulate the development of Poland's seaports: the Central Port at the Port of Gdańsk and the External Port at the Port of Gdynia. These projects will help strengthen the position of Tricity's seaports in the international arena.

**Keywords:** Port of Gdańsk, Port of Gdynia, ferry crossings, global market, trans-shipments.

**Streszczenie:** Jedną z głównych cech determinujących pozycję portu na arenie międzynarodowej są jego parametry umożliwiające przeładunek jak największej ilości ładunków przewożonych przez jak największe jednostki pływające. Największe z polskich portów – Gdańsk i Gdynia – walczą o status jednych z najlepszych w Europie. Aby osiągnąć ten cel, każdy z portów wymaga nowych koncepcji, co prowadzi do szeregu inwestycji. Powstały dwa projekty umożliwiające portom rozwój. W porcie gdańskim powstanie Port Centralny, natomiast w Gdyni – Port Zewnętrzny. Zrealizowanie tych projektów wzmocni pozycję portów trójmiejskich na arenie międzynarodowej.

**Słowa kluczowe:** Port Gdańsk, Port Gdynia, infrastruktura portowa, ruch statków, konteneryzacja.

## **1. DETERMINANTS OF THE COMPETITIVENESS OF SEAPORTS**

There is a wide variety of the factors taken into account by the carriers when selecting a port of calls. Among the most important features, potential customers and other businesses will look at the benefits offered by the location of the port and its possible development. The availability of infrastructure for delivering shipments to their destinations safely and on time is essential. The more modes of transport a seaport location offers, the more competitive it is. Modern infrastructure for access by land, i.e. rail and road, helps eliminate traffic congestions. Together with reasonable connections to national transport networks, these are extremely important determinants of the competitiveness of seaports. If a port is to operate ocean-going ships, the right number of trans-shipment terminals and a large enough wharf area are required. The appropriate space can be provided by constructing external ports that make use of new port areas, as the perfect alternative to lack of space on land.

## **2. PRESENT SITUATION OF THE PORT OF GDAŃSK**

The Port of Gdańsk is growing and handles more and more trans-shipments every year. In 2017, the Port of Gdańsk handled 46% of overall goods handling in main transshipment Polish ports. It is also implementing innovative solutions and developing new ones, thus becoming one of the most efficient seaports in the Baltic Sea. Compared to other ports in Poland, it is one of the most advanced transport links. It has the capacity to accommodate ships with a draught of up to 15 metres and a length overall of up to 300 metres, which means that it can handle ocean-going vessels. Land deliveries of cargo to and from the port are efficient, since the port has modern infrastructure that allows heavy - weight vehicles to bypass the centres of large cities, such as Gdańsk, to reach the port. This infrastructure includes the tunnel under the Martwa Wisła River and an express road that joins the A1 national motorway, which is the main transport axis connecting the north and the south of Poland. There is a well-developed railway network, modernised in 2016 to take cargo from the Port of Gdańsk to other parts of the country. Also, a new railway bridge was built that allows trains to reach the deep-water part of the port. The construction of the bridge increased the port's rail transport capacity sixfold - 180 pairs of trains use the bridge in each 24-hour period [Port of Gdańsk Authority 2018]. This railway network contributes to the development of intermodal transport, as seaports are a major source of cargo flows.

The central European location of Poland means the Port of Gdańsk is becoming an attractive port for the Russian market as well as the Lithuanian, Latvian, Estonian, Finnish and German markets. Another benefit of the central location of Poland is the connection of the Port of Gdańsk to the core ports of the Trans-

European Transport Network (TEN-T) and the fact that the port is recognised as the beginning of Core Network Corridor 1, which runs from the Baltic Sea to the Adriatic Sea [Salomon 2013].

The Port of Gdańsk operates a variety of cargo. Estimates published by the Port of Gdańsk indicate that Gdańsk's catchment area is at least 100 million consumers who export and import their goods by sea [Brancewicz 2015]. This fast growth of trans-shipment volumes and business relationships between international businesses and the Port of Gdańsk means that it is necessary to design a project to expand the area of the port, including its infrastructure, to enable the port to handle more ships. The project called The Central Port is the solution that will help make use of the potential offered by the Port of Gdańsk.

### **3. THE CENTRAL PORT OF GDAŃSK**

The construction of the Central Port will be a milestone on the way to the Port of Gdańsk's increased throughput capacity and an effective increase of Poland's economy. The plan includes the construction of a passenger terminal prepared to handle 2 million passengers a year, a terminal for cruise ships, ro-ro vessels, and a terminal for chemical tankers (today the Port of Gdańsk has no such terminal). Also, the port's shipbuilding facilities will be expanded. The proposed location of the planned terminals is shown in Figure 1, indicating the planned arrangement of trans-shipment areas for the different terminals. The current location of the adjacent Outer Port will make it possible to use the existing access infrastructure and all the necessary utilities, such as the power supply system, the water supply, sewage system and ICT networks. This will reduce the cost of the project, as utility civilian engineering will only have to be extended to the locations of different terminals [Brancewicz 2015].

