Port city – Their futures go hand in hand

During the past 150 years, the development of Rotterdam has been characterized with that of industry and trade. And that’s not to say that it’s all been smooth sailing. The industrial port and the city have had to adapt to changing circumstances, particularly when it comes to industrial growth and the availability of public infrastructure. The city and port are not only dependent on one another, but also mutually reinforcing in other areas too.

Innovations are essential for development in both the City of Rotterdam and its industrial centers. The University of Rotterdam is a key force of the research and academic world, with the University of Technology as a leading partner. Collaborating with the city government and other local authorities is essential in innovation efforts. One of the challenges is to create a future-proof environment for innovation that can support the development of the city and port in the future. It is essential to build a strong partnership that ensures the parties working together.

The short answer is that it comes to the need for innovation, the parties involved need to work together. In the Port Vision 2030, the city and port will be working closely together in the Stadshavens, the area that includes the main harbor area of Rotterdam. This will ensure that the port and city together will work to achieve the desired outcome.

The municipal authority put the emphasis on Rotterdam as an attractive place to live and work for every community and nature and environmental organizations work together to realize a vital port complex in an attractive living environment. The port and city need to go hand in hand with the city government and other local authorities.

The Port Vision 2030’s main purpose is to focus on the development of the port and city. This is done by focusing on the following five points:

1. Education. Maintenance of installations is a strategic competitive asset. Increasing the productivity of the city and port will come through professional education. Students, professionals at a vocational level. Both in logistics and technology.

2. Innovation. A solid innovation agenda is necessary to realize the intended transitions. The quality port goes hand in hand with the quality city.

3. Hinterland connections. The port- and industrial complex competes partially based on the quality and capacity of its hinterland network. Missing links in this network need to be realized fast (hard infrastructure). The information networks also need to be state of the art (soft infrastructure). Rotterdam needs to become the Northern Gateway to Europe.

4. Environmental sustainability. A sustainable development must be achieved. An example of this is the Port Vision 2030’s aim to make Rotterdam a carbon-neutral city. This can be achieved through the use of new technologies and energy sources.

5. Inclusiveness. The Port Vision 2030 must be inclusive and open to all communities. The city and port must work together with the local authorities, educational organizations, and environmental organizations to ensure that everyone is included.

In conclusion, the Port Vision 2030 is an important step in the development of Rotterdam. It provides a blueprint for the future of the city and port, ensuring that they will continue to grow and thrive together.

Deltalinqs urges for intense cooperation

The Dutch holdings believe in the Port Vision 2030 and the ambitions of the Port of Rotterdam. The Port and Deltalinqs have a long history of working together for the development of the port and city. Deltalinqs urges for intense cooperation in realizing the Port Vision 2030.

The Port Vision 2030 can be seen as a long-term investment in the development of the port and city. Deltalinqs urges for intense cooperation to ensure that the Port Vision 2030 is realized in the best possible way. This requires close collaboration between all stakeholders, including the Port of Rotterdam, the city government, and the local authorities.

Deltalinqs is a steering partner in the Port Vision 2030 and is committed to realizing the Port Vision 2030. Deltalinqs urges for intense cooperation to ensure that the Port Vision 2030 is realized in the best possible way. This requires close collaboration between all stakeholders, including the Port of Rotterdam, the city government, and the local authorities.

Deltalinqs urges for intense cooperation to realize the Port Vision 2030. This requires close collaboration between all stakeholders, including the Port of Rotterdam, the city government, and the local authorities. Deltalinqs is committed to making a constructive contribution to the realization of the Port Vision 2030.
1 Starting point: The port in 2011

The Port Vision 2030 sets out the ambitions for the future of the port of Rotterdam. The Port Vision is the compass: ambitions are a spot on the horizon, even when circumstances change. The keyword is flexibility.

For decades, industry and logistics have formed the mainstays of the port of Rotterdam. This is due to the important cornerstone for the welfare of the region, the Netherlands and Europe, which is to take action with a clear vision. The port is very important to the region, the Netherlands and Europe, both in terms of jobs and employment and prospects.

2 Trends, estimates and prospects

Trends and developments impacting heavily on the future of the port are:

- changes in the energy and fuel mix;
- use of ICT;
- climate change, sustainability;
- integration of supply chains;
- knowledge economy, growth in employment;
- shift in the balance of the world economy;
- Low Growth: approx. 475 million tonnes
- High Oil Price: approx. 575 million tonnes
- European Trend: approx. 650 million tonnes
- Global Economy: approx. 750 million tonnes

In 2010, the port of Rotterdam achieved a total throughput of 430 million tonnes. Four scenarios were used to estimate the throughput for 2030: Global Economy: approx. 750 million tonnes, European Trend: approx. 650 million tonnes, High Oil Price: approx. 575 million tonnes, Low Growth: approx. 475 million tonnes.

Two prospects describe extreme and inspiring pictures of the distant future.

3 The vision of port and industry in 2030

In 2030, Rotterdam is Europe’s most important port and industrial complex. It is a strong combination of the Global Hub and Europe’s Industrial Cluster, both leading in efficiency and sustainability. Rotterdam is closely linked to other North West European industrial and logistic areas.

Leading businesses make long-term investments in the most modern facilities. Close cooperation between businesses, government and knowledge institutions results in a high-quality labour market, living environment and accessibility. Our adaptive power is unique. This makes the complex an important cornerstone for the welfare of the region, the Netherlands and Europe in 2030.

Global Hub Vision

In 2030, Rotterdam is the leading European hub for global and intra-European cargo flows. The Global Hub for Containers, fuel and energy. Rotterdam forms an integrated network with the hinterland. Rotterdam is leading in sustainable and efficient chains.

Europe’s Industrial Cluster Vision

In 2030, Rotterdam’s industrial and energy complex functions as an integrated cluster with Antwerp and is the largest, most modern and sustainable petrochemical and energy complex in Europe. This complex competes on a global scale thanks to the significant cluster advantages, integrated supply chains and energy efficiency. The transition to sustainable energy production and bio-based chemicals is in full swing.

4 Setting the course

The Global Hub and Europe’s Industrial Cluster aren’t just some out of nowhere challenges. The challenges lie in substantially increasing economic activity and throughput, in the industry’s transition to non-fossil fuels, in integrating the energy consumption and emissions and in achieving a reliable, efficient and sustainable logistics system.

There is limited physical space, while the challenge is to reduce the environmental impact and improve the quality of the living environment.

Port Compass describes the ambitions and challenges for ten success factors:

- investment climate
- space
- accessibility
- environment, safety and living environment
- work
- city and region
- business and regulations
- knowledge development and innovation
- Europe

The public and private sector (within and beyond the port), citizens and interest groups will jointly determine the port’s success. Thanks partly to all the investments by businesses, the government and the Port Authority, citizens and interest groups will jointly determine the port’s success.

5 Agenda

The actions crucial to the realisation of the Global Hub and Europe’s Industrial Cluster are:

1. Technical and social innovation is essential to the realisation of this vision, from a more intensive use of space to the updating of laws and regulations.

2. Specific to the realisation of the Global Hub:
   - Significant improvements in supply chain efficiency.
   - Expansion of the European networks of inland hubs as well as rail and inland shipping infrastructure.
   - Energetic expansion of the national road network, including the Blankenburg tunnel and A44 south link.

3. To improve accessibility:
   - Much better use of existing infrastructure through proactive traffic management for all modes of transport.
   - Energetic expansion of the national road network, including the Blankenburg tunnel and A44 south link.

4. To improve the quality of the living environment:
   - Substantial relocation in narrow areas.
   - Creation of green zones between the port and the region, on the one hand, and an intensification of the city’s use of the border zone in the City Ports area, on the other.

5. Specific to the realisation of the Global Hub:
   - More highly educated employees.

6. Specific to the realisation of the Industrial Cluster:
   - More highly educated employees.

7. Specific to the realisation of both visions:
   - More highly educated employees.
Thanks to entrepreneurship, vision, courage and through the joint efforts of the public and private sector, the port has developed into the most important industrial area and the largest logistics hub in Europe. Via Rotterdam, Dutch and international companies have easy access to world markets. Without the port, consumers would not have iPhones, cars, tilapia, electricity or petrol. Transport, logistics and the chemical industry are important sectors of the Dutch economy which owe their top ranking in the world, at least in part, to the port of Rotterdam. At the same time, the port is also a place where a lot of people simply earn their living. The importance of the port to Dutch society and its economy presents the government, the business community, stakeholders and the Port of Rotterdam Authority with the task of ensuring that the port maintains and strengthens its position in the future. This requires ambition and a clear vision for the future:

Port Compass. Direct the future. Start today.
The value of the port and industrial complex for The Netherlands

The quantitative economic importance of the Rotterdam port complex is best expressed in the figures below. For this reason the figures do not indicate the absolute value of the port for The Netherlands. This strategic value is not expressed in absolute added value and employment, but hints at the contribution to the international innovation-driven competitiveness of the Dutch economy. This strategic value was studied by the Rotterdam School of Management, leading to the following conclusions:

- The port makes a substantial contribution to the international competitiveness of the Dutch economy.
- The port and the surrounding industrial zone are home to many global concerns which have high expectations from this.
- The competitive position of the port of Rotterdam and other Dutch ports, foreign ports and other key logistics hubs. The researchers draw the following conclusions:

_1. Strategic value and employment

<table>
<thead>
<tr>
<th>Category</th>
<th>Value 2010 (MILLION)</th>
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<tbody>
<tr>
<td>Added value</td>
<td>15.54F</td>
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<tr>
<td>Indirect added value</td>
<td>6.7E</td>
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<tr>
<td>Direct added value</td>
<td>3.1F</td>
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<tr>
<td>Indirect employment</td>
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<tr>
<td>Direct employment</td>
<td>50,000 people</td>
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<tr>
<td>Annual average business investment</td>
<td>1.5 billion</td>
</tr>
<tr>
<td>Indirect employment</td>
<td>55,000 people</td>
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<tr>
<td>Direct employment</td>
<td>90,000 people</td>
</tr>
<tr>
<td>Direct and indirect added value</td>
<td>3,3% of GNP</td>
</tr>
</tbody>
</table>

_2. Added value and employment

Strategic value of the port complex for The Netherlands

This strategic value can be increased by enhancing the dynamics, competitiveness and innovation in the port and by further developing the connectivity between the port of Rotterdam and other Dutch ports, foreign ports and other key logistics hubs. The researchers draw the following conclusions:

- The port can develop with social value (instead of the mere social single focus) on efficiency and innovation.
- Competition within the port not only to better ports, but also to innovation, which is in the port to remain successful in the long conditional.
- Innovation requires networking, establishing contacts and partnerships both between businesses, knowledge institutions and government. Technological innovations make only an estimated 35% of overall innovation. Regulatory innovations account for 75%. Organizations, procedures, structures and regulatory flexibility are all of vital importance.
- The competitive position of the port of Rotterdam and its businesses is strengthened by engaging in strategic partnerships with other (North-) ports and with ports in other parts of the world.
- Competition in the Rotterdam world break Jones states strategic value for the Netherlands.

_3. From discussion to implementation

The Port Vision 2030 is a logical successor to the Port Plan 2010 (promulgated in 1993) and the Port Plan 2025 (completed in 2004). These plans for the port centered the construction of Maasvlakte 2, the development of City Ports the widening of the A15 and the covenant for the right bank of the river Maas. All these projects are now under construction. Port Compass continues this long-term approach in the development of the port and industrial area, but also broadens its horizon beyond the port. The vision (Chapter 3) is precedes by a description of relevant trends and forecasts of the possible developments in throughput in the next five decades (Chapter 2). Port Compass is followed by a number of success factors and undertakings that need to be fulfilled if the vision is to be realized (Chapter 4) and an agenda with the most important points of action (Chapter 5).

_4. Shaping ambition

Envisioning the future is no easy task, and 2020 is not far away. The pace of change is increasing and developments will affect the port in ways that will be difficult to predict. It is vital to prepare for unexpected and unpredictable developments. The port will need to adapt at a fast and successful rate will remain successful in the future too. That’s why flexibility is an aspirational word in the Port Compass.

As nobody exactly knows what the future holds, this vision does not present a detailed, definite plan for the port in 2030, but charts a strategic course for the port heading towards 2020. This course concentrates on measures to strengthen the position of the port and the city, irrespective of specific global developments. It must be possible to change course quickly to cope with changing circumstances. It is essential to monitor trends and developments continuously. A strong port requires a strong infrastructure in a number of respects. The port is a part of a spatial structure, embedded in residential and natural areas. Also, the port and its industries need the people who work there. These physical, social and organizational aspects, the hardware and the software, all feature in the Port Compass.
Port Vision 2030

**Process Port Vision**

- Current situation
- Port and industrial complex
- Vision
- Global Hub & Europe’s Industrial Cluster
- Backcasting
- Forecasting
- Trends & Developments
- Success factors
- Agenda

**Analysis of trends & developments**
The port operates on an international playing field. It is vital to identify and understand the global developments affecting the port, so that opportunities are seized and risks are dealt with adequately and promptly. The analysis of trends and developments serves as the starting point for the Port Compass.

**Forecasting**
Based on the analysis of trends and developments, our macro-economic scenarios from the CPB Netherlands Bureau for Economic Policy Analysis and the European Commission were selected. Using the Global Economy, European Trend, High Oil, Price and Low Growth scenarios, long-term variations were made for the potential size outlook of freight passing through the port of Rotterdam. These forecasts were discussed with the CPB and a large number of clients, and then translated into the future needs for land, environmental capacity and labour, and accessibility problems.

**Backcasting**
When backcasting is concerned with dating possible futures in order to identify certain plans, problems areas and opportunities, backcasting is all about putting desirable futures backcasting from these futures to 2011, one can see what needs to be done now. These futures are wide-ranging and extreme but, by reflecting on potential variations, one can grasp the possibilities.

**Vision**
The vision for the future of the port was formulated on the basis of these three components. The Global Hub outlines the vision for the logistical aspect of the port, while Europe’s Industrial Cluster deals with the vision for industry. The Global Hub segments the port into four parts, while Europe’s Industrial Cluster deals with the vision for industry.

**Trends & Developments**
There are many preconditions for the realisation of the Global Hub and Europe’s Industrial Cluster. Nine success factors, with the CPB and a large number of clients, and then translated into the future needs for land, environmental capacity and labour, and accessibility problems.

**Success factors**
- Land use
- Accessibility
- Environment & quality of life
- City & region
- Work
- Infrastructure & Shipping
- Inovation
- Laws and regulations
- Europe

**Agenda**
The all results in an implementation plan, which outlines the main actions needed to realise the vision. This all results in an implementation agenda, which outlines a series of corresponding tasks, have been identified.

**Past returns**
The port has performed well over the past few decades. Rotterdam is a strong position in industry and logistics, to be on the European geographic location and the Dutch entrepreneurial spirit: having the courage to act with vision. The port of Rotterdam enjoys a strong position, thanks to the scale and diversity of the activities that go on there. Industry and logistics reinforce each other, but also ensure that the port as a whole has the flexibility to respond to changing circumstances. The mean economic scenario was not the Global Hub; Rotterdam withstands the crisis much better than other more specialised European ports.

