

AUSSEN WIRTSCHAFT INDUSTRY REPORT NETHERLANDS

SEAPORT INFRASTRUCTURE

THE PORT OF ROTTERDAM AS EUROPE'S LARGEST PORT
KEY FACTS & FIGURES
PORT INFRASTRUCTURE
VALUE ADDED, EMPLOYMENT AND INVESTMENTS
SUSTAINABILITY, INNOVATION AND TRENDS

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1. THE PORT OF ROTTERDAM AS EUROPE'S LARGEST PORT

1.1 Introduction and brief history

The port of Rotterdam is the largest seaport in Europe, located in and near the city of Rotterdam, in the province of South Holland in the Netherlands. Measured in annual cargo tonnage, the port of Rotterdam was the largest port in the world from 1962 until 2004. From 2005 on, the top ranks in the top-10 of largest seaports were taken by Singapore and other very large Chinese ports.

The port is managed by the 'Port of Rotterdam Authority' ('Havenbedrijf Rotterdam N.V.'). The municipality of Rotterdam and the Dutch State are the two shareholders ($\pm 70\%$ for the municipality and $\pm 30\%$ for the Dutch State). Port of Rotterdam Authority is an unlisted public limited company with approximately 1,270 employees and a yearly turnover of ± 770 million Euro¹. In 2021, the operating result before interest, depreciation and taxes amounted to 512.2 million Euro.

The first written mention of the port of Rotterdam was in 1283 when a tract of reclaimed land was created at the mouth of the Rotte River as a fishing village. The port became a major seaport in 1360 after the construction of a canal to the Schie. This new canal gave the port of Rotterdam access to larger cities in the north, and it became an important centre for the trade of goods between England and Germany. After the discovery of the sea route to the Indies in the 17th century, the Dutch commerce and shipping boomed. The port of Rotterdam was expanded along the Meuse, and before 1700, the port of Rotterdam was the second most important port in the country (after Amsterdam). It became one of the Dutch East India Company's centres in the Netherlands.

Some important events and milestones in the history of the port of Rotterdam:

1795-1815: Napoleonic Wars, French occupation: the port of Rotterdam had little trade. After Napoleon fell, trade returned to the port of Rotterdam.

1866-1872: The 'Nieuwe Waterweg' ('New Waterway') was built, because during the 19th century, Rotterdam became less accessible due to the silting up of the mouth of the Brielse Maas. The new canal connected the port of Rotterdam directly to the sea.

1872 and after: building of several docks² in the IJsselmonde area with, among others, the Rijnhaven, de Maashaven en de Waalhaven. In 1929 the 'Eerste Petroleumhaven' was built, where a very important petroleum industry is still located today (Red in figure 1, see next page).

1900-1930: Several docks were built in the Rotterdam-West area, for the trade of general cargo. After 1950 this area became less important.

1947 and after (dark blue in figure 1): development of the Botlek-area, located West of the river 'Oude Maas'. Industrial activity, in particular the petrochemical industry, predominates in this area.

1958 and after (light blue in figure 1): development of the Europoort area, which was accessible to the largest seagoing vessels. The Europoort area is focused almost exclusively on the transshipment and processing of petroleum and (in the western part) the transshipment of grain and ore.

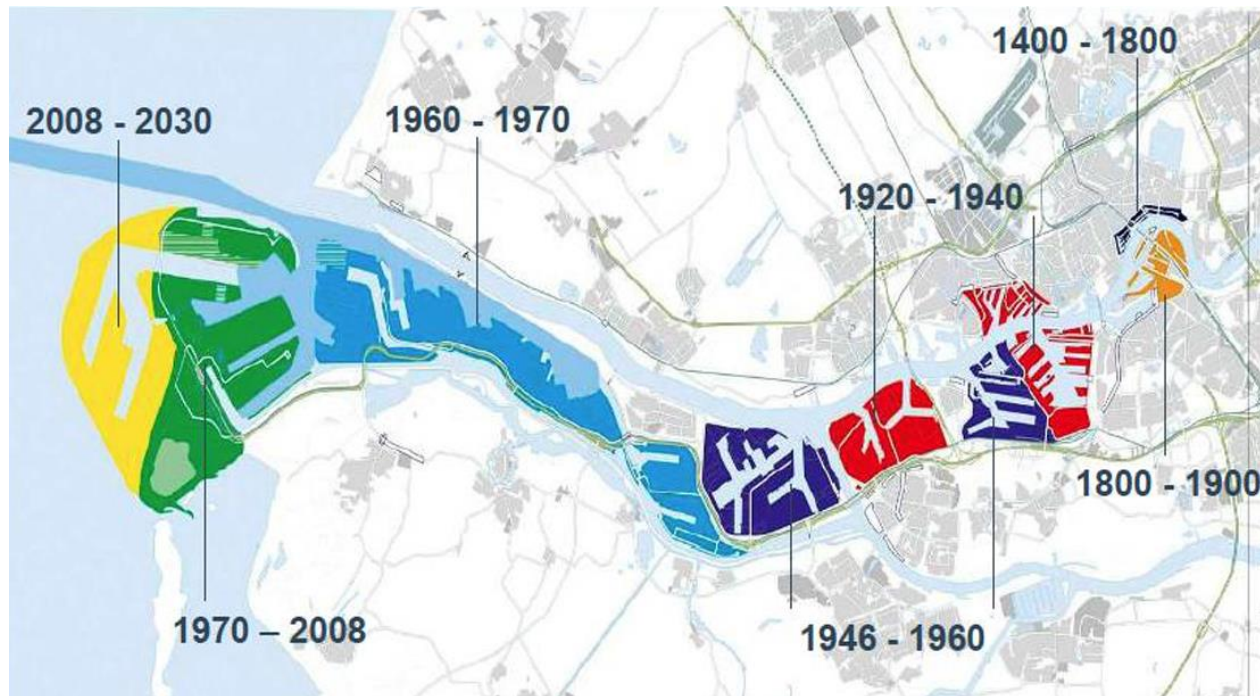
1970 and after (green in figure 1): development of the Maasvlakte area. In 1973 the first ship moored in the Maasvlakte, a large industrial area located close to the sea. The area was originally only intended for large-scale activities, such as storage and transshipment of oil, dry bulk and gas, whereby deep-draft ships were used for

¹ Source: Port of Rotterdam Authority

² In the port of Rotterdam, the docks are called 'ports', which is why all the names of the docks end with '-haven'.

transport. Only later container transshipment was added. At the beginning of the 21st century, it was decided to further expand the Maasvlakte for container transshipment and industrial activities. This new area, officially inaugurated in 2013, is referred to as 'Maasvlakte 2' (yellow in figure 1). (This will be discussed in more detail later in this report).