The expansion of the Port of Gdańsk out to the sea, beyond its administrative borders, is in accordance with the "Development Strategy of the Port of Gdańsk until 2027", which plans to increase the capacity of the port's existing trans-shipment terminals and the construction of new such terminals, to prevent ships from queuing at anchor before entry to the port. This project is scheduled to be completed by 2028, and its estimated cost at between PLN 6 billion and PLN 9 billion [Port of Gdynia Authority 2018]. The largest part of the project is to be carried out by private companies, which means higher profits and reduced capital expenditure for the Port of Gdańsk.

Estimates show that with the current upward trend in trans-shipment volumes, the Port of Gdańsk may, in ten years from now, have to face the challenge of handling one hundred million tonnes of cargo annually. In such a case, the Central Port offers the ideal solution and response to the increasing number of seagoing vessels arriving at the Port of Gdańsk. Also, the port's ship turnaround handling

time will be reduced significantly, as will the time ships have to wait at anchor to enter the port. Customers will save the time they now waste when their ships are faced with congestions before entering the port. An invitation to tender has already been issued to find a company to design a proposal for the development of the Central Port at the Port of Gdańsk. The new project is to be located on approx. 500 hectares of reclaimed land [Port of Gdańsk Authority 2018]. The project process is to be based on the Build–operate–transfer (BOT) approach. This is an approach whereby the terminals would be constructed by a public body entity or a private company. Subsequently, the entity that constructed the terminals would operate them and retain the proceeds until the project breaks even and becomes operating at a profit, in accordance with the agreement between that entity and the Port of Gdańsk. Later, after a fixed period of time, the facilities would be transferred for free to the Port of Gdańsk Authority [Brancewicz 2015].



**Fig. 1.** Proposed location(s) of the planned terminals

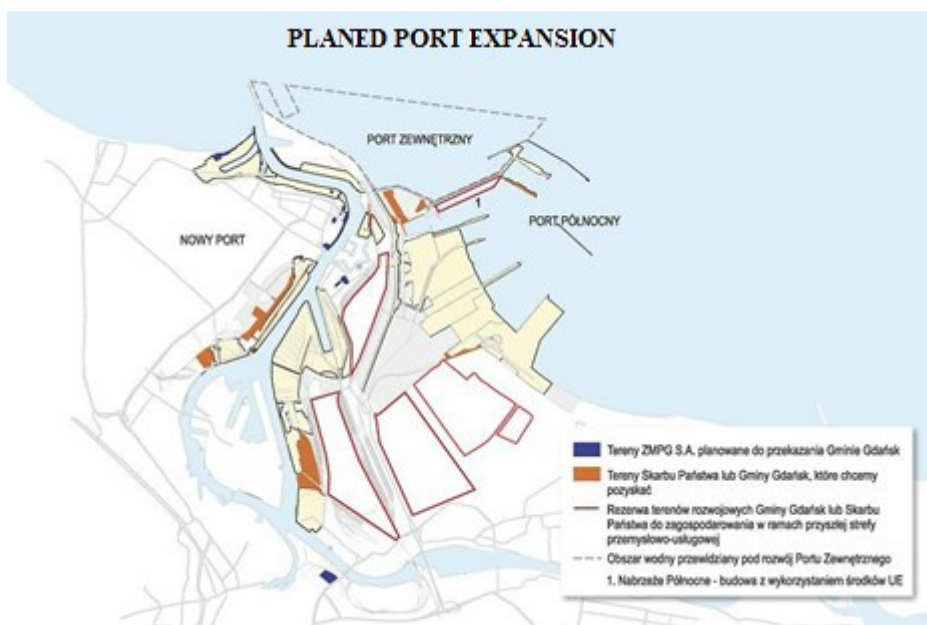
**Rys. 1.** Koncepcja przestrzennego ułożenia przyszłych terminali

Source: [Port of Gdańsk Authority 2018].