**Starting today**
Maintaining Rotterdam’s top spot will not be easy. However, there are opportunities, but there are also threats. Big investments and long amortisation periods mean that changes in Rotterdam’s port and industrial complex cannot be achieved overnight. The pace of global developments is increasing all the time. The Asian and South American economies are growing rapidly, while the European economy is lagging behind. Therefore, purpose and decisiveness are required if we are to guarantee the port of Rotterdam’s position and its contribution to prosperity in the future too.

**In order to get ahead of how fast things can develop within twenty years, we look back at the late 1980s and early 1990s.**

The Berlin Wall had just fallen, China was still a country that people associated with the Cultural Revolution. But the land of Rosenfrans and not much seemed to happen in India. Brussels was a country that people spoke about ‘somewhere’ on ‘Europe’. The European Commission dominated the economic discourse, led by Milton Friedman. Mobile phones were for the rich and the powerful, the Internet was a tool for military strategists and academics. Dutch astronaut Wubbo Ockels had just returned from space. For the first time in many years, the Port of Rotterdam weathered the crisis much better than other more specialised European ports. But the port is also on the brink of a number of big challenges. As a logistics hub, the port of Rotterdam competes mainly with European counterparts, but the industries compete on a global level. This means that Rotterdam’s position on the European market is relatively secure, while the region faces a big challenge if it is to remain attractive to the chemical industry.

**2030 is closer than you might think**

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Therefore, purpose and decisiveness are required if we are to guarantee the port of Rotterdam’s position and its contribution to prosperity in the future too.
The port of Rotterdam competes primarily with the ports in the Hamburg-Le Havre (HLH) range. Within this group, Rotterdam is by far the largest port, with a market share of almost 38%. The SWOT analysis on the next page gives an idea of Rotterdam’s starting position.

The points from this SWOT analysis will be referred to in the Vision (Chapter 3) and the different success factors (Chapter 4).

Opportunities
• Rotterdam’s hinterland can be reached by all modes of transport;
• Rotterdam can develop into the only container port with unrestricted nautical access (for ULCCs), offering a combination of transhipment hub and gateway;
• The construction of the Seine-Nord Europe Canal will bring Northern France within reach as a new inland shipping market in about 2020;
• Increase in scale of (bulk) shipping increases the chances of occupying a continental or intercontinental hub position for crude oil, coal and ore;
• Growth opportunities in the market for mineral oil products and vegetable oils;
• Extended connections between the chemical industry clusters in Northwest Europe reinforce the global competitive position;
• CCS provides opportunities for preserving or even expanding the position in fossil energy generation;
• Biomass is a potential growth market for co-firing in coal-fired power stations and for dedicated biomass power stations in the long term;
• The transition to sustainable energy and production provides opportunities for the long term, due to the available infrastructure and because almost all global players are actively involved.

Threats
• In Northwest Europe there will be considerable capacity expansion in the container sector until 2020. This can result in fierce competition;
• To an increasing extent, industrial and economic growth is taking place in the BRIC countries and Eastern Europe; Northwest Europe is becoming less attractive to new industries.
• Rising prices and declining availability on the world market for (energy) resources weaken the position of (the energy) industry in Northwest Europe;
• Sustainability of industry and logistics is falling to keep pace with laws and regulations; if the third railway track (Eemschot-Oberhausen) is not extended in time, capacity problems will arise from 2014/2015 onwards;
• The significant differences in government investments and policy between the various European countries can disrupt a level playing field;
• A labour shortage may pose a threat.

Strengths
• Short distance to the sea, no nautical restrictions for any type of vessel;
• Growth opportunities for containers and industry, due to Maasvlakte 2;
• Presence of very strong players in all market sectors;
• Extremely strong position in tank storage with growth possibilities and trade activities;
• Extremely strong position for large-scale energy generation, due to location, depth, cooling water facilities, etc;
• The Port Authority has a solid financial position, enabling investments;
• The Netherlands has a good tax environment (for corporate tax);
• The Netherlands suffers little from industrial unrest.

Weaknesses
• The hinterland connections require huge improvements in efficiency;
• The container rail market (services, frequencies) is not as well developed as that of the North German ports;
• Road congestion;
• The strong position of (energy) production based on fossil fuels can hinder the transition to more sustainable forms;
• The distance to the Maasvlakte for commuter traffic;
• The perception of the living climate in the Rijnmond region.

Analysis of the competition

Inland waterways

Space to grow

Presence of world's best players

Port Vision 2030

P.13

Port Vision 2030

P.12
2. Trends, estimates and prospects

The starting point of this chapter is the analysis of relevant trends and developments, including their effect on port and industry in Rotterdam. On the basis of these trends, four different economic scenarios were selected and translated into cargo flows for Rotterdam in 2020 and 2030. Finally, two different prospects were outlined for the port and industry, unfeasible dream scenarios of perfect ports, yet inspirational ideals for creating a vision for the port. As the Belgian writer Willem Elsschot once wrote: 'Between dream and deed, laws and practicalities remain'.
In order to set the right course towards 2030, we need to know which trends and developments will be relevant in the coming decades to the development of the port and industry, and what opportunities and dangers they represent for the port of Rotterdam.

1. Shift in balance of the world economy

Power (economy) is shifting towards Asia. In 2003, Asia’s share in global gross added value was 27%. In the early 1980s, this percentage was still something like 20%. Asia’s share is expected to rise to more than 40% in the decades ahead. The high growth rate in Asia is accompanied by highly dynamic economic and social change. Not only China boasts a strongly emerging economy, but also Brazil, Russia, India and Indonesia. Further globalisation and development of the world economy are expected to trigger growth in global freight transport.

_1.Shift in balance of the world economy_

Power (economy) is shifting towards Asia. In 2003, Asia’s share in global gross added value was 27%. In the early 1980s, this percentage was still something like 20%. Asia’s share is expected to rise to more than 40% in the decades ahead. The high growth rate in Asia is accompanied by highly dynamic economic and social change. Not only China boasts a strongly emerging economy, but also Brazil, Russia, India and Indonesia. Further globalisation and development of the world economy are expected to trigger growth in global freight transport.

_Implied for Rotterdam_

This means that the European economy will become more dependent on other economies. The port links Europe with these emerging economies. Cargo shipments via Rotterdam are expected to increase and a growing number of multinationals from emerging economies will want a presence in the port, also for strategic reasons.

2. Impact of scarcity of raw materials on geopolitics

One of the most complex and urgent issues of the 21st century will be the mismatch that will arise between supply and demand in fossil energy resources, ores, water, food and minerals. These raw materials are crucial to our prosperity and well-being. With global economic growth, population growth and climate change, the raw materials processing industry will increasingly face the challenge of price rises, shortages and export restrictions. This scarcity has implications for global geopolitics. International rivalry could come under pressure as states try to secure their raw materials inventories and agricultural land around the world. Partly because of these challenges, industrial production in Europe is set to change. Reduce, Reuse and Recycle are becoming increasingly important for raw materials as well as energy and residual waste flows. High-quality production will become more important than conventional mass-manufacturing industry.

_Implied for Rotterdam_

This means that as far as the production of energy and fuel is concerned, Europe’s independent position is under pressure. A price rise in (fossil) raw materials and rare earth metals will stimulate the European industries to produce more efficiently, make good use of residual materials and reuse materials. This offers the port of Rotterdam opportunities to be involved in activities in the field of reuse of raw materials, which will generate new cargo flows (for the greatest part in containers), but will also cause the import of iron ore in particular to decline.

3. The development of the labour market and the knowledge economy

While in the coming years employment in and around the port will increase, not enough young people opt for an education in logistics, transportation or technology. Competition for skilled employees is increasing and as a result the (port) labour market will further internationalise in the next few years. The Dutch economy will increasingly be based on the basis of production and labour costs. At the same time, internet and other digital means of communication will make the sharing of knowledge a common phenomenon. In general, there is a wide support for the port, but citizens are increasingly better informed about specific activities and are often critical about the disruption caused by the port.

_Implied for Rotterdam_

This means that knowledge and innovation will become increasingly dominant factors in determining the competitive strength of the Netherlands. As a result of this trend, the relationships between business, government and educational institutions in Rotterdam need to be strengthened in order to produce a dynamic
Rare earth materials

These days, the newspapers frequently report on international tensions over rare earth minerals, such as praseodymium. Historically, five years ago, China has rapidly reduced export quotas for a number of rare earth minerals. By the middle of the decade, a complete ban is planned on the export of materials such as dysprosium, terbium, thorium and lutetium. China used such high-tech products such as cameras, television screens and lighting for electric vehicles. Ninety percent of all global reserves of rare earth minerals are found in the Chinese province of Inner Mongolia. China then has the largest reserve of rare earth material (REM) in the world. Securing access to these and other strategic minerals is becoming increasingly important for European industries.

For years, China’s dominance led to a large proportion of REM in the Rotterdam. The American lead has fallen dramatically since the late 1990s, as the extraction area (the Mountain Pass province in Inner Mongolia). China thus has the largest reserve of rare earth materials are found in the Chinese province of Inner Mongolia. China then has the largest reserve of rare earth material (REM) in the world. Securing access to these and other strategic minerals is becoming increasingly important for European industries. In the last five years, China planned on the export of materials such as dysprosium, terbium, thulium, lutetium and yttrium, materials used in high-tech products such as cameras, television screens and lighting for electric vehicles. Ninety percent of all global reserves of rare earth minerals are found in the Chinese province of Inner Mongolia. China then has the largest reserve of rare earth material (REM) in the world. Securing access to these and other strategic minerals is becoming increasingly important for European industries.

1. Port Vision 2030

- Labour market. This particularly applies at the higher vocational and professional levels of education. It is becoming increasingly important to invest in (young) technological knowledge and encourage young people to pursue a career in the port. The current interrelation between high (youth) unemployment in the south of Rotterdam and the increasing number of jobs in the port is a major social challenge. In addition, efforts to reduce disruption will become an important precondition for maintaining public support for the port, especially in these areas where economic activity is increasing. Transparency and reliability are key concepts here.

2. Increase in the scale of transport

The past few years have witnessed a further increase in the size of ships, aircraft and trucks. This increase in scale is expected to continue in the next few years. Today, container ships with a capacity of 15,000 TEU are operational, vessels with a capacity of 18,000 TEU are on order and 20,000 TEU ships are under construction. Such large vessels can only call at a limited number of ports.

3. Implications for Rotterdam

Implications for Rotterdam

Large ships require more depth, wider docks, stronger quays and larger cranes. This trend offers Rotterdam opportunities to further strengthen its European function and even expand into a hub for intercontinental cargo flows.

4. Integration of supply chains

In the coming years, more and better insight into inventory status and transport flows will help companies to further optimise their supply chains and make them more flexible. In addition, more attention will be paid to the route of raw materials, which will make return flows more important. Finally, another important development will be to reduce the carbon footprint of supply chains and make them transparent. Shippers are making higher demands on logistics service providers, for instance by including sustainability criteria in the tender process.

5. Climate change and sustainability

In the future, climate change will lead to extreme weather events such as droughts and floods. This may result in periods of low water in the rivers. Sustainability becomes increasingly important, not only from a climatic point of view: more and more consumers are concerned about global warming when choosing products. More and more companies use sustainability to distinguish themselves from their rivals.

6. Implications for Rotterdam

The increased transport capacity of port Rotterdam to distinguish itself as a sustainable port. But port industry actors and intermodal supply chains will need to accept the changes. Ports need to work harder to reduce their environmental impact. Port industry actors and intermodal supply chains will need to accept the changes. Ports need to work harder to reduce their environmental impact.

7. ICT applications

Information technology has a growing influence on everyday life. Exchanging data between devices, networks and systems will become even more comprehensive and user-friendly. The use of ICT in the port becomes even more widespread. The port of Rotterdam is one of the largest ICT hubs in the world. ICT applications are making themselves present in various areas in the port of Rotterdam. ICT applications are making themselves present in various areas in the port of Rotterdam.

8. Changing energy and fuel mix in Europe

The energy and fuel mix in Europe will change dramatically. The share of renewable energy is increasing, biofuels will be used as transportation fuels, and local energy generation becomes more important.

9. Implications for Rotterdam

Rotterdam can position itself as a key player in the energy transition. In the future, climate change will lead to extreme weather events such as droughts and floods. This may result in periods of low water in the rivers. Sustainability becomes increasingly important, not only from a climatic point of view: more and more consumers are concerned about global warming when choosing products. More and more companies use sustainability to distinguish themselves from their rivals.
The most influential factors in forecasting cargo flows are economic growth, the volume of world trade, oil prices and environmental policy. Based on these factors, four different economic scenarios were selected to assess future developments in cargo handling. These scenarios were drawn up by the CPB Netherlands Bureau for Economic Policy Analysis and the European Commission. They are:

- **Low Growth**: low economic growth and low oil prices, fossil fuels remain dominant and environmental policy is moderate.
- **European Trend**: existing policy and moderate economic growth.
- **Global Economy**: further globalisation combined with low oil prices leading to high economic growth and moderate environmental policy.
- **High Oil Price**: high oil prices, a strict environmental policy, moderate economic growth and a relatively rapid increase in the sustainability of industry and logistics.

These four scenarios were translated into future cargo flows for the Hamburg-Le Havre range (HLH range) and the market share Rotterdam can acquire within that range. The results were also compared to the expectations of a large number of clients, knowledge institutions and stakeholders. The estimates do not include cargo for which no specific investments have been made as yet, such as CO2, hydrogen or fresh water.

**Forecasts of throughput**

Four different scenarios were used to forecast the potential cargo throughput in 2030.

- **Global Economy scenario**: crude oil throughput increases slightly. In the other three scenarios, there is a decline. The amount of crude oil handled is determined mainly by the refining capacity in Northwest Europe and the development of alternative energy sources. The decline is sharpest in Low Growth, in which low economic growth causes the market to shrink. In the High Oil Price scenario too, there is a small decline, but this is due to high oil price spanning many more alternatives. This is reflected in an increase in chemical products, mineral oil products and vegetable oils, depending on the raw material of choice.

Rotterdam’s position in liquid bulk remains strong: the hub position for crude oil remains intact thanks to the existing pipeline network (to Antwerp, Moerdijk and the Ruhr, among other places) combined with the depth and storage capacity in Rotterdam. Mineral oil products have the greatest growth potential.

**Dry bulk**

Up to 2030, the increase in dry bulk throughput will be limited or will fall sharply (High Oil Price and Low Growth). In all scenarios, the main decline will be in the handling of iron ore, which is directly associated with blast furnace capacity in Northwest Europe.