Figure 1: Development of the port of Rotterdam



Source: M. van Schuylenburg, Rotterdam Workshop, 24 March 2010, found in: OECD, 2010, 'Transcontinental infrastructure needs to 2030 / 2050 North-West Europe gateway area - port of Rotterdam case study - Rotterdam workshop - final report'.

1.2 Most important goods and industrial activities

The port of Rotterdam is important in the area of transshipment of containers and bulk goods, such as petroleum, chemicals, coal and ores. Liquid bulk accounted for more than half of this, and dry bulk a sixth. Container transshipment makes up almost a third of the total.

Like the port of Amsterdam, the port of Rotterdam is one of the two largest petroleum and coal ports in Europe. Coal ships come from Colombia, the United States, South Africa and Russia, with 90% of the coal being shipped to Germany. In 2021, the demand for coal has risen sharply due to the high gas price, enabling the coal-fired power plants to compete better with their gas-fired counterparts. German steel production picked up sharply in 2021, also leading to larger incoming volumes of iron ore, scrap metal and coal.

Crude oil is imported from, among others, Russia³, Norway, Saudi Arabia, the United Kingdom and Nigeria. In 2021, the total throughput of crude oil in the port of Rotterdam amounted to 98.2 million tons. The largest part of this crude oil is for the five oil refineries in the port of Rotterdam: Shell Nederland, ExxonMobil, Vitol, BP and Gunvor Petroleum Rotterdam. Another five refineries in the Netherlands, Belgium and Germany are supplied with (crude) oil via pipelines from the port of Rotterdam. The port of Rotterdam offers the advantage that even

³ 15%, i.e. 62 million tons of the almost 470 million transshipment in the port of Rotterdam, is Russia-oriented. Via the port of Rotterdam, many energy carriers are imported from Russia. Broadly speaking, at present 20% of the coal comes from Russia, 20% of the oil products, 25% of the LNG and 30% of the crude oil (Source: Port of Rotterdam).

the largest oil tankers can enter the port and load and unload at the oil terminals in a single visit. Together with the refineries of Total/Lukoil in Vlissingen (Netherlands), Shell in Godorf (Germany), BP/Rosneft in Gelsenkirchen (Germany) and Total and ExxonMobil in Antwerp (Belgium), the port of Rotterdam makes up one of the three largest fuel hubs in the world.

In 2021, the transshipment of containers in the port of Rotterdam amounted to 154.5 million tons (15.3 million TEU⁴). This made the port of Rotterdam the largest in Europe in terms of containers. Since the merger of the ports of Antwerp and Zeebrugge to form the port of Antwerp-Bruges, this merged port has become the largest in terms of container transshipment, expressed in tons (159.0 million tons, 14.2 million TEU). Expressed in TEU, Rotterdam is still the largest.

1.3 Rotterdam in relation to other Dutch ports

The Netherlands has more than 20 ports, but the difference in scale is large. The three most important ports are Rotterdam, Amsterdam and North Sea Port (which is a half Dutch/half Belgian port).

Table 1: Most important ports in the Netherlands

Name	Location	Tons 2021 (million tons)	Most important goods
Port of Rotterdam	North Sea coast	468.7	Containers and bulk goods (petroleum, chemicals, coal and ores)
Port of Amsterdam	At the junction of the North Sea Canal and the Amsterdam Rhine Canal	88.9	Solid fuels, crude oil, refined products, foods, crude and manufactured minerals
North Sea Port	Merged port with ports in Vlissingen and Terneuzen (Province of Zeeland, the Netherlands) and Ghent (Province of East-Flanders, Belgium)	68.9 (Ghent: 31.5, Vlissingen & Terneuzen: 37.4)	Dry bulk (iron ore, coal), chemicals, roll-on roll-off, general cargo, cars
Groningen Seaports	Along the river Ems, in the province of Groningen	10	Minerals, such as salt, limestone and sand and oil products and chemicals
Port of Moerdijk	Southern end of the Hollandsch Diep, on the Rhine-Scheldt Canal	7.3	Containers, chemical and heavy industry. Most important company is Shell Chemicals
Port of Harlingen	Northwestern coast of the Netherlands bordering the Waddenzee	2	Sand, gravel, fishing vessels, recreation, river cruises
Port of Scheveningen	Western coast of the Netherlands, about 20 kilometres from the Hook of Holland	1	Recreation (marina), mooring place for naval and passenger ships (cruises) and fishing vessels

Source: composition based on various websites (port authorities and others)

1.4 Management and responsibility of the port authority

⁴ TEU = 'Twenty foot Equivalent Units'. One 20 Foot container = 1 TEU, one 40 Foot container = 2 TEU.

Corporate and social responsibility of port authorities

The Port of Rotterdam Authority fulfils all the criteria concerning corporate and social responsibility (criteria from European Sea Ports Organisation (ESPO) Port Performance Dashboard):

- The Port Authority (PA) holds an Annual Meeting
- The Annual Report of the PA is publicly available
- The PA holds regular meetings with the port community and stakeholders
- The PA publishes reports on socially responsible initiatives
- The PA publishes financial reports
- The PA's specific mission statement is publicly available
- The PA maintains financial accounts audited by external auditor(s)
- The PA has internal analytical accounting processes
- The PA uses public selection procedures to contract land

Autonomous management

The port of Rotterdam authority is managed autonomously. It fulfils the following criteria from the ESPO Port Performance Dashboard:

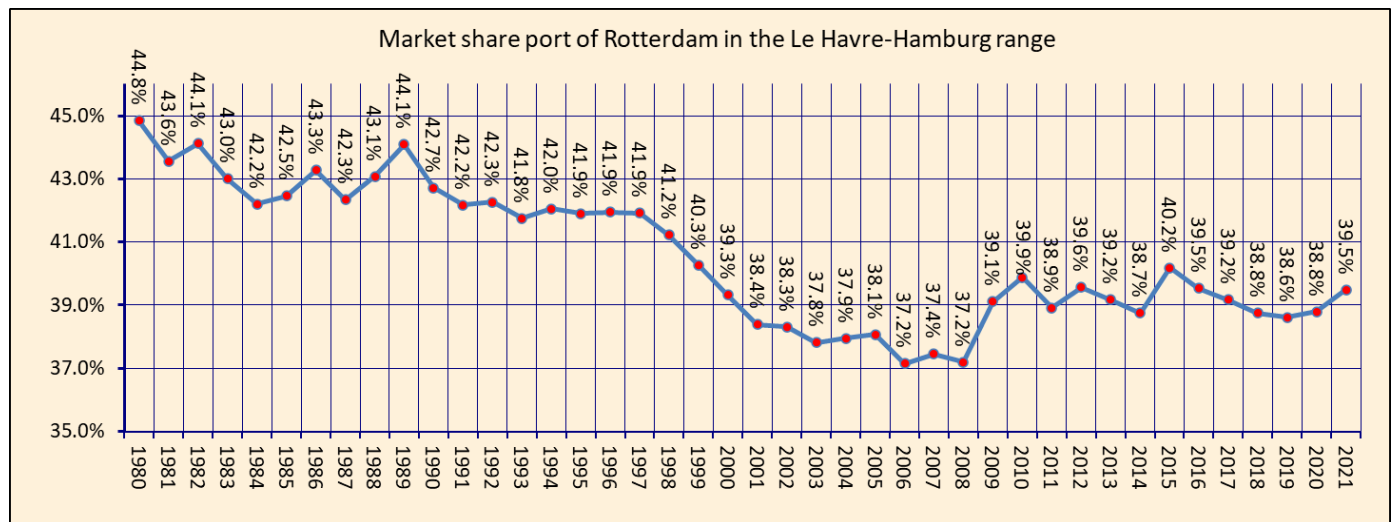
- The Port Authority (PA) has its own legal status
- The PA is directed by a daily management body (e.g. management board or management committee)
- The PA develops a port masterplan
- The PA is able to contract port land to third parties (e.g. terminal operators) in order to permit these parties to provide port services
- The PA is responsible to set the rules of agreements with third parties
- The PA issues safety regulations in addition to (obligatory) national/international regulations
- The PA issues security regulations in addition to (obligatory) national/international regulations
- The PA issues environmental regulations in addition to (obligatory) national/international regulations
- The PA is financially autonomous

2. KEY FACTS & FIGURES

2.1 Market share: position in the Le Havre-Hamburg range

Figure 2 shows the evolution of the market share of the port of Rotterdam in the Le Havre-Hamburg range. This range consists of the most important ports in Northern Europe (Hamburg, Bremen, Amsterdam, Rotterdam, Antwerp, Ghent, Zeebrugge, Dunkirk and Le Havre). From 1980 until 2008, the market share of the port of Rotterdam has decreased almost continuously. But from 2009 on, the port of Rotterdam regained some of its market share.

Figure 2: Evolution of the market share of the port of Rotterdam in the Le Havre-Hamburg range (in %)



Source: Pharos Logic, based on data port authorities

2.2 Maritime traffic

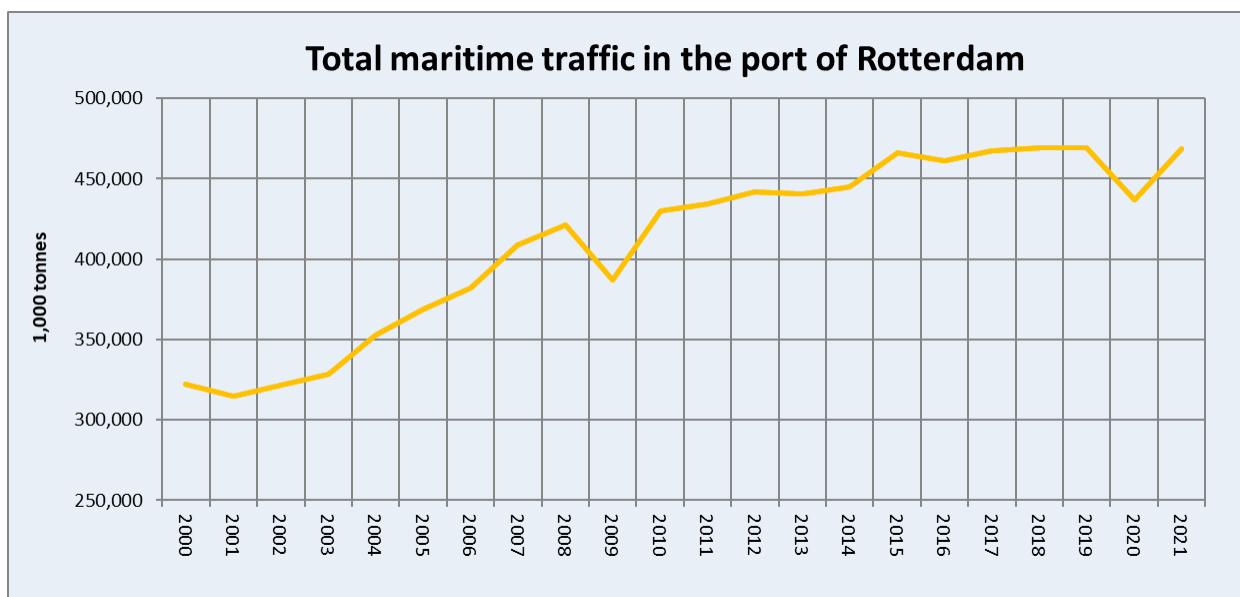
Total maritime traffic

Table 2 and figure 3 show the evolution of the total maritime traffic in the port of Rotterdam. Both show that the total traffic in the port of Rotterdam has increased almost continuously. The declines for 2009 and 2020 follow the general economic situation (2009: worldwide economic crisis; 2020: Covid pandemic).