When the technical designs are prepared and the necessary seabed tests and environmental assessment are completed, the final designs for an application for a building permit for the project will be prepared as the basis for the commencement of the largest seaport project so far. The conceptual technical design stage is essential and must be the first step in the process. It will set the guidelines for the preparation of the designs for building permit purposes, which normally include details of any obstacles to the project, as well as information on

hydrological and environmental conditions and, importantly, details on how the newly constructed road infrastructure would be connected with the existing road or rail infrastructure. The technical designs will set a time framework for the project and will divide the construction process into stages, as the funding will also be divided into stages. Moreover, the construction process will reflect trends in trade in goods and trends in the use of sea transport. The first terminals will be completed as soon as in 6 years' time, i.e. in 2024, which means that the Port of Gdańsk will undergo intensive development in the near future.

The location of the Central Port is very favourable. The word "Central" means that the port will be located in the central part of the Port of Gdańsk. It includes a part of the Bay of Gdańsk, which is to become reclaimed artificial land in the future. The Central Port will cover the area from the Eastern Breakwater to the Northern Island Breakwater; more precisely, the area between the mouth of the Port Canal and the existing Fuel Base [Brancewicz 2015]. As regards the expansion of the port out to the sea, all the terminals and port infrastructure would be expanded for approx. 2 km out into the Bay of Gdańsk. This plan for the project means that ZMPG S.A. (Port of Gdańsk Authority) would transfer to the City of Gdańsk 120 hectares of its land, now the left-bank side part of the Inner Port, for urban development projects. The above plan is shown in Figure 2.



**Fig. 2.** The plan for the spatial development of the Port of Gdańsk

**Rys. 2.** Kierunki przestrzennego rozwoju portu w Gdańsku

Source: [Port of Gdańsk Authority 2018].

Sea transport is crucial for the development of business relations with China, which was once described as a country located centrally in relation to “four seas”. Nowadays China is still a major business partner, and the revenue from handling cargo brought by ships from China is a significant part of the income of Tricity's seaports and, consequently, of the Polish State Treasury. The construction of the Central Port will provide opportunities for intensifying these relations and establishing new ones with other countries of the Eastern World [Port of Gdańsk Authority 2018].

The deep-water terminals at the Central Port will be designed to cater for the largest ships entering the Baltic Sea. The main exports to China are still copper and copper products. Exports of electrical machinery and equipment, recorders, sound and picture players, as well as non-rail vehicles and parts for such vehicles have increased significantly [Borkowski 2018]. As regards road vehicles, the construction of the aforementioned ro-ro terminal will be very important, as this would further increase exports of non-rail vehicles, once they can be reloaded, loaded and transported professionally. The first terminal for chemical tankers will enable the port to offer services in this area as well. In 2016, Poland's exports of dairy products to China amounted to approx. PLN 35.5 million. This shows that countries of the Eastern World readily establish business relations with Central Europe, which offers a real opportunity for such relations to develop. However, this will only be possible if a sufficient number of terminals and unloading areas are provided, and these can be provided by the Central Port project. Additionally, the various terminals and modern infrastructure at the new port may become an alternative to West European ports. Benefits will also include the capacity to offer services to customers from the Czech Republic, Slovakia and the northern part of Ukraine [Borkowski 2018]. The Central Port may practically double the port's trans-shipment capacity, which will significantly strengthen the position of the Port of Gdańsk internationally, particularly among the ports of the Baltic Sea region. Additionally, the port's impact on Eastern and Central European markets, including the Czech Republic, Slovakia and Hungary, as well as the western parts of Ukraine and Belarus, will increase.

There is more to the development of the Port of Gdańsk than higher turnover for Poland's seaports: the project would also attract investors and both Polish and international businesses to Poland so that they could be as close as possible to the seaports they can use to ship their goods to other countries or continents. The Sea-Invest Group, the trans-shipment leader in Africa and Western Europe, has constructed, within the Port of Gdańsk, a dry bulk cargo terminal with annual throughput capacity of approx. 600 million tonnes.

The Port of Gdańsk's business relationships with Maersk, the shipping operator with the largest fleet, and Mediterranean Shipping Company, which is the second largest operator (both these companies are part of the alliance called 2M), have been successful. This encourages the Port of Gdańsk to go ahead with the

Central Port project to be able to cater for even more 2M ships and to provide the two companies with services according to high quality standards. Since 2015, these two operators have been joined at the Port of Gdańsk by other shipping companies, such as OOCL, Hapag Lloyd and NYK Line. If they continue to use the services of the Port of Gdańsk, Poland's seaports will have a chance to go global [Brancewicz 2015].

The Central Port project provides an opportunity for the Port of Gdańsk to become one of the largest ports in the European Union, based on the potential of the port's infrastructure and the different trans-shipment terminals for handling dry and liquid bulk cargo, unitised cargo, as well as containers. This would make the Port of Gdańsk a versatile seaport, which is crucial if the port is to connect an essential part of Europe with global markets and, particularly, if it is to become a major distribution port in the Baltic Sea region [Brancewicz 2015].