### Forecasts of throughput

<table>
<thead>
<tr>
<th>Scenario</th>
<th>2030 Throughput (million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Growth</td>
<td>575</td>
</tr>
<tr>
<td>European Trend</td>
<td>650</td>
</tr>
<tr>
<td>Global Economy</td>
<td>750</td>
</tr>
<tr>
<td>High Oil Price</td>
<td>475</td>
</tr>
</tbody>
</table>
in Northwest Europe, where it is processed into steel. Due to global overcapacity, relatively high costs and outdated facilities, a number of blast furnaces in Northwest Europe are expected to close down. In the EU, only those blast furnaces that can produce economically and cleanly will continue operating in the long term. Furthermore, blast furnaces or those located further inland will disappear. Depending on the scenario, European blast furnaces will close sooner or later. In the Global Economy scenario, blast furnaces will remain operational in the long term. Outdated blast furnaces that can produce economically and cleanly will continue to operate, whereas in the High Oil Price scenario, almost all blast furnaces will end up closing, leading to the greatest decline in iron ore throughput. Coking coal is needed to heat ore in blast furnaces, so the decline in coking coal shipping will be proportional to the decline in steel production. An European steel consumption increasing, the import of steel will increase, if the export options are decreased.


total throughput in 2030

Coal throughput will increase between now and 2020 with the arrival of new coal plants, but will then stabilize in the Global Economy and European Trend scenario and decline in High Oil Price and Low Growth. In the High Oil Price scenario, successful ventures are made into alternative energy sources. In Low Growth, energy consumption rises little or not at all compared to 2008, but efforts are made towards energy savings and energy efficiency.

Throughput figures for other dry bulk (building materials, industrial minerals, ores and concentrates) and agribulk are expected to remain broadly stable in Global Economy and European Trend and fall in High Oil Price and Low Growth. The transhipment of dry bulk in a real growth market, naturally showing the biggest increase in High Oil Price.

_Containers and other general cargo_ In all scenarios, container handling a significant growth market for Rotterdam. Rotterdam has the ability to facilitate maximum growth potential, particularly when intercontinental container flows in Rotterdam (Direct Deep Sea and Transhipment) will grow faster than container throughput. Total throughput is up in all scenarios, but not for all types of cargo in every scenario. Container throughput is increasing the fastest. Coal throughput will also rise considerably until 2020, due to an increase in electricity production. LNG, mineral oil products, biomass and steel are also growth markets. Crude oil and iron ore remain stable, at best. The forecasts show a shift in focus from handling raw materials to semi-finished and finished products.

_Conclusion_ Total throughput is up in all scenarios, but not for all types of cargo in every scenario. Container throughput is increasing the fastest. Coal throughput will also rise considerably until 2020, due to an increase in electricity production. LNG, mineral oil products, biomass and steel are also growth markets. Crude oil and iron ore remain stable, at best. The forecasts show a shift in focus from handling raw materials to semi-finished and finished products.

More information and an objective analysis of the forecasts can be found at www.portofrotterdam.com/port compass, in the document 'Forecasts of throughput’/‘Forecasts cargo traffic’.
In the future, supply chain thinking will have been perfected. ICT is an important boost for skilled employment. Physical port processes have been automated as much as possible. Containers dominate the port. High-speed cargo transits via inland hubs. Flexibly deployable floating docks provide an extra dimension to high-speed logistics. Bulk is also always on the move. Coal, ores, biomass and liquid bulk are shipped straight on to locations in the hinterland. Eighty percent of transport on the continent is by rail and inland waterway. Empty transport is history. Road transport is limited to the immediate vicinity of Rotterdam and only by electrically powered trucks. Thanks to careful (spatial) planning, the region, city and port have become one of the most desirable international locations. The Waalhaven has been partially filled in and now houses the headquarters of logistics giants from all over the world.

You can read the complete versions of these future prospect scenarios at www.portofrotterdam.com/portcompass, in the document ‘Future prospects 2030+’.

2.3 Future prospects

In 2030, industry in Rotterdam is a global showcase for innovation and added value. There is a strong emphasis on the development of a bio-based economy. From the Waalhaven to the North Sea, the port breathes clean industry. At the Maasvlakte campus, universities join forces and start-up businesses flourish. The refineries have been transformed into high-tech industrial parks. Hydrogen production is the new money-spinner.

A new syngas cluster has been built on Maasvlakte 2. Energy-efficient closed cycle and industrial recycling are commonplace, as well as co-working. Rotterdam’s industries are cross-linked through an intricate pipeline network and form one large cluster with those in Antwerp. Coal plants are fully equipped to capture and store carbon. From everywhere liquid CO₂ is transported to the port by pipeline and by ship. Almost every roof has solar panels. Three LNG terminals form a solid foundation for the Netherlands’ role as a gas hub. Surrounding these LNG terminals, there is a cluster of companies that actively use the extreme cold of liquid LNG. Due to the reduced environmental pollution, limited cargo handling has returned to the centre of Rotterdam. The region, the city and the port are extremely popular among international businesses wishing to establish a base. Super-efficient land use means the demand for space can still be met.

You can read the complete versions of these future prospect scenarios at www.portofrotterdam.com/portcompass, in the document ‘Future prospects 2030+’.
The trends and forecasts for cargo throughput indicate the range within which the port is expected to develop in the next few years. The prospects present two extreme pictures of the future for the port. The port of Rotterdam is very important for the prosperity and economic position of the region, the Netherlands and Northwest Europe. Oil, coal, ore and other commodities which enter Europe through the port of Rotterdam are important for the supply of energy and the production of fuels, steel and consumer goods. In addition, all manner of products for the corporate and consumer markets are imported and exported through the port.

Therefore, the vision for the future must contribute towards maintaining and enhancing the prosperity and economic position of the region, the Netherlands and Europe. On the basis of the trends and forecasts, the vision must meet the following requirements:

**Flexible & robust**

The future is inherently uncertain. Social, economic and technical developments are increasing in pace. The port must therefore be able to respond swiftly and flexibly to changing circumstances. In that sense, the vision must be robust. In order to offer entrepreneurs, authorities and citizens a long-term perspective, the vision must be able to cope with the developments, growth rates and growth directions outlined above. Robust also means that the vision should not adopt a one-track approach, but match the strengths of the port complex, the combination of logistics and industry, and utilise and strengthen them.

**Efficient & reliable**

Production and supply chains have to be as efficient as possible to cope with increasing competition from other industrial centres and ports. As production, logistics and transport become increasingly efficient and are scheduled more tightly, the reliability of infrastructure and (utilities) facilities becomes even more important. The balance between quality, cost and speed is what it is about.

**Sustainable & innovative**

Climate change makes it imperative to reduce greenhouse gas emissions. The port and industrial complex is of strategic value for Northwest Europe, but a nuisance to residents in the Rijnmond region. The responsible use of natural resources and the environment is a prerequisite for a future-proof port. Without innovation, the port cannot meet the huge challenge of transitioning it faces. In the future, the Netherlands will find it increasingly difficult to compete on the basis of traditional production factors such as wages and energy costs. Knowledge and innovation are going to be of vital importance.

European economic growth is lagging behind the rest of the world, and Europe is ageing. Europe is falling behind. The administrative overload, the lack of purpose, the lengthy procedures and the bureaucracy associated with (spatial) development do not exactly contribute to the renewal and acceleration required. Therefore, the vision for the port of Rotterdam and industry in 2030 must be, above all, ambitious.
The trends and forecasts for the cargo flows in the previous chapter present the range of possible developments and growth potential for the port. The past has shown that a multifaceted port is able to respond well to changing circumstances. Companies provide each other with goods and services, reinforcing each other’s strengths. The existence of different commercial activities increases the competitiveness of both the port as a whole and the individual companies.

Focusing on a complete port with strong logistics and industrial functions will strengthen the foundations of Rotterdam’s port and industrial complex, and will enable Rotterdam to respond flexibly to changing circumstances. That’s why the vision consists of two concepts: Global Hub and Europe’s Industrial Cluster.

A set of strategic choices have been made in this vision. At the highest level of abstraction, the choice is to focus completely on both logistics and industry. At a lower level, this choice has been translated into eleven characteristics of the Global Hub and Europe’s Industrial Cluster. These characteristics will be outlined in the following sections.

Attention must be paid not only to the port and industry and their impact on the environment, but also to the quality of that environment itself. In the 1990s, government agencies, NGOs and the Port Authority made agreements about a dual objective: investing in both the economy and the quality of life. Now it is important to make new agreements and breathe new life into the concept of a dual objective. The development of logistics and industry (growth and sustainability) goes hand in hand with a quality boost for the living environment and nature.

In 2030, Rotterdam is Europe’s major port and industrial complex. It is a strong combination of the Global Hub and Europe’s Industrial Cluster, both leading in efficiency and sustainability.

Rotterdam is closely linked to industrial and logistics hubs in Northwest Europe. Leading companies invest long term in the most modern facilities. Close partnerships between businesses, government agencies and knowledge institutions lead to a high-quality labour market and living environment, and excellent accessibility. Adaptability is the keyword. So, the complex continues to be an important cornerstone for the welfare of the region, the Netherlands and Europe on to 2030.

_3_ Port and industry in 2030: Global Hub & Europe’s Industrial Cluster

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In 2011, Rotterdam is an attractive hub for all cargo flows. The port can handle the largest ships, has the capacity to handle and store massive quantities of diverse cargo and is linked to a large array of hinterland destinations, accessible by road, inland waterway, rail and pipeline. Furthermore, Rotterdam is a very reliable and safe port, where ship owners can buy their shipping fuel cheaply. This hub function has made the port a market leader for decades. Rotterdam has become Europe’s biggest port for containers and both liquid and dry bulk.

By responding to trends and developments, Rotterdam can strengthen its position as the premier Global Hub in 2030 even further for both existing and new types of cargo. The port of Rotterdam will continue to expand and compete with its competitors in the period its market share increases.

The strategic value of that the Global Hub creates is evident. Companies and consumers have relatively fast, transparent and reliable access to overseas markets and are able to enter them easily. Within the main trading regions that profit directly from the port’s hub function, the strategic value is particularly evident at the national and European level.

Characteristics

In 2030, the Global Hub will have the following five characteristics:

1. Global and intra-European cargo flows

In 2030, Rotterdam will be the Global Hub for container, fuel and energy flows, both existing and new sectors. Depending on the specific market sector, Rotterdam aims to maintain, strengthen or expand its position. Rotterdam is a major storage and distribution location for intercontinental flows of crude oil, mineral oil products, coal and ores. The Global Hub also has an important role to play in intercontinental container transport to and from Europe. Moreover, in 2030 Rotterdam will also be a hub for container flows between other continents, for instance container flows between Asia and the United States, via Rotterdam. Rotterdam will also attract inter-European cargo flows. Due to the size of the flows and the quality of Rotterdam’s connections, the port will serve as a distribution point in the transport of cargo within Europe. As a Global Hub in 2030, Rotterdam will also have acquired a strong position in the handling and storage of new cargo sectors such as CO₂, UNX and biomass.

2. Chain efficiency

In 2030, the Global Hub will be one of the world’s largest hubs for supply chains and networks. Rotterdam will be the pivot in a global logistics network, providing transparent and reliable access to many destinations using different modes of transport. European freight forwarders are serviced synchronously through Rotterdam, which means there is a choice of transport modes and it is possible to split delivery among them. There are only limited ‘last mile’ challenges for substantial expansion of the transport infrastructure, and this expansion is undertaken anyway, because of the high costs and negative local impact, an organisation is needed that focuses on the efficient use of transport. The total chain costs for Global Hub users must also be kept to a minimum.

In order to achieve this efficiency, the various elements of the international supply chains and networks (such as hinterland terminals, sea terminals and hinterland transport) have been further integrated into one coherent, coordinated system by 2030. The information flows between all parties involved in the chain are organised in the best possible way for the purpose. The supply chain running through Rotterdam is the most efficient in the world, which in part accounts for there having the smallest ecological footprint per tonne-kilometre.

Rotterdam’s synchromodal and reliable transport, low supply chain costs and economies of scale offer its clients a major competitive advantage.

 Customers of customers

The shipping companies and the terminal operator in container shipping fundamentally depend on the key players in the port. However, in recent years, forwarders, as logistics service providers, have become more involved. This is reflected in the number of contracts directly controlled by the shipping companies (so-called ‘carrier bookings’) to 50-70% from 20-30% in the past. Moreover, in recent years, forwarders, as logistics service providers, have become more involved. This is reflected in the number of contracts directly controlled by the shipping companies (so-called ‘carrier bookings’) to 50-70% from 20-30% in the past. Not long ago, shippers (or both) were more or less invisible to the port. (Large) shippers are increasingly having their mark on the supply chain. The driving forces being efficiency, cost and value added. Shippers want to cut transport costs and improve the quality and cost of the complete supply chain, not just the transportation element. They look into the full visibility and responsiveness of the chain and optimise the entire process. In order to win contracts, ports and terminals will compete for position in the positioning of their position in the supply chain as a whole. In the future, Rotterdam will therefore have to compete on cost-effective transport and supply chains and live on natural advantages such as geographical location.

More and more shippers are reducing the carbon footprint of their operations, also taking into account the footprint of the entire chain. In order to ‘green’ the chain, they opt increasingly for cleaner ports and cleaner modes of transport. This means, for example, an increase in intermodal transport by inland waterway and rail, but also showing more power to the final destination. Not long ago, the port of Rotterdam was in second position, but must actually focus on greening the port and its logistics processes.

Global Hub Vision

“In 2030, Rotterdam is the leading European hub for global and intra-European cargo flows. It is Europe’s Global Hub for containers, fuel and energy flows. With the hinterland, Rotterdam forms an integrated network. Rotterdam is a frontrunner in sustainable and efficient chains.”
Freight flows at the hub in 2011 and 2030

Rotterdam is already an important hub for a number of cargo flows:

- **Containers**
  - Rotterdam is the main container hub in Europe. Containers destined for Ireland, Scotland, Iceland, Northern Spain, Greece to Scandinavia find their way via Rotterdam. Most containers handled in Rotterdam have a continental origin.
  - Rotterdam is also a short-sea hub: cargo transported from ports in the North Sea to destinations in Western Europe are supplied via Rotterdam. Rotterdam owes this position to Rotterdam’s status as the biggest port and good hinterland connections. The port has a good location at the mouth of the Meuse, which makes Rotterdam’s position on the river Frisian North Sea of great importance as a result of increasing trade volumes.

- **Mineral oil products**
  - In the HLH range, Rotterdam has a share of 3% in the transport of mineral oil products in Northwest Europe and is applied via Rotterdam. Most of these products are transported to big sea-going ships.
  - In the future, this position is expected to increase because the number of big sea-going ships is expected to rise.

- **Coal**
  - The EEMS range, which consists of a number of inland hubs, from where coal is transported to smaller intermodal terminals, will develop into a major hub for coal.
  - Inland hubs, from where cargo is transported, are being planned in Antwerp, in Zeebrugge, and Alphen aan den Rijn and Alblasserdam (transfer hub). In 2030, the port will have an extensive network covering the European hinterland. The Global Hub not only links up with inland hubs, but also reduces the time it takes to move cargo.