Table 2: Total maritime traffic in the port of Rotterdam, 1000 tons

	Rotterdam	% growth
2000	322,072	
2001	314,646	↓ -2.3%
2002	321,837	↑ 2.3%
2003	328,145	↑ 2.0%
2004	352,591	↑ 7.4%
2005	369,200	↑ 4.7%
2006	381,751	↑ 3.4%
2007	409,086	↑ 7.2%
2008	421,070	↑ 2.9%
2009	386,957	↓ -8.1%
2010	429,926	↑ 11.1%
2011	434,551	↑ 1.1%
2012	441,528	↑ 1.6%
2013	440,464	↓ -0.2%
2014	444,733	↑ 1.0%
2015	466,363	↑ 4.9%
2016	461,177	↓ -1.1%
2017	467,354	↑ 1.3%
2018	468,984	↑ 0.3%
2019	469,402	↑ 0.1%
2020	436,807	↓ -6.9%
2021	468,709	↑ 7.3%

Source: Pharos Logic, based on data port of Rotterdam

Figure 3: Total maritime traffic in the port of Rotterdam, 1000 tons

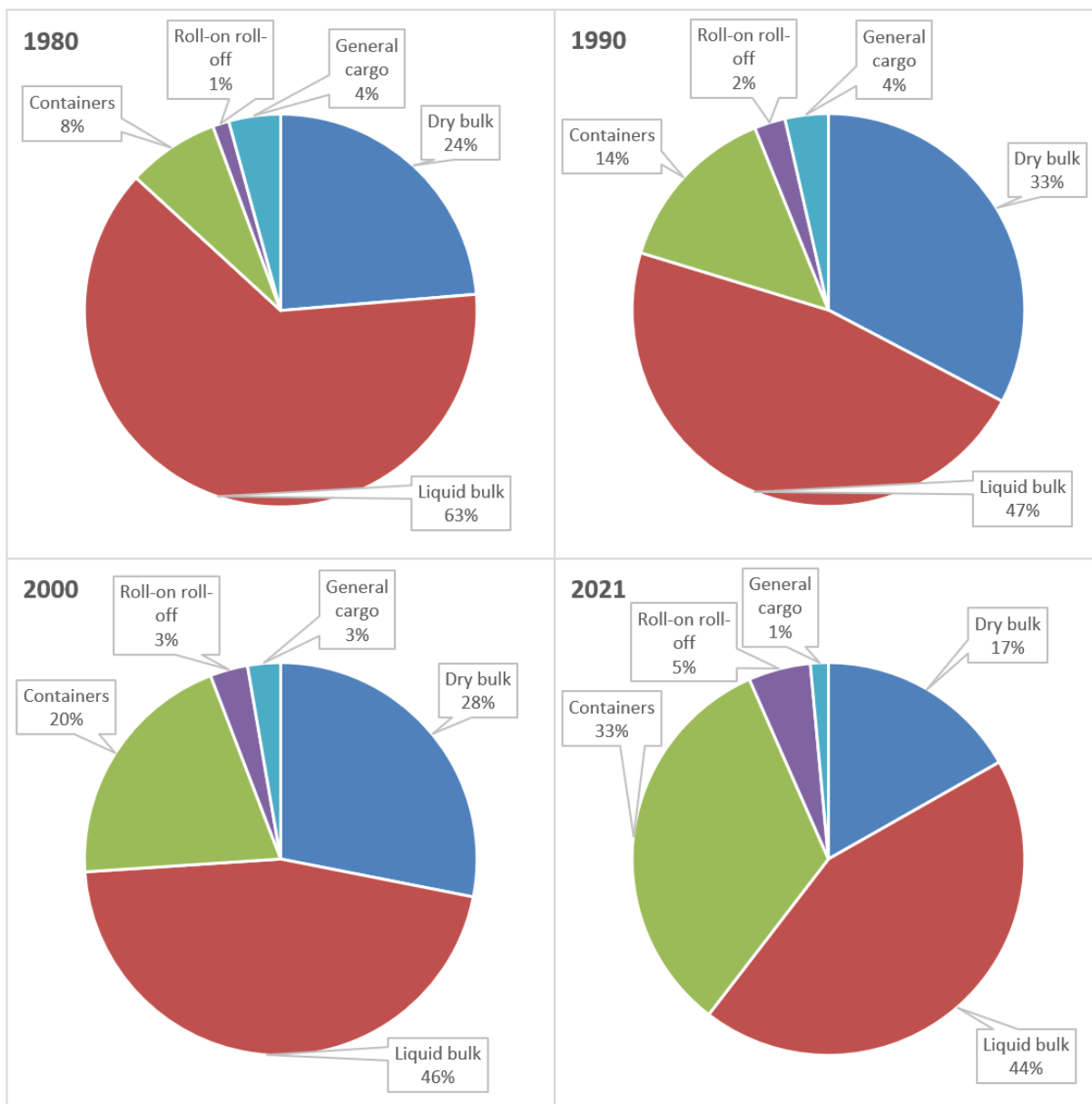
Source: Pharos Logic, based on data port of Rotterdam

2.3 Most important goods

Traffic portfolio

Figure 4 shows the most important goods for the port of Rotterdam: dry bulk, liquid bulk, containers, roll-on roll-off and general cargo. These figures reflect the nature of the port: bulk goods, such as petroleum, chemicals, coal and ores are very important in the traffic portfolio. Since 1980, the traffic composition has evolved from 87% bulk (63% liquid bulk and 24% dry bulk) to a situation in 2021 with 61% bulk and 33% containers. Over the years, the transshipment of containers became more and more important.