Another benefit of the expansion of the Port of Gdańsk is the designation of a Duty Free Zone, i.e. a sectioned-off area where companies will be able to pursue their business activities based on specific customs and tax regulations. These activities will include the storage, manufacture and processing of products, plus the sale, storage and packaging of finished goods, as well as the consolidation and deconsolidation of goods intended for the global market. The Duty Free Zone would significantly facilitate trade with countries in all parts of the world, as no trade licences or permits would be required, no customs duties or taxes would apply to goods imported into the free zone until they are taken from the storage place and shipped to a location in the European Union's customs area. Moreover, a pro-forma invoice would be sufficient to introduce goods into the DFZ and no specific dates would be fixed by which the goods must leave the storage location within the zone. Businesses interested in storing their goods in the DFZ would not have to be registered in Poland [Brancewicz 2015].

#### **4. PORT OF GDYNIA**

The Port of Gdynia still remains somehow in the Port of Gdańsk's shadow. In 2017, the Port of Gdynia had a 24% share in the main trans-shipment ports, which is 20% less than the Port of Gdańsk's share. Similarly to the Port of Gdańsk, the cargo handled by the Port of Gdynia is predominantly general cargo, with more than 10 million tonnes handled annually, accounting for 59% of the port's turnover [Borkowski 2018]. This type of cargo is followed by grain and animal feeding stuffs.

The Port of Gdynia is the largest transshipper of such cargo among all Polish seaports. Also, a large share of the port's traffic is attributable to services for passenger ships sailing between Gdynia and Karlskrona (Sweden). The latest project at the Port of Gdynia, namely the construction of a larger turning basin for ships of up to 366 metres long (LOA) and 50 metres wide (BOA), will allow the

port to cater for much larger ships. Another project is the deepening of the entrance channel and docks. These projects will make the Port of Gdynia more competitive in relation to other European seaports [Kaizer et al. 2017].

The situation of access infrastructure at the Port of Gdynia is more complicated than that at the Port of Gdańsk, as the former is situated in the centre of the city. The traffic capacity of the roads leading to national railway network is low. Traffic congestions are frequent on the roads for heavy-goods vehicles, as all of them use the Kwiatkowski Flyover. The problems related to this port's infrastructure can only be addressed by modernising the railway line, which is scheduled for 2020, and building a new road connection to the port (called 'Red Road') to reduce traffic congestions [Kaizer and Smolarek 2015].

## **5. AN EXTERNAL PORT AT THE PORT OF GDYNIA**

Port of Gdynia Authority plans to build an external port at the Port of Gdynia. This would make Tricity's ports more competitive compared to other seaports in the Baltic Sea region and other European countries. Faced with the lack of space, the Port of Gdynia has made the decision to construct a deep-water external port. This project would provide the same benefits as those offered by the Central Port, i.e. increased competitiveness and improved access to the port from the sea. Based on the Regulation of the Minister of Infrastructure and Development of 13 November 2015, the area of the Port of Gdynia was expanded beyond the port's existing breakwater. The Ministry expects the project to be completed in 3 years' time. Two years later, the new external port would handle the first trans-shipments. The development of these areas forms part of the "Programme Project for the Development of Polish Seaports by 2020 (with perspectives to 2030)".

The External Port would be based on the existing quays (Silesian Quay and Swedish Quay) and the exits out to the sea, which is illustrated in Figure 3. The project would make it possible to increase the number of container trans-shipments handled by the port and to use the port's facilities to cater for bulk carriers. Moreover, the alteration of the port's access infrastructure would allow larger passenger-carrying vessels to enter Basin 1 and Basin 2 [Kaizer and Smolarek 2015; Port of Gdynia Authority 2018a,b]. In addition to an increase in the number of trans-shipments and ships at the port, which would create opportunities for Poland's seaports to welcome ocean-going ships, other sectors of the Polish economy would benefit as well. A larger seaport means more jobs and more excise-duty and customs revenue for the government on the goods crossing the European Union's border in Poland. These are considerable profits as in 2016 alone, the excise-duty and customs payments made to Tricity's seaports amounted to approx. PLN 14 billion.



The construction of the External Port may be the only solution to address the Port of Gdynia's problem with the lack of space, as the port is already surrounded by developed land. In the past, the Port of Gdynia was a 'giant' among other seaports and it stands a good chance of regaining this status by expanding its facilities out to the sea. The start of the project is part of a new history of the Port of Gdynia.