- **Biomass**
  - Biomass includes products such as wood, woodchips, and wood-based materials.
  - Biomass has many applications such as the production of biofuels.
  - Biomass can be locally captured or transported from other regions.
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- **CO2**
  - CO2 emissions and is responsible for the problem of fine dust emissions.
  - In 2011, ports have not yet formed any highly integrated global networks. Also, the different global terminal operators work relatively independent of each other.
  - A number of developments can be expected in the area such as stronger relations between hub and border ports through the integration of information systems and increased information sharing in the area of customs, and enhanced cooperation in the area of joint development of regional terminal operators. For example, the Port of Rotterdam Authority’s ambition to become a partner for port development in a limited number of ports in growing markets, as is already the case with Oman. The Port of Rotterdam Authority’s ambition to become a partner for port development in growing markets, as is already the case with Oman.

A stimulating factor for the creation of port networks is the Port of Rotterdam Authority’s ambition to become a partner for port development in a limited number of ports in growing markets, as is already the case with Oman. This too will contribute to the improved integration of port networks and increase Rotterdam’s connectivity with emerging markets.

3. Sustainable hub

In 2030, the Global Hub will be part of the most significant sustainable supply chains with the smallest ecological footprint per tonne-kilometer in the world. In 2011, transport is one of the main culprits when it comes to CO2 emissions, and it is responsible for the problem of fine dust emissions. This situation will have changed in 2030, at least in Rotterdam. Rotterdam will have itself apart by being more sustainable and will strive to be the first to operate by 2030. In 2030, sustainability performance will have improved in all modes of transport, thanks partly to the use of alternative fuels. Hence, for inland shipping, the model to be expected in the future is a mix of rail and inland transport will have taken place from rail to road as a cleaner mode.

The switch to LNG as a shipping fuel and the introduction of dedicated shuttles. Hub ports such as Rotterdam and Antwerp.

3. High-end activities in the region

The Global Hub generates a lot of jobs, ranging from truck drivers and crane operators to ICT specialists and commercial managers. The Global Hub attracts many commercial firms. In 2030, the Hub will have developed into a global hub that contributes to the improved integration of the City and port economies in Rotterdam. The measures needed to build the future Global Hub are discussed in chapter 4.

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Port Vision 2030

Port networks
At present, in 2011, Rotterdam is the electricity hub of Northwest Europe and the largest petrochemical industrial complex in Europe. In order to maintain its position, ensure that the volume of production increases and to compete successfully with industrial clusters in other parts of the world, the Rotterdam complex will have to change in a number of areas by 2030.

**Characteristics**

By 2030, Europe’s Industrial Cluster has the following six characteristics:

1. **Integrating businesses**

   Through scale, diversity and innovative strength, Europe’s Industrial Cluster can offer great potential for further integration. Even more than in 2011, companies exchange raw materials, heat and residual products through co-siting, thus cutting their costs. Constructing more pipelines between businesses and terminals facilitates comprehensive supply chain integration. Companies can exchange heat and steam through a pipe network and reduce their energy costs and CO₂ emissions. In 2030, residual heat is almost completely utilised by supplying it to urban areas and the greenhouses in the Greenport, among other uses. An extensive infrastructure is in place for all possible utilities (from water to industrial gases). This means their pricing is favourable and there is a high degree of supply reliability and low environmental impact.

2. **Connections between regional complexes**

   The Rotterdam industrial complex is competing to an increasing extent with similar complexes elsewhere in the world. This requires further optimisation of supply chains and cost cutting. In order to achieve this, Rotterdam’s industrial complex will have integrated with industries in Antwerp, Moerdijk, Terneuzen and Flushing by 2030, effectively creating one big, world-leading petrochemical complex: Europe’s Industrial Cluster.

   More interconnecting pipelines will have been built for that purpose, ensuring competitive advantages for businesses within the cluster. They can produce more efficiently than their counterparts in other less integrated industrial areas. This stimulates renewal and innovation.

3. **Diversifying and increasing sustainability of energy generation**

   Due to the increasing scarcity of fossil fuels in the future, it is important to diversify energy generation. Focusing on a transition towards sustainable energy, in this way, the energy needs of industry can be safeguarded and the complex can contribute significantly towards energy security in Northwest Europe.

   This means that, in addition to current energy production through natural gas and coal, investments are made for the generation of energy based on other energy carriers such as LNG supplied from overseas, wind, biomass and the sun. The construction of a huge wind farm on the Maasvlakte 2 is part of this plan and will double the port’s available wind energy capacity to 300 MW by 2014. Using biomass for co-firing in existing and new coal-fired power plants will reduce the carbon footprint of power stations. Biomass is not only a new goods flow for Rotterdam, but also for coal-fired power plants in the hinterland, making Rotterdam the European hub for biomass in 2030.

   The port and industrial complex also offers opportunities for solar energy. Covering a net total surface area of 3,500 hectares, the roofs of the industrial compounds offer ample space for large-scale energy generation using solar panels.

   Increasing the energy efficiency of the port and industrial complex, combined with the use of cleaner and more sustainable energy sources, results in lower CO₂ emissions in the atmosphere. On top of this, the port has supplied CO₂ to the Greenport’s greenhouse industry since 2005, and continues to search for new outlets.

   **Port Vision 2030**

   - In 2030, Rotterdam’s industrial and energy complex functions as an integrated cluster with Antwerp, making it the largest, most modern and sustainable petrochemical and energy complex in Europe.
   - This complex competes on a global scale, thanks to its major cluster advantages, integrated supply chains and energy efficiency. The transition to sustainable energy generation and bio-based chemicals is in full swing.
As well as energy transition and energy efficiency, further reductions in CO₂ emissions are also necessary. Large-scale carbon capture and storage (CCS) is absolutely essential. In 2030, an open infrastructure for carbon transport and storage, and a new carbon capture/transportment terminal will have been built. The carbon capture and storage processing industries will be transported to empty offshore gas and oil fields for permanent storage. Carbon captured from other industrial complexes will also be transported to these offshore storage sites via Rotterdam.

Electricity is generated on an increasing number of locations in the port and in various ways. That’s why the port needs ‘smart grids’, so that supply and demand of electric energy can be better coordinated.

4. Producing clean fuels

The refinery sector in Northwest Europe undergoes rationalisation in the years leading up to 2030. Thanks to the scale and easy access to the markets, the Rotterdam refinery sector occupies a relatively strong position in this process. It is able to attract a chunk of the European refinery market, while rationalisation elsewhere will also play its part in halving CO₂ emissions by 2025.

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6. High-end activities in the region

Following the transition of industries, a new market emerges in Rotterdam for specialised support service companies, industrial service providers and inspection agencies. The port is also home to specialised chemical industries based on sustainable semi-finished products and the reuse of chemical waste, sludge and the like. The developments in Europe’s Industrial Cluster in the areas of bio-based chemicals, energy reduction, energy transition and CO₂ technologies boost innovation (research as well as development) and give rise to new, future-oriented knowledge networks, in line with the Clean Tech Delta programme. As a result of new bio-based product flows, new trade flows emerge, with accompanying trading activities and the establishment of commercial offices.
The global trends and the throughput forecasts outlined in Chapter 2 were translated into a vision for the port in Chapter 3: the Global Hub and Europe’s Industrial Cluster. Our ability to turn this vision into reality depends on two factors: our own efforts (businesses, governmental agencies, stakeholders, Port Authority) and developments in the world economy, translated into forecasts of cargo flows. It’s impossible to choose one of the scenarios presented in Chapter 2, but it is possible to prepare for the opportunities they present by creating the necessary preconditions. There lies the task: basically, to ensure that both port and industry continue to promote prosperity.

The vitality and the comparative advantages of the Rotterdam complex, such as geographic location, hinterland connections, capacity and diversity, are important factors. Several of the trends and developments outlined in Chapter 2 are to the benefit of Rotterdam. In addition, the city and its port have always had pride, self-confidence and an entrepreneurial mindset. And, as history has shown, it is possible for a port to diversify if its business model changes due to the collapse of one sector, such as the steel industry in the 1990s. On the one hand, sea-to-sea cargo flows account for the majority of Rotterdam’s throughput and there is currently very little demand, such as crude oil, coal, iron ore, iron and steel. On the other hand, Rotterdam as a new materials hub could attract completely new flows which were not included in the forecasts, such as fresh water, CO₂ and hydrogen. There is a lot of uncertainty surrounding such flows. As yet unknown opportunities for attracting new cargo flows and economic activities might not have been anticipated yet. In 2010, throughput was already 430 million tonnes, while two new container terminals, an LNG terminal, two coal-biomass power plants and additional tank storage are all under construction and will start to generate extra throughput within a few years. According to current expectations, total throughput will reach the 500 million tonne mark by 2015. The Port Authority and the port business community are convinced that the port should prepare for throughput of 675 to 750 million tonnes in 2030.

Creating capacity for the increase in throughput is certainly not the only challenge. The Vision already mentioned the transition of industry and the creation of a fast, reliable, efficient and sustainable logistics system. The physical space to realise these plans is limited. Maasvlakte 2 will mark the boundary of the port and industrial area, at least for the next two decades, and environmental standards will only become stricter in the future. The road network, in particular, is inadequate in some areas. It also needs to be used more efficiently if the aforementioned growth is to be achieved.

Significant effort is needed in various areas. Chapter 4 defines a number of success factors – actions that need to be taken over the coming decades if we are to realise the visions of the Global Hub and Europe’s Industrial Cluster. This chapter will outline these physical and non-physical success factors: the hardware and software of the port. For each success factor, the ambition for 2030 and what needs to be done to achieve this ambition is outlined, based on the situation in 2011. The premise is throughput of 675 to 750 million tonnes. It is essential to monitor the developments and to be flexible in realising the success factors. Flexibility means the ability to accelerate and slow down, to adapt. Flexibility is needed in the use of space and infrastructure, in labour markets and in laws and regulations. The Port Authority also needs to be flexible. This requires mental agility, the ability to innovate and respond.

All too often, the sense of urgency is lacking when it comes to maintaining and strengthening the competitive position of Rotterdam’s port and industry at the European and global level. There is a tendency to focus on the short term rather than the big picture. The sustainability issue and the rapid rise of such economies as China, India, Brazil and Russia, as outlined in Chapter 2, mean that Rotterdam must take steps now to ensure that its port and industry can continue to contribute towards prosperity in the long term too. It isn’t possible to predict how long-term contribution, for example as a percentage of GDP, will grow. The future cannot be predicted with any great accuracy. What does become clear in this chapter, however, is that if the Port Vision is realised, employment will rise (section 4.6), business investments up to 2030 will total between €25 and €35 billion (section 4.1), accessibility of the region will improve (section 4.3) and nuisance to residents will decrease (section 4.5).
4.1 Investment climate

**Ambition:**
Up to 2030, the port of Rotterdam aims to attract €25 to €35 billion in private investments from market leaders.

**Investment climate**

In 2030, the volume of private investments in Rotterdam averaged €1.5 billion per year, with an upward trend. For the next 5 years (2011-2015), the aim is to attract about €2 billion in private investments per year. A rough estimate is €25-35 billion in the period 2011-2030. Foreign Direct Investment (FDI) will account for a lot of this investment. The port complex is a magnet for inward investment. The port’s share in total FDI in the Netherlands was an incredible 18% in the period 2001-2010. It is expected to remain stable at this level. The aim is to attract investment particularly from market leaders.

Actions

1. **Delivering value for money with the Rotterdam ‘port product’**
   - The port has to distinguish itself on efficiency and sustainability. Clients are prepared to pay for these things, but they have to get value for money.
   - Rotterdam may be a bit more expensive than other ports, but the cheapest supply chain from producer to consumer has to run via Rotterdam. This means that costs for the port as well as the service providers, such as tugs, pilots and boatmen, must increase modestly compared to competing ports. The same goes for taxes, such as property tax and other local or council taxes. The availability of utilities (water, electricity, heat, industrial gases and suchlike) is important, especially for industry.

2. **Strengthening partnerships between governmental authorities, businesses and the Port Authority**
   - This is important that governmental authorities speak with one voice and do not make conflicting demands. The partnerships in the fields of safety, sustainability and labour market policies should be intensified.

3. **Strengthening partnerships between inspection agencies and supervisory renewal**
   - Inspections could be carried out more efficiently. The inspection agencies are adopting a position of trust in businesses, rather than distrust. If a business has a proven track record, it will require fewer inspections. If inspections are carried out for the sake of compliance, they will not improve the business climate in Rotterdam.

On a global scale, knowledge and economic activity become increasingly concentrated in so-called global city regions, which form a network connecting mainports. Amsterdam Airport Schiphol and the port of Rotterdam form such a network, reinforcing one other. The dynamic character of transport Schiphol contributes to the investment climate in the port, mainly due to the intercontinental network for business travellers. Partly as a result, it makes it more attractive for international knowledge-intensive activities.
Besides the private investments of around €25 to €35 billion in the period up to 2030, the (central) government and the Port Authority will also be investing heavily. The central government will invest €5 to €6 billion during this period. This money will be used to maintain and expand the infrastructure to maintain accessibility, which is not only important for the port. All other businesses and the public have an interest in this too. In concrete terms, this involves projects such as the widening of the A15 motorway between Maasvlakte and Vaanplein, the construction of a tunnel beneath the Nieuwe Waterweg, the construction of the A4 South, solving the Caland rail bridge bottleneck, increasing the capacity of the Volkerak and Kreekrak locks, solving other inland waterway bottlenecks in the Netherlands, and implementation of the High-Frequency Rail Programme.

The central government is also investing in innovation and increased sustainability, often through incentive schemes and subsidies. The port and industry have much in common, with five of the ten top sectors named by the government as spearheads in its innovation policy. These sectors are energy, logistics, chemicals, water and headquarters.

The major investments by the Municipality of Rotterdam and the other municipalities in the region which contribute to the success of the Port Vision 2030 concern attractive living environments and education. Again, it is not only the port that benefits. It is therefore difficult to allocate these investments directly to the realisation of the Port Vision 2030.

In the period up to 2030, the Port Authority will invest €5 to €6 billion. Around €2 billion of this is earmarked for completing and developing Maasvlakte 2, and €3 to €4 billion for investment in the existing ports of Rotterdam, Dordrecht and Moerdijk. This involves public infrastructure such as roads, docks and berths, and more customer-specific infrastructure such as quays, jetties, pipelines and the restructuring of sites to boost the hinterland network also forms part of this.

4. Favourable fiscal climate and active joint acquisition
   The fiscal climate is of paramount importance for attracting Foreign Direct Investment and trade. Effective cooperation between the Netherlands Foreign Investment Agency (NFIA), the Rotterdam Investment Agency (RIA) and the Port of Rotterdam Authority is also vital. As regards to the acquisition of new business, the central government in particular can play a vital role.