Figure 4: Pie charts for the most important goods in the port of Rotterdam



Source: Pharos Logic, based on data port of Rotterdam

Containers

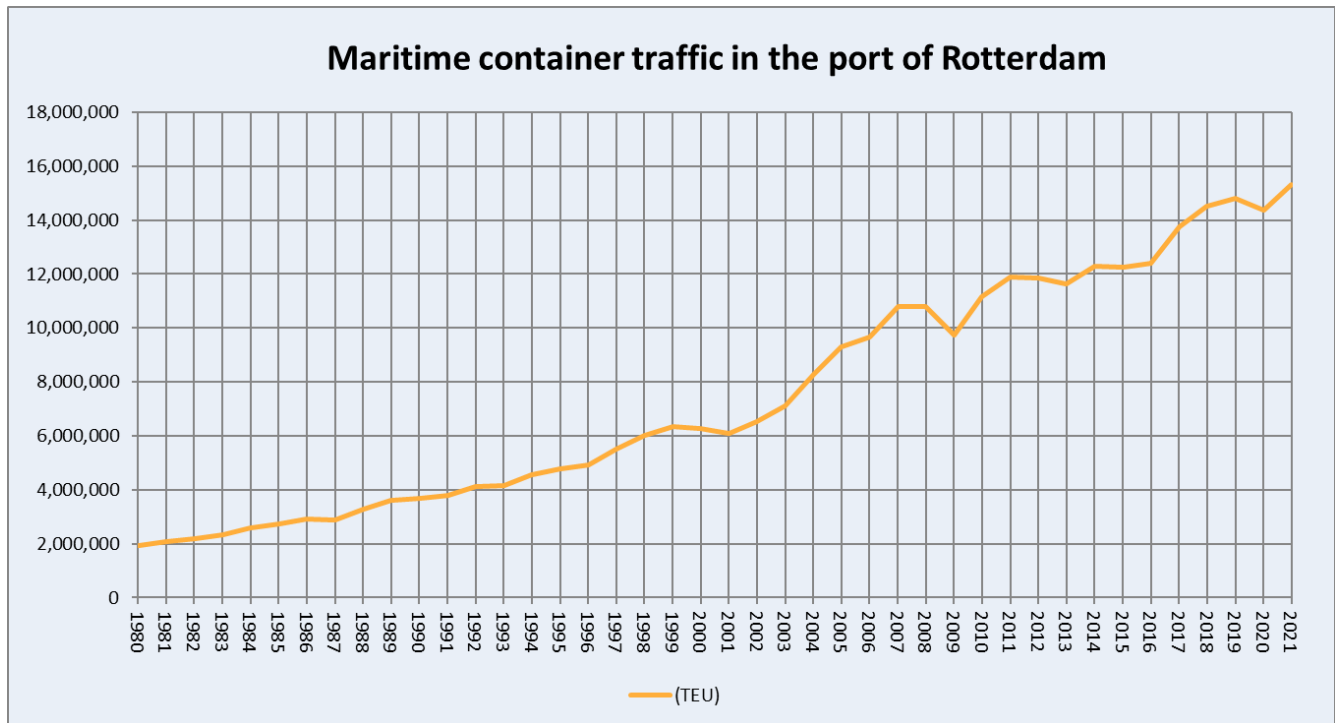
In the mid-1960s, shipping companies transported the first containers between the United States and Europe. While the first purpose-built container vessels could carry a few hundred containers, a modern container ship can carry 24,000 TEU and even more (for example the container vessel CMA CGM Concorde, a ship of 399 meters long and 61 meters wide). Since the first containership, every year new ships were built that were even larger than the year before. Container ships sail on fixed line connections between major seaports on different continents. Once these ships arrive in Northern Europe, they call at (a selection of) the ports of Hamburg, Bremen, Rotterdam, Antwerp, Zeebrugge, Felixstowe, Le Havre... Each line has its own selection of ports.

Table 3 and figure 5 show the evolution of the container traffic in the port of Rotterdam. Container traffic (loading and unloading) is usually measured in TEU. While growth was higher in one year than in the next and there were occasional small declines, the overall trend is upward. 2009 and 2020 were exceptional (worldwide economic crisis and Covid pandemic).

Table 3: Maritime container traffic in the port of Rotterdam, tons and TEU

	1000 tonnes	TEU	% growth (TEU)	
2000	65,143	6,275,000		
2001	62,174	6,096,142	↓	-2.9%
2002	65,814	6,506,311	↑	6.7%
2003	70,892	7,106,778	↑	9.2%
2004	82,567	8,291,995	↑	16.7%
2005	91,150	9,286,757	↑	12.0%
2006	94,802	9,653,232	↑	3.9%
2007	104,629	10,790,604	↑	11.8%
2008	106,999	10,783,825	↓	-0.1%
2009	100,280	9,743,290	↓	-9.6%
2010	112,293	11,145,804	↑	14.4%
2011	123,556	11,876,920	↑	6.6%
2012	125,428	11,865,916	↓	-0.1%
2013	121,251	11,621,249	↓	-2.1%
2014	127,598	12,297,570	↑	5.8%
2015	126,245	12,234,535	↓	-0.5%
2016	127,064	12,385,168	↑	1.2%
2017	142,642	13,734,334	↑	10.9%
2018	149,112	14,512,661	↑	5.7%
2019	152,905	14,821,497	↑	2.1%
2020	151,060	14,349,446	↓	-3.2%
2021	154,485	15,300,000	↑	6.6%