*Fig. 3. Concept proposal for an external port at the Port of Gdynia*

**Rys. 3.** Koncepcja Portu Zewnętrznego w Porcie Gdynia

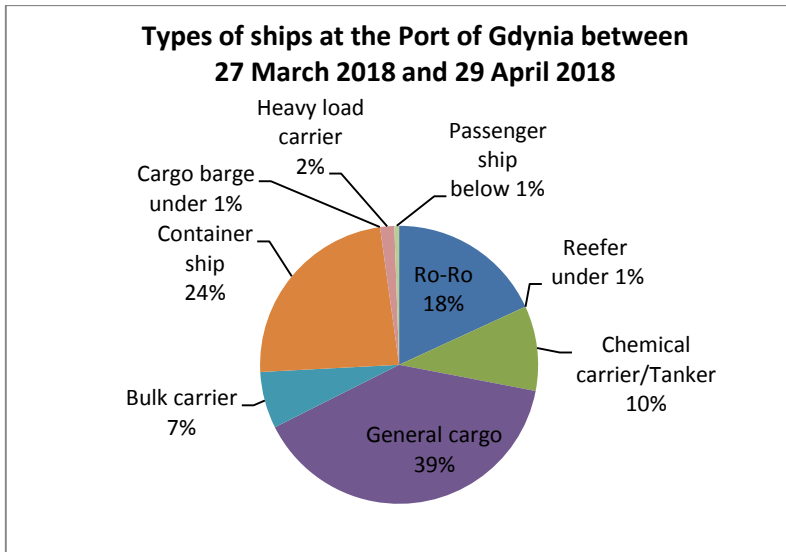
*Source: [Borkowski 2018].*

## **6. ANALYSIS OF THE NUMBER OF SHIPS AT TRICITY'S SEAPORTS**

It is important to analyse both the number of ships calling at Tricity's ports and the countries where these ships come from. For the analysis to be relevant, it should also cover the tonnage, lengths and widths of the ships. The analysis period covered 30 days, from 27 March 2018 to 28 April 2018, for both the Port of Gdynia and the Port of Gdańsk [Gdynia Maritime Office 2018; Marine Traffic Services 2018].

### **6.1. Port of Gdynia**

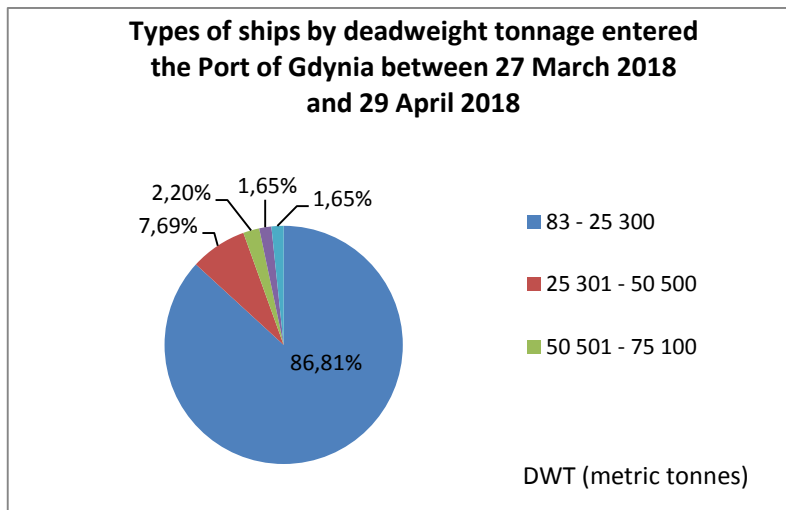
The following pie chart shows the types of ships that entered the Port of Gdynia during the analysed period, i.e. between 27 March 2018 and 29 April 2018. Most of the ships are unitised cargo (general cargo) ships, followed by container ships and ro-ro ships. This is a result of the infrastructure of the port and the cargo it handles. The analysis does not include Stena-Line ships, which call at Gdynia on a daily basis (Fig. 4).



**Fig. 4.** Types of ships that entered the Port of Gdynia between 27 March 2018 and 29 April 2018

**Rys. 4.** Typy statków wpływających do Portu Gdynia w dniach od 27 marca 2018 r. do 28 kwietnia 2018 r.

Source: own study.