5. Improving effectiveness and speeding up decision making and procedures
   Europe’s economic growth is lagging behind that of the faster growing economies of other continents, such as Asia and South America. Part of the reason for this is the speed with which (administrative) decisions are made in those regions. As the industrial cluster in the port of Rotterdam competes on a global scale, there is a pressing need for more effective and decisive action, less bureaucracy and, consequently, much faster decision making. This includes (fundamental) amendments to laws and regulations. Rotterdam could serve as a pilot here. Also, existing European regulations should not be supplemented by Dutch ones.

6. Swift and predictable dispute resolution
   The Dutch judicial system enjoys a good reputation, as does dispute resolution by arbitration for shipping and transport. There is significant internationally-oriented expertise on hand, procedural law is practical and informal, and there are various options in arbitration. Resolving disputes here is therefore relatively inexpensive, fast and predictable. This aspect of ‘ease of doing business’ is attractive to companies wanting to set up business here and having their legal interests to be taken care of close to home. These qualities can be further strengthened and utilised.

7. A client-oriented, flexible, reliable and result-oriented Port Authority
   In a good investment climate, the Port Authority acts proactively, identifies opportunities and threats and deals with them vigorously, is flexible, places great importance on results, weighs the interests of individual clients and those of the complex as a whole, and is conscientious, fast and reliable.
Land use

4.2

Ambition

The port of Rotterdam wants to provide room for expansion to world-class businesses in containers, fuels and energy. The premise is that this growth will be entirely realised within the existing port area, including Maasvlakte 2, Dordrecht and Moerdijk, ensuring that the construction of Maasvlakte 3 will not be necessary until 2030.

For the Global Hub and Europe’s Industrial Cluster to be a success, land is essential. Existing businesses need the space to expand and new businesses need space to set up. Depending on the scenario, Rotterdam’s throughput will grow to between 473 and 765 million tonnes. As reasoned in the introduction to this chapter, these views anticipate throughputs of 573 and 790 million tonnes in 2030. Maasvlakte 2 will increase the available land for businesses by about 20%. That means, if in 2030, the average throughput per hectare will have to increase by a maximum of 60% to accommodate the expected growth. In choosing a commercial location in the port, the main criteria are an improvement in land use productivity and the efficient use of space. This will also be necessary for expansion of the energy port, the construction of Maasvlakte 3 will ensure that these conditions are met.

Actions

1. Providing space for container growth

The average land use productivity of Rotterdam’s container terminals will have to grow from 20,000 TEU/ha to 30,000 TEU/ha by 2030.

Increasing the land use productivity is optimum marine facilities. That means ample waiting berths for inland vessels and terminals, land use for service providers such as location and hub, and good bunker facilities. To increase terminal productivity, it is crucial that terminals are dispatched quickly to the hinterland. This requires the construction of dedicated inland shipping, rail and feeder vessel facilities. Similar requirements are necessary for extended gates and container transfer points such as the transfer point currently under construction at Alblasserdam. In cooperation with Customs, the transport of containers between various companies and service providers on the Maasvlakte will also be optimised.

2. Room for development in energy and industry

In order to further strengthens and differentiate the Rotterdam energy cluster, the energy cluster on the Maasvlakte will be expanded. The aim is to realise a synthesis gas cluster, carbon capture and storage facilities and a further extension of bio-based industries in this area by 2030. To facilitate these plans, ample space will be reserved and connecting infrastructure such as pipelines will be constructed. To make more efficient use of the available space, there will be transformation facilities for multiple uses. In a more complex, accessible environment energy and employment are taken into account. The need for so-called ‘city business’ premises will be discussed in the section ‘City and Region’.

3. Room for strengthening the Rotterdam Fuel Hub

As the Europoort area will be further developed into the Europoort fuel hub, average throughput per hectares will have to increase sharply.

Ports of the Europoort area are not optimally arranged at the moment. A relatively large number of sites are either undeveloped, underutilized or form strategic reserves for other activities, such as ship-to-ship transfer, but also for land use for service providers such as boatmen and tugs, and good bunker facilities. To increase terminal productivity, it is crucial that terminals are dispatched quickly to the hinterland. This requires the construction of dedicated inland shipping, rail and feeder vessel facilities. Similar requirements are necessary for extended gates and container transfer points such as the transfer point currently under construction at Alblasserdam. In cooperation with Customs, the transport of containers between various companies and service providers on the Maasvlakte will also be optimised.

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The future of the Slufter feedstock for the bio-based industry. Another option would be to use the briny levels of the depot and the sea. A hydroelectric power plant could also be used to produce energy, for instance by exploiting the difference in height between the water in the depot and the water in the sea. So alternative uses for the Slufter are being looked at.

Putting the Slufter to nature-friendly use could compensate for the disappearance of natural habitats in other areas due to economic development. The direct vicinity of the Slufter is an important breeding ground for various species of gulls. It would also only minimise chairman (perhaps in the form of floating bird islands) to establish the depot as a breeding ground.

Finally, the Slufter could also be used as a storage site for cargo. Using the existing water layer is preferable in this scenario. It would be, however, expensive, to partially drain the Slufter. Draining it in too fast could cause problems for the flora and fauna.

1. Sustainable energy generation. In addition to the wind turbines on the dike around the depot, the water in the depot could also be used as a storage site for the surplus of power. The difference in height between the water in the depot and the water in the sea can be used to produce energy by converting the water energy into electricity. An important aspect to consider in the synergy with the surrounding area is the direct vicinity of the Slufter. The difference in height between the Slufter and the surrounding area could be utilized, but merging the Slufter with the neighbouring area on Maasvlakte would also be a possibility. Several alternatives are outlined below.

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The Slufter is a depot on the Maasvlakte for the storage of contaminated slurry. It covers an area of about 250 hectares. The Slufter is around 50% full. It is possible that the Slufter will never fill up completely. The need for storage space for contaminated slurry is decreasing due to great improvements in the water quality of the fluvial and fluvio-marine, which has resulted in a cleaner river bed. In the distant future, the Slufter might be used as a breeding ground for various species of gulls. It would also only minimise chairman (perhaps in the form of floating bird islands) to establish the depot as a breeding ground.

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Dordrecht

Multi-user terminals are a possibility for making better use of the quays and piers in the port. Currently, most of the quays and piers are either owned by one single company. This means that quays and piers are not always used daily. Because not all companies route ships 24/7 in the case of multi-user terminals, several businesses make use of the same quay and unloading facilities, thereby saving them money. What’s more, businesses that do not border the water themselves can make use of multi-user terminals to handle their traffic. Companies that use the quay, the occupancy rates rise.

Note: The text is a summary of the content from Port Vision 2030 and the Dordrecht Development Plan 2030.
Hinterland transport will increase significantly in the years running up to 2030. Ports will become an integral part of the supply chains and networks. In the future, the quality and reliability of the hinterland connections will become even more important to the port of Rotterdam’s competitive position. In order to realise the Global Hub and Europe’s Industrial Cluster, the reliability and quality of the supply chains via Rotterdam will have to improve significantly.

Better port access also means fewer traffic problems for the region’s inhabitants. That is why the entire traffic and transport network must be linked to collaboration and communication with regional governments.

**Accessibility**

In 2030, access to the port and industrial complex is easy and reliable by all four modes of hinterland transport (inland waterway, rail, road and pipeline).

**Actions**

1. **Improving efficiency through alignment and controlling bodies**

Currently, infrastructure and transport are not used to their full potential. During rush hour, the network is overloaded, whereas there is ample capacity at other times. Hinterland transport will continue 24 hours a day. Better planning and optimal alignment within the supply chain can immediately improve the use of trucks, ships, trains, and, as well, the transport infrastructure. To this end, it is important that those involved in the supply chain exchange information and thus avoid unnecessary (empty) transport. In addition, faster interchange between the different modes (synchronous transport) can vastly improve efficiency and accessibility. There is a need for a new form of partnership between the parties involved. It is really up to the business sector to improve efficiency in this way.

Improvements in efficiency also need to be made in the port and industrial area itself. They concern the correct handling of goods and inland vessels. Small quantities of cargo can be bundled via a rail service centre or a barge. The handling of trains and inland vessels. Small quantities of cargo can be bundled via a rail service centre or a barge.

Improvements in efficiency also need to be made in the port. Managing the use of pipelines and pipeline networks would also improve efficiency.

Further development of these controlling bodies is necessary if hinterland chains are to become more efficient through a result-driven, client-oriented approach. These bodies need to be given more powers and more responsibilities. It is important that controlling bodies such as the Traffic Management Company (for road traffic) and Keyrail (for rail) develop their roles further.

In order to improve efficiency via vis-a-vis the hinterland chains, direction and collaboration are essential. Network-wide proactive traffic management is vital for all modes of transport. It is important that controlling bodies such as the Traffic Management Company (for road traffic) and Keyrail (for rail) develop their roles further. The Traffic Management Company must carry out traffic management on the Rotterdam ring road and subsidiary roads. Ideally, the Traffic Management Company would operate under the direction of a future regional traffic authority. Within this set-up, it is essential for the Traffic Management Company to retain its enterprising character. A controlling body for inland shipping must streamline the handling of inland shipping containers in the port. Managing the use of pipelines and pipeline networks would also improve efficiency.

2. **Strengthening the hinterland network**

Inland terminals are increasingly adopting the role of portal to the seaport terminal. They function as extended gates; operations that don’t need to take place in Rotterdam are partly transferred to these terminals. In order to accommodate expected growth, the capacity of the midstream inland terminal network will have to be increased, both by expanding existing terminals and building new ones. The development of so-called transfer points: operations that don’t need to take place in Rotterdam are partly transferred to these terminals. In order to accommodate expected growth, the capacity of the midstream inland terminal network will have to be increased, both by expanding existing terminals and building new ones. The development of so-called transfer

Synchronised transport is an innovative concept in logistics, introduced by the Strategic Platform for Logistics. In the context of the logistics of the separate modes of transport (in terms of information and planning, for instance) are poorly matched. Synchromodal transport means a better alignment between transport volumes and the available modal capacity, and helps in optimising use of the complete range of transport and traffic systems. Synchronised transport also makes it possible to switch quickly from one mode to another, in the event of a disaster or other disruption in the supply chain.

In 2030, access to the port and industrial complex is easy and reliable by all four modes of hinterland transport (inland waterway, rail, road and pipeline).
Improvements in public transport between Vlissingen, Rotterdam and the Rijnland region (also via the new West River Crossing) will be necessary to reduce commuter and recreational traffic on the A15. This will temporarily secure the freight capacity on the railway, the growth in road transport in Rijnmond.

In 2010, the Caland railway bridge will prove to be a bottleneck. The A15: traffic management in 2030...
4.4 Shipping

Ambition:
In 2030, the port of Rotterdam is the world leader in shipping sustainability, efficiency and safety.

Without shipping, there cannot be a successful Global Hub or Europe’s Industrial Cluster. Throughput will increase in the future, as will the size of ships. Ocean shipping, inland shipping and service providers must become more efficient, the environmental impact of shipping must be reduced and nautical safety must remain guaranteed. The common thread here is the integration of information and the more centralised planning of shipping movements, in line with the drive to improve the efficiency of logistical processes in the port itself. In these efforts, efficiency, sustainability and safety are often part of the same process.

**Actions**

1. **Improving efficiency in handling sea-going and inland vessels**
   In 2030, the improved handling of ships will result in faster turnaround times, reducing chain costs and making Rotterdam a more attractive hub. In 2011, both feeders and inland vessels frequently have to wait to be handled at the terminals. Often they also have to visit a number of different terminals. Planning the use of infrastructure and ships’ visits must therefore be improved.

   The best way to improve efficiency in handling ships is through extensive data exchange between ship owners, (inland) terminals, marine service providers and the (National) Harbour Master. This would minimise waiting times and optimise cruising speeds. AIS, a system for determining the position and course of ships, could assist in this task.

   With the integration of the ports of Rotterdam, Dordrecht and Moerdijk, it is logical that, in future, the (National) Harbour Master will be responsible for traffic management and incident control on the water from the Rotterdam roadstead to Moerdijk. However, the data exchange extends far beyond the Rotterdam region. Inland shipping movement deep into Germany are covered, and ocean shipping is directed by the (State) Harbour Master from Gibraltar in order to optimise the cruising speeds of ships bound for Rotterdam.

   Better planning leads to:
   - Financial benefits for ship owners who can reduce speeds to arrive at the terminal exactly on time (instead of arriving too early and having to wait);
   - Reduction of CO₂ emissions, fine particles and other hazardous substances;
   - Financial benefits for marine service providers (pilots, tugs, boatmen), as they are able to improve their capacity planning;
   - Financial benefits for the terminals, as they are able to improve their capacity planning.

   The Global Hub requires round-the-clock nautical operations under all circumstances. In 2030, long-stay berths for inland vessels will not be needed for the area west of the Benelux tunnel. A few waiting berths will be available. In order to moor ships quickly and safely also in bad weather, new mooring technologies are desirable.

   **New mooring technologies**

   Mooring ships with lines and bollards is a technique that goes back to the earliest days of shipping. In recent years, new technologies have been developed which may soon see a revolution in mooring. The first of these is a mooring system that allows the creation of mooring lines automatically to the tide and ship’s load. This reduces the chances of lines snapping. The system is currently being tested at one of the container terminals in Rotterdam. The second technology is an Electromagnetic Mooring System (EMS). Mooring with lines and bollards takes time and the work of the boatmen (the people who take the dock lines up to the quay) is not without danger. Using this electromagnetic system, the ship can be moored quickly and with engines switched off. This means less disturbance of the water bed, as well as a reduction in fine particle emissions and noise. Electromagnetic mooring also has advantages for the stability of the ship. This means that loading and unloading are faster and safer.
### 2. Safety

Integral planning of all shipping movements is an important tool for improving the safety of shipping traffic. The (State) Harbour Master can reduce the risk of incidents by further standardising procedures and communicating clearly with crews. This includes introducing English as the official language in both ocean and inland shipping.

Improving shipping safety calls for alignment between the technical tools for supervising shipping used on the Dordtse Kil and the Hollandsch Diep (approach to Maerdijk) and those employed in the Rhine-Maas area. Expansion of the radar cover by placing cameras or using AIS (Automatic Identification System) will make this possible.

Another way to increase safety is by drawing up an international plan for the North Sea, which balances various interests. Demand to use the North Sea is so great and the volume of shipping traffic on its waters so heavy that the various interests have to be balanced through international dialogue. The various issues concerned include the coordination of shipping, oil and gas exploitation, carbon storage, wind turbines, anchorages and possible new shipping routes via the Arctic Ocean.