Source: Pharos Logic, based on data port of Rotterdam

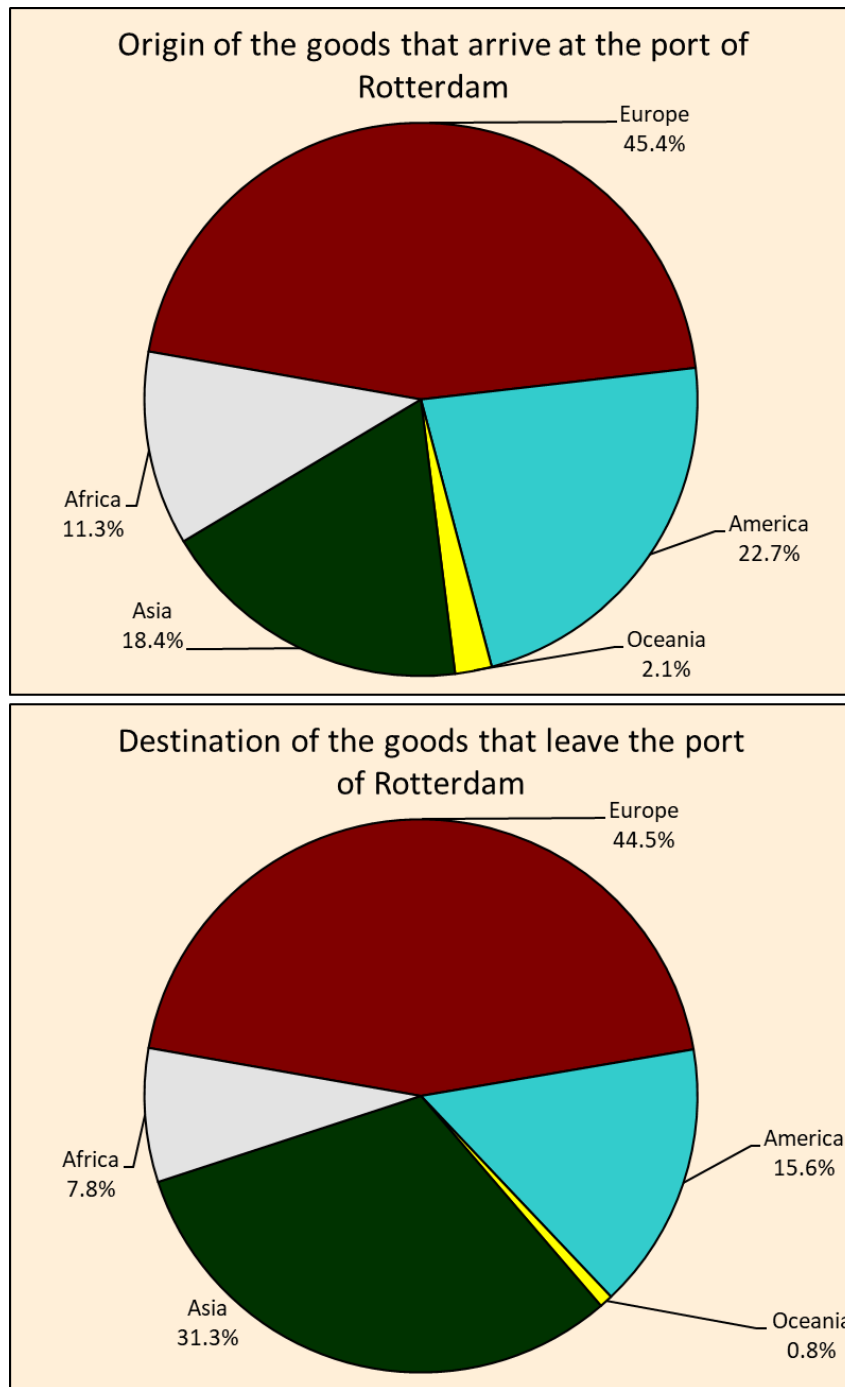
Figure 5: Maritime container traffic in the port of Rotterdam, TEU

Source: Pharos Logic, based on data port of Rotterdam

2.4 Origin and destination of the goods shipped

The port of Rotterdam has a maritime traffic portfolio that is dominated by origins and destinations in Europe. America is important for, among other things, the import of coal and the transport of containers. Africa is the origin of part of the crude oil and coal that is imported via Rotterdam. Asia is both the origin and destination of many goods that are transported by container. Figure 6 shows the main origins and destinations of the goods traded via the port of Rotterdam.

Figure 6: Origins and destinations of the goods shipped in the port of Rotterdam (2021)



Source: Pharos Logic, based on data port of Rotterdam

2.5 Central location of the port of Rotterdam in Northern Europe

Like the Belgian seaports, the port of Rotterdam is very centrally located in Europe. These ports are gateways to the European hinterland. Geographically speaking, 60% of the European purchasing power is located within 500 km of Belgium and the Netherlands. In this area, more than 100 million consumers can be reached.

3. PORT INFRASTRUCTURE

To realize the industrial output and the goods turnover in the ports, it takes a lot of equipment, port surfaces, specialized workforce, companies and infrastructure. The ports are more than quay walls and the activity in the ports is a lot more than loading and unloading of goods. In the next paragraphs, a few figures are given to illustrate the size of the port of Rotterdam.

3.1 Key facts & figures



- Total port area: 12,464 ha
- Land area: 7,966 ha
- Of which rentable sites, including Maasvlakte 2 - phase 2: 6,260 ha
- Water area: 4,498 ha
- Total length Rotterdam's port area: 42 km
- Water depth N.A.P⁵. (max.): 24 m
- Depth Eurogeul in the North Sea N.A.P. (max.): 26 m
- Length Eurogeul in the North Sea: 57 km
- Pipelines: 1,500 km
- Quay length: 79.5 km
- Banks (slopes): 176 km
- Sea and Inland jetties: 13

Source: Port of Rotterdam

⁵ N.A.P.: 'Normaal Amsterdams Peil' (translated 'Normal level of Amsterdam'): reference height or level to which height measurements in the Netherlands are related.

3.2 Infrastructural development

Section 1.1 of this report provided a historical overview of the infrastructural development of the port of Rotterdam. The most recent major expansion of the port is Maasvlakte 2. We will pay more attention to this expansion here.

The new port area 'Maasvlakte 2' has been constructed in phases on behalf of the Port of Rotterdam Authority. Maasvlakte 2 connects directly to the previously constructed Maasvlakte. Of the total area of 2,000 hectares, half is intended for port-related activities. The remaining space is needed for infrastructure (290 hectares), sea defences (230 hectares) and waterways/port basins (510 hectares). Maasvlakte 2 is primarily intended to facilitate chemical and container transshipment companies. The new ports (docks) have a draft of 20 meters and are therefore accessible for the latest generation of large container ships.

The newly constructed area is intended for container transshipment, distribution and the chemical industry. These business sectors were chosen because a lot of growth is expected in the coming years.

The intended distribution is as follows:

- Storage and transshipment of containers: 620 hectares
- Chemistry (including innovative industry): 210 hectares
- Distribution: 170 hectares

Maasvlakte 2 has been constructed in the Voordelta, a protected nature reserve. When designing and furnishing the new port area, an attempt was made to spare nature as much as possible. Turning 2,000 hectares of seabed into a port area, inevitably has consequences for plants and animals, so compensatory measures have been taken. To compensate for the disappearance of the seabed in the Voordelta, a seabed protection area is established southwest of the land reclamation in the North Sea. It concerns 25,000 hectares of protected seabed, containing resting places for various animal species. Bottom-disturbing fishing is no longer allowed here.