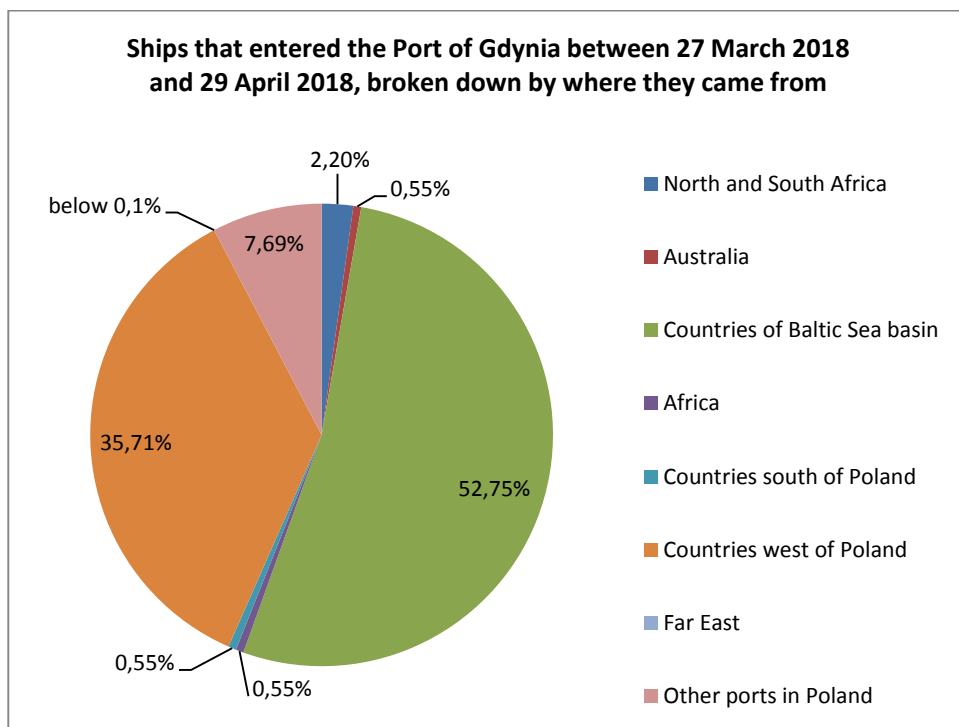


**Fig. 5.** Deadweight tonnage ranges of the ships that entered the Port of Gdynia between 27 March 2018 and 29 April 2018

**Rys. 5.** Przedziały nośności statków przybywających do portu Gdynia w dniach od 27 marca 2018 r. do 28 kwietnia 2018 r.

Source: own study.

The above pie chart shows the carrying capacity ranges of the ships that entered the Port of Gdynia during the analysed period (Fig. 5). Majority of the ships had carrying capacities ranging from 83 to 25.300. The other carrying capacity ranges were not represented by many ships. The ships docking at Gdynia are of rather low carrying capacity, although the Port of Gdynia is prepared to handle larger vessels. The Port of Gdynia does not stand out when compared to major European ports, where ships such as Panamax are a normal sight. Perhaps the construction of the External Port will attract much larger vessels to the Port of Gdynia, as the largest ship that entered the port had a carrying capacity of 117.549.



**Fig. 6.** Ships that entered the Port of Gdynia between 27 March 2018 and 29 April 2018, broken down by where they came from

**Rys. 6.** Ostatnie cumowania statków przyływających do portu Gdynia w dniach od 27 marca 2018 r. do 28 kwietnia 2018 r.

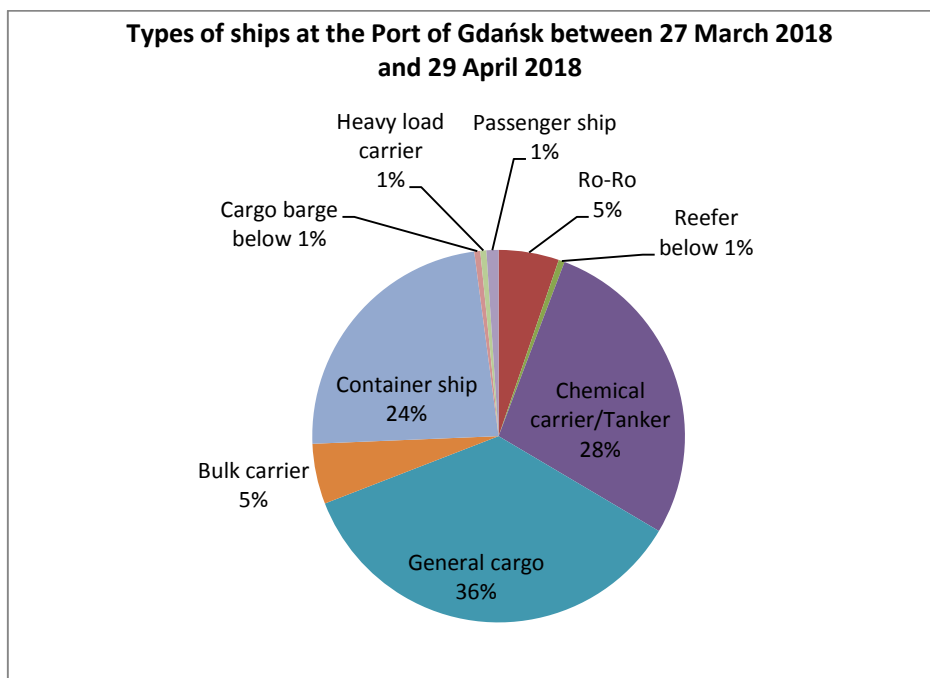
Source: own study.