### Arrival of the Myriam Maersk in 2030

The Myriam Maersk leaves Brazil. All cargo, crew and ship information provided in Brazil is instantly available in Rotterdam. At the Harbour Coordination Centre, they note that the proposed berth at the APM terminal on Maasvlakte 2 will still be occupied by her sister ship, the Madelon Maersk, when she is due to arrive. While the Myriam Maersk is still on the Atlantic Ocean, her captain is advised to adjust the speed in order to save fuel and avoid having to wait on arrival in Rotterdam. All cargo information for the Myriam Maersk was transmitted in one go. Thanks to the streamlined pre-arrival procedure, the pilot knows days in advance when they will board, the tugs know when their assistance will be needed and the LNG bunker vessels will be ready to supply the ship with fuel as soon as she has moored. All communication between the parties involved is obviously in English. The cargo information is organised in such a way that the inspection can be carried out virtually, while the ship is still at sea. The authorities involved coordinate their duties, including pre-arrival inspection of the ship and her schedule. The Myriam Maersk is serviced quickly by dual-hoist cranes. Information on progress at the terminal is available to the maritime partners, so that the ship can leave the moment she has been loaded. Whereas the Emma Maersk used to spend 36 hours in Rotterdam, the Myriam Maersk needs only 24 hours. This means that the Monica Maersk, while entering the Channel at Brest, has been advised to increase her speed slightly because she can be serviced sooner than expected in Rotterdam.
Industry and transport have become considerably cleaner in the last few decades, reducing environmental pollution. Nevertheless, the port still has a big impact on its surroundings. The surrounding area wants a cleaner and quieter port. It is largely up to the port community to grant this wish. Existing agreements between the port community and the surrounding area, such as the Rijmond West noise covenant, will of course be preserved. Light and regulations concerning air quality are expected to become more stringent in the future. At the same time, increasingly scarce resources, climate change and the importance of preserving biodiversity mean that production processes and logistics will have to become more sustainable. We can’t separate concerns for the environment and reduced emissions at the local and global level. Moreover, innovations are needed in these areas to literally make room for the expected increase in activity. In turn, these innovations in sustainable technologies will strengthen the competitive position of the complex. Together, these factors provide great opportunities for the development of the port. Not surprisingly, sustainability is a common thread in this Port Vision, reflected in the trends and developments, and in emissions in the port area itself, notably of fine particles and NOx. In addition, the nuisance (particularly of fine particles and NOx. In addition, the nuisance (particularly of fine particles and NOx). In addition, the nuisance (particularly of fine particles and NOx) suffered by local residents has been reduced and external safety improved (including access/escape routes).

**Ambition:**
In 2030, Rotterdam, including the seaports of Dordrecht and Moerdijk, will be the most sustainable port and industrial area in the world. The quality of life in the surrounding areas will have improved demonstrably. This is thanks to an improvement in the local air quality as a consequence of a reduction in the background levels and in emissions in the port area itself, notably of fine particles and NOx. In addition, the nuisance (particularly from noise and stench) suffered by local residents has been reduced and external safety improved (including access/escape routes).

**Environment, safety, and quality of life**

It will involve tightening existing standards and probably also creating standards for "new" substances or effects. New findings about the effects on health, the availability of improved technologies and social pressures will lead to more stringent environmental legislation, affecting individual companies and the port complex as a whole. It will involve tightening up existing standards and probably also creating standards for "new" substances or effects. The protection of ecological features will be an increasingly big concern. Without far-reaching measures, it will be impossible to achieve substantial growth in throughput and significant intensification of land use. These measures will focus on emissions reduced at source, for instance through lighter-emission standards for inland shipping and using vapour-return systems, which minimise emissions while loading and unloading liquid cargo.

**Actions**

**1. Growth within the limits of (stricter) laws and regulations**

New ideas about the effects on health, the availability of improved technologies and social pressures will lead to more stringent environmental legislation, affecting individual companies and the port complex as a whole. It will involve tightening up existing standards and probably also creating standards for "new" substances or effects. The protection of ecological features will be an increasingly big concern. Without far-reaching measures, it will be impossible to achieve substantial growth in throughput and significant intensification of land use. These measures will focus on emissions reduced at source, for instance through lighter-emission standards for inland shipping and using vapour-return systems, which minimise emissions while loading and unloading liquid cargo.

The distribution of available environmental space (maximum emission) will have to be controlled.

This will allow the efficient use of such space, as well as the optimisation of environmental measures. It is also an effective instrument for controlling central agreements on reductions or tighter laws and regulations to various companies, including the transport sector.

Port and industry, and related cargo transport, have a relatively low impact on local air quality, including the amount of fine particles. The main culprit is road traffic, of which port-related traffic only accounts for a small proportion. The most problematic areas in the region in terms of air quality are those flanking the motorways and the main inner-city roads.

Optimising supply chains through planning and traffic management has a positive effect on traffic emissions: unnecessary (empty) transport is avoided. Modality and type of cargo are coordinated properly.

At the 2030 sustainable port, only the cleanest trucks are welcome, only electric locomotives are used on the port railway, inland vessels have CCR4 engines at the very least, and ocean shipping also uses the cleanest engines (Tier 3). Combustion engines for trucks can hardly be made any cleaner. For example, a EURO VI engine (compulsory since 2000) emits 95% less than a EURO III engine (compulsory for new trucks from 2014) emits 95% less than a EURO III engine (compulsory since 2000). Alternative, clean propulsion technologies are needed for road traffic to reduce air pollution even more. By using alternative fuels for ocean and inland shipping (such as LNG) and optimising sailing times, sometimes in combination with slow steaming for ocean shipping, emissions can be reduced even further.

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**Emissions NOx**

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**Emissions SO2**

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Port Vision 2030
The port is home to a surprising variety of wildlife. From common species such as gulls, moorhens and rabbits to wild horses and free-roaming Highland cattle. Seals and pipistrelle bats can also be found in the area. You can even spot protected species in the port area, such as the natterjack toad and the fen orchid.

But there is also a code of conduct that makes extra demands, which everyone working in the area must adhere to. One year, a survey made of species living in the area, clarifying which species used to be in the area and considering it in the relocation situations.

Nature is the port important for the quality of the surrounding area. The port is a place where people like to work and spend leisure time. The port's primary consideration at the various locations.

In addition, green and recreational areas, especially if it also reduces noise pollution. In order to keep the option of shore-based power open, the new quays at Maasvlakte 2 will be equipped with the necessary facilities.

Thanks to this broad approach, the supply chains with the smallest ecological footprint in the world will be operating via Rotterdam by 2030.

International regulation is key to the most important instrument for reducing emissions in ocean shipping. If regulation fails to produce adequate results quickly enough, the sector will have to be encouraged to take measures through, for example, incentives and differentiation in port dues, such as the Environmental Ship Index. Ships-based power is not a real solution for ocean shipping, because ships will keep polluting at sea and only turn off their generators in port. Shore-based power is a viable option for ferries that visit the port very frequently, or in certain specific local situations involving residential areas; especially, it also reduces noise pollution. In order to keep the option of shore-based power open, existing power stations and equipment to be replaced with the necessary facilities.

To avoid the creation of new nuisance situations, it is important that neighbouring municipalities introduce a buffer zone between residential and business areas.

To avoid the creation of new nuisance situations, it is important that neighbouring municipalities introduce a buffer zone between residential and business areas. Where it is still permissible to build residential properties on environmental grounds, it is important not to use the space, so that the quality of the living environment can improve in the future.

This does not apply to the City Ports (Stadshavens) area. Here, the city and the port are actively looking for the best options.

To realise optimum connections between the city and the port, and to implement the agreed plans outlined in the City Ports structure vision, these areas need tailor-made solutions to combine urban and port functions. When building homes close to industry, you not only get fantastic views, but also the nuisance factor of the port.

In the course of time, the available environmental space will probably be further reduced by new legislation. Whenever possible, it will be used to allow the port to develop within the legal and regulatory framework. At the same time, specific local nuisances in the area surrounding the port should be dealt with as much as possible. This nuisance could be noise, traffic congestion, stretch or dust caused by port activity. These measures, which are above and beyond legal requirements, will be checked for their cost-effectiveness: the cost of reducing nuisance must remain reasonable also in relation to the number of people involved. In addition, green and recreational facilities can be improved to further enhance the quality of the living environment.

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There will be far fewer incidents involving odour nuisance in 2030. This means that businesses will have to invest in processes and facilities that reduce, or even totally eliminate, the probability of odours being released.

Many chemical companies are such other’s (waste) products as feedstock. A good example of this is the cluster around Huntsman. Their intensive collaboration results in polymers. A total of around 250 companies form the cluster around Huntsman. Their intensive collaboration results in higher levels of productivity and stimulates innovation.
Health

The port can contribute to people’s health in three ways. To start with, the port provides a great deal of employment and thus opens up opportunities for people to personal development. The level of education, work and income are essential to health. The way people perceive their environment also affects their health. Nature stimulates people to take exercise and enjoy constructive stress, even just looking at, or being in nature, can be soothing. Information and opportunities for the participation efforts people to healthy living. During the construction of Maasvlakte 2, the

3 Towards a new ‘dual objective’
In 1993 and 2001, governments, NGOs and the Port of Rotterdam Authority entered into the ROM-Rijnmond and ‘Vision & Caring’ covenants. They found that expansion of the port through construction of Maasvlakte 2 was desirable, and realised that something would have to be done in terms of mitigation and compensation. The quality of life in the Rijnmond region also resulted to boost. That resulted in the Rotterdam Mainport Development Project (ROM-Rijnmond) and the construction of Maasvlakte 2, as well as projects such as Quiet port in parts of the port, the construction of river parks in the urban environment and the realisation of an impressive 750-hectare nature and recreation area in the immediate vicinity of the city of Rotterdam. The dual objective also guaranteed a great deal of support for the development of the port. Besides boosting the two tasks involved (expanding within the limits of the land, and dealing with the main residence problems), it is good that governments, NGOs, the business sector and the Port Authority enter into dialogue with each other on how to boost the overall quality of life in the region. Given the strategic role of the Port Compass, that region does not have to be restricted to Rijnmond.

4_Dealing with climate change and biodiversity
A proper strategy
Climate change also has an impact on global biodiversity. This means that the transition to renewable raw materials must be pursued vigorously. In 2030, organic raw materials will be produced sustainably and their certification will be beyond doubt. Clean and renewable energy source will be an important element of electricity production in the port of Rotterdam in 2030.

Grens and recreational facilities in the region will be promoted as much as possible. The same goes for recreational facilities in the port, such as cycle paths and viewpoints. In the way, the port can open itself up and provide space for such low-impact recreational use.

Therefore, CO₂ emissions in the port and industrial complex need to be reduced by 35% in 2025, and by 50% in 2030, compared to 1990 levels. In effect, the use of renewable and clean fuels and improvements in energy efficiency, as well as large-scale carbon capture and storage in empty offshore oil and gas fields. The European Union aims at a 45% reduction in CO₂ emissions for the transport sector in 2030, compared to 1990, which is in line with the ambitions of the Port Vision 2030.

Climate change will lead to rising sea levels and greater fluctuations in river levels. The latter in particular has implications for the port. In the future, not only will we see periods with high river levels, but the lower levels will be more common. This latter effect of climate change will have the final outcome of safe and sustainable navigation. Furthermore, saltwater, salinising soil, groundwater and surface water. Low water levels also have an impact on the loading levels of inland vessels and the capacity of the river. A Second Convention of Maastricht, outlining international agreements for optimal navigability of the river in particular (using water levels), could limit the impact on inland shipping.

Rising sea levels have relatively little direct impact on the port, as large sections of the port are 5 meters or more above NAP (New Amsterdam Water Level). The Dutch Delta Programme will ensure that the Netherlands remains well protected against high water levels in the coming decades. The port will need to monitor the situation, to make sure that it remains accessible for shipping and that fresh water is guaranteed for industry.

The port has a positive effect on health in a second way by creating attractive landscapes around these paths also plays an important role.

Finally, a lot of effort goes into reducing people’s exposure to fine particles, noise and other forms of pollution, in order to improve their health. Air pollution, especially from traffic, can result in respiratory complaints such as coughing, wheezing and shortness of breath. Noise is a major culprit. Statutory environmental norms must be pursued vigorously. In 2030, organic raw materials will be produced sustainably and their certification will be beyond doubt. Clean and renewable energy source will be an important element of electricity production in the port of Rotterdam in 2030.

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In order to realise the Global Hub and Europe’s Industrial Cluster, businesses must be able to offer competitive conditions to attract skilled personnel. This is a challenge: the port of the future will have more jobs for the highly educated. There will also be more demand for logistical and technical personnel at MBO-4 level (highest level of intermediate vocational education). At the same time, the labour force is shrinking and technical education isn’t popular nowadays. Where young people and education are mentioned below, this expressly includes the Municipality of Rotterdam as well as the municipalities on the north and south banks of the Nieuwe Maas and the Wassenaar.

It is up to the region to guarantee a significant increase in the number of qualified young people and lateral entrants. In addition, labour migration will continue and more skilled personnel will come from other European countries to work here.

Actions

1. Increasing the number of technical and logistics graduates

Students need to be encouraged to take an interest in the port from a young age, at all educational levels. Businesses are involved in the curriculum for this reason, to ensure that it is well-aligned with the kind of jobs available in the port, and to guarantee enough attractive trainee posts. Long-term work-study programmes focusing on technical and logistics skills are essential. Another point that is high on the agenda is to help people who have trained in other disciplines to adapt their skills. By handing responsibility for coordination and implementation to one single party, initiatives are no longer fragmented.

2. Getting young people interested

It is a challenge to increase awareness of the port and the various jobs it offers, and to improve their popularity. Successful projects, such as the special port education curriculum, guest lectures, the ‘Ideal Port’ lectureship and port excursions for pupils will be continued. Young people living in the region, in particular, will be informed frequently about the prospects of working in the port. The information centre on the Maasvlakte will remain open, even after completion of the first stage of the construction of Maasvlakte 2. Its success will be perpetuated by informing a wide audience about the port and its activities.

3. Up-to-date human resources policy

Modern HR policies will be indispensable in the port in the coming decades. This involves policies geared towards enthusing and recruiting specific target groups, policies that are in line with the wishes of a new generation of young people, women, immigrants and older employees. To young people, for instance, responsibility, variety and a horizontal organisation are important; women find a safe social working environment important, and flexible working hours are important to everyone. Another essential requirement is ongoing training for existing employees, in order to promote internal mobility within the organisation. Specific attention needs to be paid to the match between the qualifications at the lower end of the employment market and jobs in the port.

4. Strengthening facilities in the port

The quality of the working environment is an important aspect when it comes to retaining staff in the port. Besides paying close attention to the visual quality, that is the physical appearance of the port and industrial area, it is also important to provide comprehensive clusters of facilities to make accessibility easier. Clusters of, for instance, hotels and restaurants, supermarkets and meeting places, combined with good facilities for truck drivers, will contribute to a pleasant working environment.