North of Maasvlakte 2, between Hoek van Holland and Ter Heijde, a new dune area is built along the coast. This area is constructed to compensate for the negative effects of the presence of Maasvlakte 2 on the Voornse dunes.

Maasvlakte 2 is the biggest civil engineering project in the Netherlands since the Delta Works⁶. The area opened on 22 May 2013.

3.3 Accessibility of the port

The port of Rotterdam has optimum accessibility thanks to its favourable geographical position right on the North Sea and at the mouth of the river Rhine. The terminals are directly adjacent to deep water and can be accessed from the open sea quickly and safely without the need for sea locks. This allows vessels to be unloaded and loaded in no time, so that they can be on their way to their next destination quickly. An extensive intermodal network of rail, inland shipping, road, short sea and pipelines provides a wide selection of connections to the rest of Europe.

3.4 Shipyards / ship repair

The port of Rotterdam has several shipyards and ship repair facilities.

⁶ The Delta Works (Dutch: Deltawerken) is a series of construction projects in the southwest of the Netherlands to protect a large area of land around the Rhine–Meuse–Scheldt delta from the sea. Constructed between 1954 and 1997, the works consist of dams, sluices, locks, dykes, levees, and storm surge barriers located in the provinces of South Holland and Zeeland.

4. VALUE ADDED, EMPLOYMENT AND INVESTMENTS

4.1 Introduction

Every year, the Erasmus Center for Urban, Port and Transport Economics (Erasmus UPT) produces a report⁷, the 'Port Monitor', on the economic significance of the Dutch seaports on behalf of the Dutch Ministry of Infrastructure and Water Management. This is done in collaboration with the Central Bureau for Statistics and the Dutch port authorities. Below we summarize the most important results for the port of Rotterdam.

4.2 Employment

Employment in the port of Rotterdam decreased slightly in 2020 compared to 2019 to 88,000 employees. The relatively strong fluctuations between 2018 and 2019 can be attributed to a slightly changed methodology and may therefore not correspond to reality, according to the Port Monitor.

Table 4: Direct employment in the port of Rotterdam (FTE)

Sector	Employees (FTE)		
	2018	2019	2020
Node	54,942	58,621	57,418
Maritime shipping	1,820	1,910	1,810
Inland shipping	8,867	8,471	7,876
Road transport	25,427	27,528	27,136
Rail transport	1,133	1,176	1,111
Pipeline	56	57	55
Services for transport	9,350	10,740	10,870
Transshipment/storage	8,290	8,740	8,560
Location	35,220	30,780	30,600
Food industry	1,380	1,620	1,670
Chemical industry	4,010	4,360	4,310
Base metal and metal products industry	750	770	800
Other industry	8,210	5,930	5,780
Wholesale	4,590	3,940	4,060
Other, business and non-business services	16,280	14,160	13,980
Total	90,162	89,401	88,018

Source: Port Monitor 2021

4.3 Most important companies

There is no official Top-10 of the largest companies in the port of Rotterdam. Many large companies have a branch in the port of Rotterdam, for example: Vitol, Arcelor Mittal, Exxonmobil, Vopak, etc. All companies can be searched via the following online tool: <https://rotterdam.navigate-connections.com/companies>.

⁷ Streng, M., L. Van der Lugt en R. Van Houwelingen, 2021, 'Havenmonitor 2021 - De economische betekenis van Nederlandse zeehavens', Erasmus UPT, Studie in opdracht van Ministerie van Infrastructuur en Waterstaat, November 2021.

5. SUSTAINABILITY, INNOVATION AND TRENDS

5.1 Introduction

The pursuit of sustainability has been going on in seaports for decades, but since the Paris Climate Agreement of 2015, the climate ambitions have become more concrete. Greenhouse gases have to be reduced by at least 90% by 2050 compared to 1990 (gross emissions). In July 2021, the European Commission adopted the “Fit for 55” package, consisting of a number of legislative proposals from the European Commission with a view to achieving a binding target of 55% lower net greenhouse gas emissions by 2030.

The following lines describe some trends that are mainly related to the pursuit of sustainability. Some cases/examples in the port of Rotterdam are also described. This topic is very broad and can only be discussed very briefly in this report. The most important source for this information is the website of the Port of Rotterdam Authority.

5.2 Trends

Digitisation

- The Port of Rotterdam Authority’s digitisation initiatives either concern (1) better control and management of the port and port infrastructure or (2) improved insight into or efficiency of logistics processes. Below we will give some examples.
- For example, the Harbour Master Management Information System (HaMIS) works as a digital network. It is an interactive system in which all shipping traffic is planned, monitored and administered. Portbase provides a Port Community System (PCS). This is a digital solution for the administration and document flows that are related to freight transport, creating greater efficiency, lower planning costs, better and more transparent planning, faster cargo handling and fewer errors.
- Port of Rotterdam Authority, IT partners IBM, Cisco, Esri and Axians have been working together to provide an Internet of Things (IoT) platform. The Port Authority uses this cloud platform to collect and process data from sensors located throughout the port. Real-time information about infrastructure, water and air comes in, enabling the port of Rotterdam to improve its services.
- In the port a lot of parties work together to get goods from A to B efficiently, quickly and safely. To facilitate this, the coordination and the exchange of information take place via the Port Community System (PCS) of Portbase.
- Another example of how digitisation contributes to sustainability is the study that is commissioned by the IMO-Norway GreenVoyage2050’s Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA). Containerships can reduce fuel consumption and the thereby caused carbon dioxide emissions by 14% on a per voyage basis using just-in-time (JIT) arrival. Just-in-time (JIT) arrivals allow ships to optimise speed during their voyage to arrive in port when berth, fairway and nautical services are available. It is the first global study on the impact of Just-in-time arrivals using real time tracking and fuel consumption data from container vessels in operation. The port of Rotterdam has participated in this study by supplying validation data on arrival and departure times.