The above chart shows the ships that entered the Port of Gdynia, broken down by where they came from (Fig. 6). Most of the ships came from the Baltic countries, as well as from the countries to the west of Poland. The cargo handled by the Port of Gdynia is brought by ships coming mainly from Poland's neighbouring countries. The percentage of ships from other continents is small.

## 6.2. Port of Gdańsk

At the Port of Gdańsk, as well, general cargo ships were the predominant type of ships that entered the port. These are followed by chemical carriers/tankers and container ships. Ro-ro ships accounted for 5% of all the ships, as did bulk carriers. Passenger ships were the smallest group. In fact, only one such ship called at Gdańsk during the analysis period.

Figure 7 shows a breakdown of the types of ships at the Port of Gdańsk.



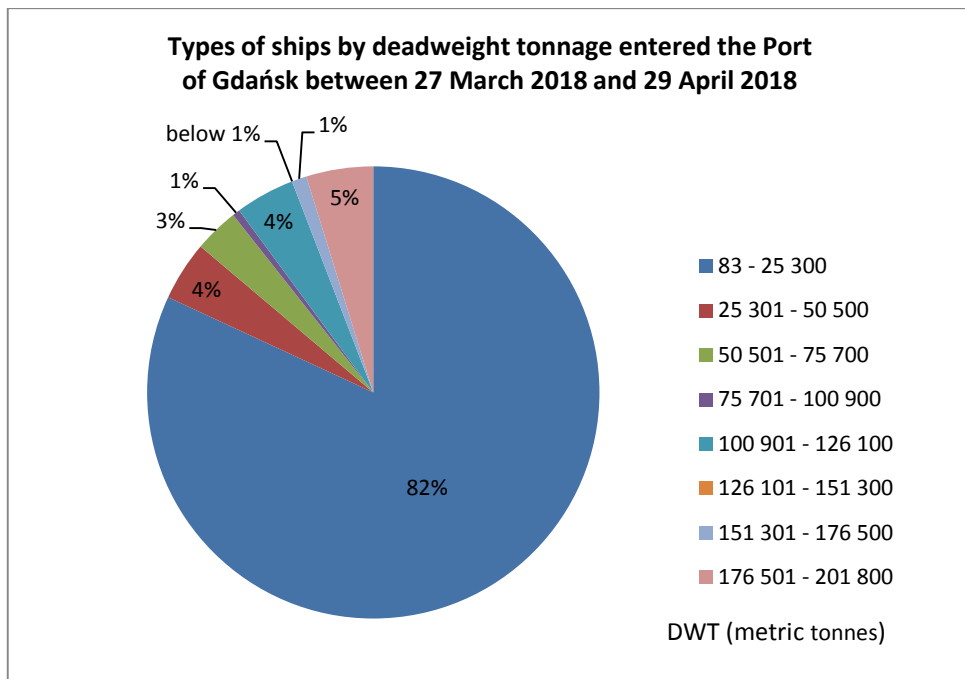
**Fig. 7.** Types of ships that entered the Port of Gdańsk between 27 March 2018 and 29 April 2018

**Rys. 7.** Typy statków wpływających do Portu Gdańsk w dniach od 27 marca 2018 r. do 28 kwietnia 2018 r.

Source: own study.

The following chart shows the carrying capacity ranges of the ships that entered the Port of Gdańsk during the analysis period. The largest number of the ships are, similarly to the Port of Gdynia, vessels within the 80–25.300 range.

The largest ship that docked at Gdańsk had a carrying capacity of 201.792, and the smallest ship at Gdańsk had a carrying capacity of 83. Compared to the Port of Gdynia, Gdańsk handled more ships that meet the criteria for being regarded as ocean-going vessels, as well as ships operated by shipping alliances such as Maersk Line, MSC and OOCL, whose ships sail to the world's largest ports.