Development of jobs in the port of Rotterdam

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<tr>
<th>Year</th>
<th>Total Jobs</th>
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<tr>
<td>2008</td>
<td>20,000</td>
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<tr>
<td>2010</td>
<td>40,000</td>
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<tr>
<td>2020</td>
<td>60,000</td>
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<td>2030</td>
<td>80,000</td>
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</table>

P.64 4.6 Work

A_ambition:

In 2030, businesses operating in the port can attract skilled personnel at all levels. Work in the port is popular and education is well aligned with demand.
In its city vision, the city council aims to make Rotterdam a clean, colourful port city on the Maas estuary. In 2030, Rotterdam will be a dynamic and exciting port city. The aim is to build a strong economy and an attractive city to live in. At the moment, Rotterdam’s labour force is relatively young, which contributes significantly to the dynamic city climate. The key points of the city vision support the ambitions for the port, as outlined in the Port Compass and vision case. In line with the city vision, this port vision outlines the ambitions and the actions necessary to create the dynamic environment for a dynamic port in 2030. It is not only about the city of Rotterdam. In some respects, the relationship between city and port region is even more evident. For example, a good 37% of the labour force of Voorne Putten (the area south of the port) is active in the port. Port, city and region need each other and reinforce each other.

1. An attractive living climate for both city and region

A dynamic port requires a dynamic region, and vice versa. A major part of this is a comprehensive regional and urban building programme, which is realistic and aimed at diverse population and income groups. These are important requirements, for instance for attracting the headquarters of international companies. In order to enhance Rotterdam’s image as a residential city, the quality of its public spaces must be improved. Efforts to improve the quality of the city centre must continue and more space must be reserved for green areas, recreational areas and other facilities. Part of this is the development of a high-quality urban living environment on the north bank of the Merwehaven and Vierhavens, as part of the City Ports area.

The port itself can be made more attractive as a place to enjoy through consistent, continued implementation of the Visual Quality Plan. Among other things, this involves the careful planning of public spaces, having businesses pay attention to the physical appearance of their premises, reserving space for low-impact recreation (cycling, inline skating, viewpoints, Maaslande beach, etc). The large size of the western port area also provides opportunities for visitors to experience the port by boat from Hook of Holland. Section 4.5 outlines how the port should contribute to the improvement of the regional living climate by removing nuisance situations.

2. Improving economic synergy between port and city

Targeted acquisitions focused on attracting the headquarters of offices of international companies. Involving industry, logistics and port-related services are vital for the improvement of the economic synergy between city and port. The efforts of the Municipality of Rotterdam as part of the Connecting Delta Cities programme (focused on knowledge exchange relating to water management and climate adaptation) are to some extent aligned with the drive for acquisition.

The City Ports area plays an important role in creating (sustainable) economic spin-off from the port in the city of Rotterdam. The development of the Central District (close to Rotterdam Central Station) plays an important role in this. The RDM Campus has an important role, developing into the premier centre for innovation where education and businesses meet.

3. Improving the knowledge and innovation climate

The innovation climate in the region will improve as knowledge institutions, businesses and government agencies work better together. Research can be better tailored to the needs of business and innovators can be applied directly in practice. It is essential for the development of the Global Hub and Europe’s Industrial Cluster that the port is a laboratory for innovation. Companies, either new or existing, need to be able to nurture their ideas from seed to fruition. The RDM Campus has an important role, developing into the premier centre for innovation where education and business meet.
The City Ports (Stadshavens) Rotterdam area will undergo some big changes in the next few decades. The transition has a dual aim: to strengthen the economic structure of the city and the port and to create a high-quality living and working environment. Both objectives aim to improve the business climate in the city and the region, on a physical as well as socio-economic level. There are three goals: connection between city and port, sustainable development and internationalisation. In partnership with business parties, the Port of Rotterdam Authority and the Municipality of Rotterdam will make continuous living and working quarters in the City Ports in the coming 20 to 40 years.

Over the years, the port has slowly grown away from the city. Now it is looking to reconnect. City Ports also contributes to the ambition expressed in the city vision (Stadsvisie) to realise an economically strong and attractive city. Now it is looking to reconnect. City Ports also contributes to the ambition expressed in the city vision (Stadsvisie) to realise an economically strong and attractive city.

In the structural vision for City Ports, the direction of the development is expressed in five streams of opportunity:

1. Reinventing Delta Technology: City Ports will be a leading technological hub and in knowledge-intensive, port-related activities. The Port Authority will invest around €70 to €80 million in the Sluisjesdijk, Waalhaven East and South. Some of this money will be spent on the reconstruction of Waalhaven East side. Significant steps have been taken in the development of the City Ports, especially on the south side of the river Nieuwe Maas. The former RDM buildings will host several educational institutions (RDM Campus, Academy of Architecture), space has been created for start up businesses (RDM Innovation District) and the Delta City office development has opened its doors. The water front connection has also been improved. In the next few years, the RDM site will get a new access road on the western side. The Port Authority will continue to renovate the outdoor parking facilities and better use (public) transport, excellent (slow traffic) connections, innovation cycle and Park and Ride facilities and better use of the water.

In the Rotterdam Cool Port project, the Port Authority is working with market parties to develop a cooler belt for the logistical exchange of reefer containers. In combination with refrigeration and freezing warehouses, Cross-dock Facilities can be used for cross-distribution directly from the container among the different Extreme conditions. The renovation of Maasboulevard Cool Port shifts the focus of fresh logistics, shipping and industry, whose presence in the port. In addition, some key players in the Hub and Interconnection are the size of an SME themselves. All of this requires the government and the Port Authority to pay specific attention to SMEs.

4. SME

Small and Medium Enterprises has a major role to play in realising the vision. Both the companies that handle large volumes (Global Hub) and the big industrial businesses (Europe’s Industrial Cluster) use many and varied suppliers and service providers. The presence and quality of these businesses, which are not always immediately recognisable as port-related, are vital to the port. In addition, some key players in the Hub and the Cluster are the size of an SME themselves. All of this requires the government and the Port Authority to pay specific attention to SMEs.

5. Dry business sites in the region

In the (wide) area surrounding the port, dry business sites (that is, sites not open to the water) are needed to support the development of the port complex. These include service providers and suppliers in the fields of logistics, shipping and industry, whose presence in the region is important to the functioning of the port. However, it also involves the creation of facilities which do not require access to water. When the throughput forecasts were translated into demand for land in 2030, only sites bordering the water were considered (section 4.2). No calculations were made for the demand for dry sites outside the port. A survey at the regional level to identify the availability of and need for dry business sites and office sites should therefore have its inclusion in regional programmes.
Greenports – Port

The port of Rotterdam is strategically well positioned with respect to the five Dutch Greenports. The Greenports are a concentration of activity in the fields of cultivation, trials, logistics, supply and knowledge development in the greenhouse horticulture sector. Neighboring Greenport South-Holland is the largest and represents around 40% of the total Dutch greenhouse sector and is very important to the Dutch economy. Greenport South-Holland comprises the greenhouse horticulture and trade cluster in food production and horticultural plants that are transported to the Westland-Oostland, Zuidplas and Barendrecht areas, the two growing centers in the country and the 4th cluster in the “Duna and Bulb Region”. Greenport Venlo in the future may become a strong horticultural center with South-Holland, although the intense relationship could be better. Extending the physical and substantive relationships, particularly between Greenport South-Holland and the nearby Rotterdam port complex, could provide added value to the Dutch economy.

As the moment, the port is particularly important to the Greenports in connection with the storage and transhipment of fruit and vegetables. Most European imports and exports of fruit and vegetables are still transported by road. In the future, more and more transhipment of fruit and vegetables from overseas.

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The development of this trade will be transported by ship, partly due to the CO2. The scale of the flows and containerisation also make it increasingly interesting to transport fresh cargo by inland vessel between sea terminals and the Greenports. FRESH LOGISTICS

Besides the use of residual heat from industry has global knowledge centre in bio-based chemicals. The scale of the flows and containerisation also make it increasingly interesting to transport fresh cargo by inland vessel between sea terminals and the Greenports. FRESH LOGISTICS

Plants need CO2 to grow. A small proportion of the CO2 produced by the industry is captured and transported by pipeline to the greenhouse. Currently, more than 0.3 million tonnes of CO2 per year are taken from the port to the Greenport South-Holland. The potential is far greater.

The distinctive Central Station and the adjacent square form a magnificent portal through which the international community enters the city, having arrived by high-speed train or ferry. Public spaces have had a real overhaul. Pedestrianisation and pedestrian-friendly streets have been a hallmark of the city’s regeneration.

In 2030, Rotterdam city centre will have been transformed six-fold in size. The building blocks, streets and facades that dominated the urban landscape for the last century have disappeared. When the dust clouds settle, they reveal a city centre with the international flair befitting a world port. The distinctive Central Station and the adjacent square form a magnificent portal through which the international community enters the city, having arrived by high-speed train or ferry. Public spaces have had a real overhaul. Pedestrianisation and pedestrian-friendly streets have been a hallmark of the city’s regeneration.

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In the Netherlands, large-scale spatial planning investments have a high risk of failure. Often they involve long and complex procedures, which have to be decided by the Dutch Council of State. It is a major challenge to simplify and speed up the complex spatial planning procedures and regulations. The absence of results creates a belief that large-scale planning projects never get off the ground or, if they do, too slowly and at too high a cost. Recent cases in point are the construction of the A4 Midden-Delfland motorway and the trial projects for carbon storage in Barendrecht and in the North of the Netherlands. In order to realise the Global Hub and Europe’s Industrial Cluster, there must be fewer regulations, less bureaucracy and less time needed for consultation. This should not affect the legal protection of citizens.

**Actions**

1. **Applying the principle of double jeopardy**

   In legislation on spatial planning, the same principle must be applied that is used in criminal law, where the same case cannot be tried twice. The challenge is to develop a planning system in which decisions are made via a single environmental plan that covers nature, the spatial element AND the environment. For every aspect of the environment and nature, there is a process in which everyone's interests are examined and tested in detail. This process must come at either the beginning or the end of the planning procedure, but not both. This will reinstate the original system of spatial planning in the Netherlands. All interested parties are informed at an early stage about the possibilities and impossibilities of spatial developments.

2. **A single, efficient point of contact**

   One of the strengths of the port of Rotterdam is the result-driven partnership between the DCMR (the regional Environmental Protection Agency), the municipal authority, the provincial government and the Port of Rotterdam Authority. When the ports of Rotterdam, Dordrecht and Moerdijk start functioning as one integrated complex, directions and control need to be organised in a similar way. In addition, the fire brigade needs to be fully involved in the authorisation of licences. This creates a single point of call for businesses when applying for their licences. Businesses will also know in advance precisely which procedures need to be followed and which licence conditions they have to meet.

3. **Management of environmental space**

   Efficient use of the available environmental space requires an area-oriented system for managing and allocating the scarce environmental space available (licences through environmental umbrella organisation) in the best possible way. The environmental space needs management to make this space available, to assess where environmental pollution can be reduced in the most (cost) efficient way and also to exercise supervision and control. Finally, this system enables licences to be granted much more speedily, if the need for environmental space fits in the integral environmental space available.
4.9 Innovation

Ambition:

In 2030, the port of Rotterdam is an international leader in the development and application of innovations which contribute to sustainable and efficient supply chains and the safety and accessibility of the port complex.

The development of Europe’s Industrial Cluster and the Global Hub leading up to 2030 will set a great many challenges, especially in the fields of sustainability, efficiency, accessibility and safety. Rotterdam aims to be the international frontrunner in this respect. This will demand a good deal of innovation dynamics. This drive will involve not only the development of new concepts, but also – and especially – the application of (new) technologies and processes that have been developed in other sectors. For instance, innovation involving smart grids, clean transportation fuels, clever logistics concepts and sustainable energy production. This requires technical innovations and, above all, social innovations in organisation and partnerships.

Actions

1. Innovation climate
   Technical innovations can only be directed to a limited degree and most of them occur in young companies. A favourable business climate for startups and innovative SMEs must therefore be given some thought, for instance through incentives and support for startups, through facilities such as multi-tenant business premises (RDM) and innovative tax arrangements. An example of the latter is a system in which businesses pay less tax if they have a large R&D budget. A good innovation climate also contributes to social innovations.

2. Extending partnerships
   Partnerships are essential to both the development and the implementation of innovations. The importance of a good relationship between knowledge institutions, government agencies and business should not be underestimated. Knowledge institutions must develop innovations that are much more tuned to the demands of the business sector, while the business sector must be brave enough to commission knowledge institutions to explore new territories. The Rotterdam Climate Initiative is an excellent example of a broad partnership that has grown into a platform for driving innovation. These kinds of partnerships are essential to the innovation dynamics in the port complex.

3. Supporting and developing innovation facilities in the port
   Attracting new technologies and innovative activities requires facilities for testing and expanding innovations. This involves facilities offering businesses favourable conditions to invest in the development of knowledge applications by knowledge institutions. The port already has a number of these facilities in place, such as PlantOne and DNAMO. For the port, it is important to strengthen and expand such facilities, so that Rotterdam can become the preferred location for innovative businesses.

4. Investing in knowledge development at all levels and stimulating talent
   A successful port needs intelligent and enterprising people. This requires investment in education and research. Investments are therefore made in academic chairs for port studies at the universities of Rotterdam and Delft and lectureships at the Rotterdam colleges of higher professional education. Partnerships between universities and technical colleges are reinforced. And talented young people are encouraged to start their own companies in the port. In addition, numerous partnerships with knowledge institutions (including TNO, DINALOG, Wageningen University and Research Centre) have been set up to develop and test innovative concepts and products.

Top 8 innovation challenges

1. Transition to bio-based industries/green chemicals
2. Increasing space productivity
3. Increasing energy efficiency in industrial processes
4. Smart traffic and mobility management for road, rail and inland waterways
5. Optimising and further developing the supply chain
6. Increasing sustainability of all modes of transport
7. Cultivate capture, transport and reuse
8. Sufficient supply of qualified young people to fill jobs in the port
Europe has a significant impact on the development of the port of Rotterdam in many ways. At the same time, logistical and industrial developments in Rotterdam are of major relevance to the prosperity of all Europeans. This twoway impact increased further over the coming decades.

1. **Actions**
   - Vigorous European policy and institutions: It is clear from the Euro crisis of 2012 that the monetary union cannot function if European authorities are unable to intervene when Member States don't adhere to the agreements. Over the past decades, the competition rules, in combination with Members States, have created an internal market that continues to function better. Areas of the economy, require an approach that will produce similar results. Particularly, (or get) the public finances of the Member States in order. How the happen, whether it is through a European Commissioner or otherwise, is less important than the result.

2. **Transport & Logistics**
   - The basic principles of the European policy for improving transport and making it function better are those of the Port Vision 2030. The development of the Trans European Transport Network (TEN-T) is a huge impact if the internal European market is to function better. This involves not only the physical capacity of these networks and inland waterways systems, but also the free access to them, including the technical terminalisation of systems and equipment, creating a real and equal market for the ports. It is important that they all comply with the same rules and that Member States do not have the possibility of designing a barrier, for instance for the construction of port infrastructure. After all, this would result in unfair competition and thus to a less than optimal use of resources. Financially autonomous and transparent port authorities can counteract this. The same level-playing field is needed to reduce the detrimental impact on the environment.