- The Port of Rotterdam Authority manages monitoring networks in the port of Rotterdam in cooperation with Rijkswaterstaat⁸. The Rotterdam Operational Flow Model (OSR) also provides information on expected water levels and current speeds in the port.

Energy transition

- Hydrogen is a replacement for natural gas in generating heat in the process industry. Hydrogen is a building block for the manufacture of products in the sustainable chemical industry. Hydrogen is also developing as an important energy carrier in aviation, shipping and heavy road transport, and will be used to heat homes and greenhouses. The port of Rotterdam promotes the large-scale implementation of the hydrogen economy. To ensure the success of these plans, the port collaborates with various international partners on the realisation of a solid hydrogen import chain.
- Europe's largest green hydrogen plant will be built on Maasvlakte 2. Shell has taken the final investment decision for this. The plant will be named 'Holland Hydrogen 1' and is expected to be operational in 2025. The 200MW electrolyser will be constructed on the Maasvlakte 2 and will produce up to 60,000 kg of renewable hydrogen per day. The renewable power for the electrolyser will come from the offshore wind farm Hollandse Kust (noord), which is partly owned by Shell.
- HyTransPort is a new hydrogen pipeline through the port of Rotterdam that will form the backbone of the hydrogen infrastructure in Rotterdam. This project is a joint venture between the Port of Rotterdam Authority and HyNetwork Services. The pipeline will connect to the national and international hydrogen networks and will provide a connection to Chemelot in Limburg, North Rhine-Westphalia in Germany and other European regions.
- The Port of Rotterdam Authority is working together with many regional and chain partners to develop new, circular value chains, for example around the chemical recycling of plastics and the reuse and recycling of batteries. Another example: 16,000 Rotterdam households are being heated using residual heat from a refinery in Pernis. And an underground pipeline will be constructed to transport residual heat from companies in the port to up to 120,000 homes and other buildings in the region of The Hague. The construction of the WarmtelinQ pipeline is expected to be completed in 2025.
- The capture and storage (CCS) of CO₂ is one of the tracks in the transition towards a climate-neutral industry by 2050. In Rotterdam, the Porthos project is in preparation, which will enable various companies to supply CO₂ to a transport pipeline that runs straight through the port area. The final destination of the CO₂ will be an empty gas field beneath the North Sea for permanent storage. The port of Rotterdam will cooperate with North Sea Port⁹ and the port of Antwerp to jointly investigate how to connect these ports to be able to make use of this CCS infrastructure. As the European Union considers CCS to be an important tool in combating climate change, the 'CO₂ TransPorts', as the project is called, has received PCI¹⁰ status. In principle, this means that the European Union is prepared to provide a subsidy for the project.
- Shore-based power is important to reduce the emission of particulate matter, nitrogen, and carbon dioxide. Every year, some tens of thousands of vessels put in at the port of Rotterdam. Moored at the quay, these vessels still use their generators for the energy required on board. Shore-based power makes

⁸ Rijkswaterstaat is part of the Dutch Ministry of Infrastructure and Water Management and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands.

⁹ North Sea Port is the result of the merger of the ports of Ghent (BE), Vlissingen (NL) and Terneuzen (NL).

¹⁰ Project of Common Interest

reducing these emissions possible by providing a clean energy source for these vessels. The port of Rotterdam is conducting four studies to prepare Onshore Power Supply systems (OPS). This is done at four major terminals in the port of Rotterdam: ECT (Amazonehaven), APMT2 (Amaliahaven), VOPAK (Botlek) and the Cruise terminal (Wilhelminakade).

- Energy transition is a very broad topic and many new initiatives are taken. Other examples are battery recycling from electric vehicles, plastic recycling, chlorine waste as new raw material and energy, etc.

Innovation

- Rotterdam offers a wide range of opportunities for innovation and entrepreneurship. PortXL is an organization that helps start-ups and scale-ups from all over the world to accelerate their innovations. The participants gain access to a network of mentors, investors, maritime and corporate companies and sponsors.

6. FURTHER INFORMATION

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Wilhelminakade 909
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PO Box 6622
3002 AP Rotterdam
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Route description

<https://www.portofrotterdam.com/en/route-description>

General website

<https://www.portofrotterdam.com/en>

Port of Rotterdam

Nautical question? → Harbour Coordination Centre → +31 10 252 1000

Breakbulk, contract management, port dues etc., phone numbers and contact forms:

<https://www.portofrotterdam.com/en/contact/departments>

Business or general question? → Port of Rotterdam Authority → +31 10 252 1010

Asia Desk, Commercial delivery, containers, Germany desk, Industry & Bulk, International representatives, Logistics, New Business & portfolio, Port of Rotterdam International, Real estate, Shippers & forwarders, phone numbers and contact forms:

<https://www.portofrotterdam.com/en/contact/teams>

Rotterdam Transport Index

Detailed information about 1,600 companies in and around the port of Rotterdam, to ship your private or business goods to/from Rotterdam:

<https://rotterdam.navigate-connections.com/companies>

7. SOURCES

<http://www.worldportsource.com>

<https://rotterdam.navigate-connections.com>

<https://www.google.com/maps>

<https://www.marineinsight.com>

OECD, 2010, 'Transcontinental infrastructure needs to 2030 / 2050 North-West Europe gateway area - port of Rotterdam case study - Rotterdam workshop - final report'

Port of Rotterdam authority: <https://www.portofrotterdam.com/>

Port of Rotterdam, 2022, 'Samen bouwen aan de haven van morgen - Make it happen – Jaarverslag 2021'

Satellite maps: Google maps

Streng, M., L. Van der Lugt en R. Van Houwelingen, 2021, 'Havenmonitor 2021 - De economische betekenis van Nederlandse zeehavens', Erasmus UPT, Studie in opdracht van het Ministerie van Infrastructuur en Waterstaat, November 2021

Van de Ven, G.P., 2008, 'De Nieuwe Waterweg en het Noordzeekanaal - Een waagstuk - Onderzoek in opdracht van de Deltacommissie'

Various press

Verhoeven, P., 2010, European port governance report of an enquiry into the current governance of European seaports, ESPO.

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