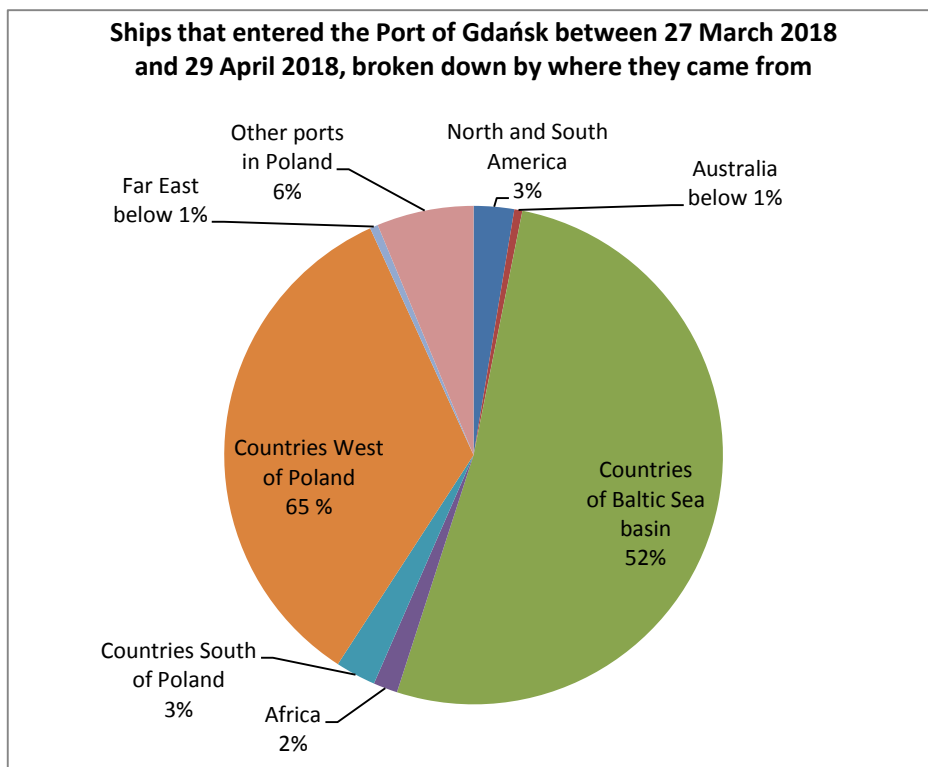
**Fig. 8.** Deadweight tonnage ranges of the ships that entered the Port of Gdańsk between 27 March 2018 and 29 April 2018

**Rys. 8.** Przedziały nośności statków przybywających do portu Gdynia w dniach od 27 marca 2018 r. do 28 kwietnia 2018 r.

Source: own study.

Most of the ships at the Port of Gdańsk during the analysis period came from Sweden and Denmark (Fig. 9). The Port of Gdańsk handled more ships from America and one ship directly from the Far East. Unlike at the Port of Gdynia, there were also individual cases of ships from Morocco, Israel or even Ecuador at Gdańsk.

It is clear from the above charts that the global market is not yet wide open for the Port of Gdańsk or the Port of Gdynia. Most of the ships that dock at Gdańsk and Gdynia come from European ports, particularly from Scandinavian countries. Perhaps the Central Port project, once completed, will improve the situation and attract more ocean-going vessels to Tricity's ports. The expansion of the ports' areas may be the best way to increase the turnover of Tricity's ports.



**Fig. 9.** Ships that entered the Port of Gdańsk between 27 March 2018 and 29 April 2018, broken down by where they came from

**Rys. 9.** Ostatnie cumowania statków przybywających do portu Gdańsk w dniach od 27 marca 2018 r. do 28 kwietnia 2018 r.

Source: own study.

## 7. CONCLUSIONS

Maritime transport is a global business, as it connects continents divided by seas and oceans. It is also a direct contributor to global trade volumes. The use of maritime transport allows businesses to take advantage of the economies of scale, as ships can carry cargo at long distances and seaports are the gateways to the world's major industrial centres [Pluciński 2013].

Transport and economic growth are interrelated in many ways. However, these interrelations are complicated due to their influence and because the impact of an investment project based in a specific location extends to areas near that location only. The geographical impact of seaports is significant and often covers the entire area of the country where they are located or even its neighbours [Kaizer

and Smolarek 2016]. The advances of technology necessitate the development of transport infrastructure and improvement in the efficiency of transport services. What is important for the Port of Gdańsk and the Port of Gdynia is the expansion of their port areas in order to be able to cater for more ships, particularly ocean-going vessels. As both ports are located in the European north-south corridors, Gdynia and Gdańsk could successfully be regarded as the start or end hubs for marine transport routes and as logistics centres [Kozłak 2012; Salomon 2013].

The most important action, with the effect of improved competitiveness of the aforementioned seaports, is increasing the efficiency and quality of their services and the creation of added value. This will make the two locations modern seaports that will be able to expand the range of services offered and attract more ship operators. The Central Port project at the Port of Gdańsk and the External Port project at the Port of Gdynia will certainly contribute to the achievement of these goals.

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