A major concern is that the rules and objectives in this matter is the same for all Member States and that they must be approached in the same way. For example, the North Sea and Baltic Sea have been designated as Emission Control Areas (ECA). From 2015 onwards, stricter standards on the percentage of sulphur in bunker oil will apply than for the Mediterranean or the Atlantic Ocean. In order to discourage unfair competition, as well as for reasons relating to health, nature and the environment, it would be a positive move to designate all the waters surrounding the European Union as ECA. One of the next steps in making shipping cleaner is the switch to cleaner fuels such as LNG. Commitment at the European level is needed for this.

3. **Energy & Industry**
   - In the coming decades, Rotterdam will fall an increasingly important role in the energy supply for Northwest Europe. The combination of energy clusters and one or more LNG terminals, the development of bio-based industries, the development of a solar park and large-scale carbon capture, usage and storage contribute to this. Through partnership with the Petrochemical industries in the Antwerp-Rotterdam region and the concentration of these industries in coastal locations, the area will become a major Industrial Cluster. Europe actually already stimulates the development of power stations and large-scale carbon capture, usage and storage. Commitment at the European level is needed for this.

The second major factor in the geography of the continent. The Alps in particular form a barrier to transport. At the same time, rivers such as the Rhine play a large part in the transport for the highly competitive inland shipping. The same applies to railways and roads, which are easier to construct in the flatter, northern part of Europe.

The third factor is the size of the container ships which transport cargo to and from Europe. An example of this is the Port of Rotterdam which cannot accommodate larger ships than 150,000 TEU. This means that only certain ports can handle such ships.

The hinterland of European ports
Chapter 4 outlined the actions to realise the Global Hub and Europe’s Industrial Cluster. The pivotal question in the implementation agenda is: ‘What are we going to do to realise the Port Vision 2030?’ That question can be answered by specifying the actions required for realising the Global Hub, Europe’s Industrial Cluster and the ten success factors from Chapter 4. The agenda lists all the actions clearly. It starts with an overview of the main objectives for the Global Hub, Europe’s Industrial Cluster and each of the ten success factors, and then goes into more detail.

Generally speaking, there is a disparity between the speed at which the world is changing—and consequently the speed of action that is needed—and the slow-moving process of consultation and decision making. They are growing further apart all the time. The consequence is that port and industry, the engines of the economy, are losing valuable time. The speed of planning, decision-making and implementation must be stepped up in all organisations. Speed is the operative word when it comes to realising this vision.
Context of municipal, regional, provincial, central government and European Union policies: Strengthening and innovating Rotterdam Mainport

The ambitions presented in the Port Vision are not confined to the region. The Port of Rotterdam is part of a network of spatial planning and is a core economic development that is widely supported. Further strengthening and innovating Rotterdam Mainport is a widely shared ambition of the European Union. The Port Vision contributes to the further development of the port and the economy. The ambition is elaborated in the Economic Agenda Rotterdam Mainport as an important priority. The Port Vision is part of an orientation in national road network must be completed soon. The main concerns are the Blankenburg tunnel and the A4-South Motorway. At the same time, better use must be made of the available infrastructures through another objective is to reduce the nuisance caused to people living in the vicinity of the port. The port experience significant environmental nuisance (stench, noise, traffic), these problems should be dealt with. This also means that, except for the City Ports area, no houses or other facilities near to the port should be built in the close vicinity of the port, as this would in turn weaken the competitive position and cause economic damage.

Efficient supply chains in a European network

Ports are regarded increasingly as links in global supply chains, which makes better accessibility increasingly important for the competitive position of the ports. Efficiency and reliability of the transport system are key factors for competitiveness. Strengthening and innovating Rotterdam Mainport also plays a significant role in fulfilling the objectives of the spatial-economic policies. The Annex Agenda Zuidplas, on which the Zuidplas partners and central government reached agreement in its MIRT administrative consultation dated 10 November 2010, identifies the further development of Rotterdam Mainport as an important priority. The ambition is elaborated in the Economic Agenda Zuidplas, on which the transport & logistics, maritime and logistic services sectors are identified with respect to accessibility, investment in innovative logistics and policies for shippers. Realising efficient, sustainable and customer-friendly logistics is regarded as an important factor for competitive position. Without this integration, efficiency-related advantages will not be as great, making it harder for both ports to attract and retain investments. Without broader integration of the logistics chain, production and growth in bio-based chemicals and energy will not be as great, making it harder for both ports to compete and retain investments. Without broader integration of the logistics chain, production and growth in bio-based chemicals and energy will not be as great, making it harder for both ports to compete and retain investments.

Industrial transition

Diversification and the increasing sustainability of energy generation, CCS, development of bio-based chemicals and growth in bio-based chemicals and energy are identified with respect to accessibility, investment in the DelTri Platform towards developing a top region for innovation. The Port Vision contributes to the Dutch government, regional and local governments, the business community and knowledge institutions. All of these organisations agree that the economic and environmental factors for shippers. Realising efficient, sustainable and customer-friendly logistics is regarded as an important factor for competitive position. Without this integration, efficiency-related advantages will not be as great, making it harder for both ports to attract and retain investments. Without broader integration of the logistics chain, production and growth in bio-based chemicals and energy will not be as great, making it harder for both ports to compete and retain investments.

Efficient supply chains in a European network

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The most important and crucial actions from the previous chapters can be arranged in the following themes: Europe's Industrial Cohesion, Global Hub, accessibility, living environment and innovation.

Improving accessibility

Accessibility is essential to the success of the port. All scenarios show significant growth, especially in container flows. In order to guarantee the accessibility of the port in the future, a number of missing links in the Rotterdam region’s national road network must be completed soon. The main concerns are the Blankenburg tunnel and the A4-South Motorway. At the same time, better use must be made of the available infrastructures through another objective is to reduce the nuisance caused to people living in the vicinity of the port. The port experience significant environmental nuisance (stench, noise, traffic), these problems should be dealt with. This also means that, except for the City Ports area, no houses or other facilities near to the port should be built in the close vicinity of the port, as this would in turn weaken the competitive position and cause economic damage.

Improving the quality of the living environment

Reducing the nuisance caused to people living in the vicinity of the port is an important part of the Port Vision. Rijnmond must be a region where people want to live, work and spend their leisure time. Whenever residents want to take their business to other ports. This would weaken the competitive position and cause economic damage.

Improving innovation

In order to realise the vision, innovations and their large-scale implementation are vital, from optimising processes and integrating chains in industry, pulling in place fast terminal equipment and cleaner transport. All parts of the port and the Port Alliance need innovation to achieve the efficiency and sustainability goals. This means investing in the development and application of knowledge. In the future, the Netherlands will not be in a good position to compete on traditional production factors. It is best to make targeted investments in the development and application of knowledge that advances the traditional strong sectors of the Dutch economy. Social innovation is an important part of this, as we change from the European net to more local innovation, education, traffic management, etc.
Cooperation between port authorities

The purpose of Rotterdam’s partnerships with the port authorities of other seaports is to boost the clients’ or society in general, for instance gaining maximum results from the use of scarce resources or optimising the use of available space. Organisational integration in the form of a National Port Group is not an end in itself.

The cooperation of Dordrecht and Maastricht can be fully integrated with the ports of Rotterdam within a few years. On an economic level, they already function as a single port, making it logical to have one controlling authority for port management, development, operation, and supervision, to handle shipping, etc.

The port authorities of Amsterdam and Rotterdam have been working together for a long time. They have both aimed to boost the hinterland infrastructure further to strengthen the position of the port. A number of companies have a presence in both ports and consider the Amsterdam-Rotterdam region as a single port. This means that collaboration as a means of integrating the port authorities could lead to benefits of synergy.

The timeframe for completing the tasks is also given for each action.

The following pages present the implementation agenda of the Port Compass. All the actions and tasks discussed in the preceding chapters are listed and organised in a brief, clear and logical way. Only those items that specifically concern the Global Hub and Europe’s Industrial Cluster have been linked with those concepts. The activities undertaken by both concepts are grouped with the ten success factors as described in Chapter 4.

The Port Vision 2030 expresses the vision as broadly supported at the end of 2011. Parts of this document, and thus also the agenda, will be subject to change in the coming years. This is already evident from the fact that the Draft Port Vision presented in May was changed five months later, due to the addition of an extra success factor. The Euro crisis has clarified the importance of European economic integration, which was taken for granted for a long time. In the coming years, the progress of the agenda will be monitored and the Port Authority will annually report on it. The need for adjustment will also be looked at, for instance the acceleration or slowing down of certain actions, or the inclusion of new ones. The intention is for this monitoring task to be performed in collaboration with Deloitte, the municipality, central government and other parties.
In 2030, Rotterdam is Europe’s major port and industrial complex. It is a very strong combination of Global Hub and Europe’s Industrial Cluster, both leading in efficiency and sustainability. Rotterdam is closely linked to industrial and logistics hubs in Northwest Europe. Leading companies invest long term in the most modern facilities. Close partnerships between businesses, government agencies and knowledge institutions lead to a high-quality labor market and living environment, and excellent connections. Adaptability is the keyword. This will make the complex an important cornerstone for the welfare of the region, the Netherlands and Europe in 2030.

### How will we realize the Port Vision 2030?

**FOR THE GLOBAL HUB**
- Increase the throughput capacity and extend the hub function.
- Improve the connection with wind coastal wind hubs.
- Increasing the efficiency of the logistics chains.
- Better information exchange.
- Minimise the ecological footprint of logistics chains.
- Attract high-end activities to the region.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
-kernals the right investment for the port.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Attract high-end activities to the region.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.

**INVESTMENT CLIMATE**
- Improve the investment climate.
- Improve the investment climate.
- Improve the investment climate.
- Improve the investment climate.
- Improve the investment climate.

**LAND USE**
- Use land more efficiently.
- Technology and innovation.
- Ensure flexibility in spatial development of the port.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Attract high-end activities to the region.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.

**ACCESSIBILITY**
- Optimal sailing times for sea-going vessels.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Attract high-end activities to the region.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.

**SHOPPING**
- Increase the number of students graduating from technical and logistics education.
- Stimulate attractive employers.
- Strategic planning of demand and supply on the labor market.
- Increase the quality of education and research.
- Increase the possibilities for application of new innovations.
- Setting innovation priorities.
- Optimal sailing times for sea-going vessels.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.

**LAW & REGULATIONS**
- Improve the quality of laws and regulations by renewing planning, nature and environmental laws.
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**ENVIRONMENT, SAFETY AND QUALITY OF LIFE**
- Improve the quality of life.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.

**CITY AND REGION**
- Make living and working in and around the port more attractive.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.

**LABOUR**
- Get young people interested in the port.
- Improve the quality of education and research.
- Increase the possibilities for application of new innovations.
- Setting innovation priorities.
- Optimal sailing times for sea-going vessels.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.

**INNOVATION**
- Increase the quality of education and research.
- Improve the quality of life.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.
- Improve intermodal and rail connections.
- Minimise the ecological footprint of logistics chains.

**EUROPE**
- Strong European policy and institutions.
- Development of an efficient European transport and logistics system.
- Develop cultural and energy policy.
- Develop cultural and energy policy.
- Develop cultural and energy policy.
- Develop cultural and energy policy.
- Develop cultural and energy policy.
- Develop cultural and energy policy.
- Develop cultural and energy policy.

### FOR BOTH
- Increase the number of students graduating from technical and logistics education.
- Stimulate attractive employers.
- Strategic planning of demand and supply on the labor market.
- Increase the quality of education and research.
- Increase the possibilities for application of new innovations.
- Setting innovation priorities.
- Optimal sailing times for sea-going vessels.
- Minimise the ecological footprint of logistics chains.
- Deliver value for money with Rotterdam’s Port Product.

### FOR EUROPE’S INDUSTRIAL CLUSTER
- Cluster the industry in Rotterdam.
- Connect the industries of Antwerp, Moerdijk, Flushing, Terneuzen and Rotterdam.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Develop banning chemical industry.
- Increase production capacity and amount of production sites.
- Attract high-end activities to the region.
In 2030, Rotterdam is the leading European hub for global and intra-European cargo flows. It is Europe’s Global Hub for containers, fuel and energy flows. With the hinterland, Rotterdam forms an integrated network. Rotterdam is a frontrunner in sustainable and efficient chains.

**Vision**

1. Improve the quality, efficiency and capacity of hub-related inland transport.
2. Increase the frequency and reliability of rail and barge services and attracting the number of destinations in the hinterland.
3. Develop more extended gates in the hinterland, enabling administrations to take place at multiple locations.
4. Develop the European hinterland network in cooperation with other European sea ports.
5. Better coordinate the dispatching of containers between shippers, terminals, service providers, harbour master and transport companies.
6. Decrease the turnaround times of sea going vessels by developing a ‘pit stop’ approach.
7. Develop extended gates in the hinterland.
8. Develop a national port community system.
9. Develop a cohesive and integrated national logistics network.
10. Make agreements about the modal shift with new and existing terminals.
11. Make demands on measures of trucks, trains, barges and sea going vessels.
12. Stimulate the use of canal and inland waterways.
13. Develop small scale LNG and offer LNG as bunkering fuel.
14. Use environmental zoning to reduce the footprint of transport.
15. Increase the use of quayside electricity for barges and ferry ships.
17. Attract high-end specialized logistics service companies.
18. Strengthen the business community (trade, financial, engineering, legal, ICT) for the logistics sector.

**GLOBAL HUB**

- Increase terminal productivity.
- Reduce a single oil hub.
- Develop an LNG hub.
- Build a terminal for turnover of dry biomass.
- Ensure sufficient facilities for large, rail and barge vessels.

**IMPROVE THE INTERCONNECTION WITH MULTI MODAL INLAND HUBS**

- Remove bottlenecks between shippers, terminals, service providers, harbour master and transport companies.
- Develop extended gates in the hinterland.
- Develop more extended gates in the hinterland, enabling administrations to take place at multiple locations.
- Develop the European hinterland network in cooperation with other European sea ports.
- Better coordinate the dispatching of containers between shippers, terminals, service providers, harbour master and transport companies.
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- Increase the use of quayside electricity for barges and ferry ships.

**INCREASE THE THROUGHPUT CAPACITY AND EXTEND THE HUB FUNCTION**

- Improve the quality, efficiency and capacity of hub-related inland transport.
- Increase the frequency and reliability of rail and barge services and attracting the number of destinations in the hinterland.
- Develop more extended gates in the hinterland, enabling administrations to take place at multiple locations.
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- Increase the use of quayside electricity for barges and ferry ships.

**INCREASE THE EFFICIENCY OF THE LOGISTICS CHAINS**

- Reduce costs by improving the efficiency of the logistics chains.
- Increase the frequency and reliability of rail and barge services and attracting the number of destinations in the hinterland.
- Develop more extended gates in the hinterland, enabling administrations to take place at multiple locations.
- Develop the European hinterland network in cooperation with other European sea ports.
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- Increase the use of quayside electricity for barges and ferry ships.

**BETTER INFORMATION EXCHANGE**

- Better coordinate the dispatching of containers between shippers, terminals, service providers, harbour master and transport companies.
- Decrease the turnaround times of sea going vessels by developing a ‘pit stop’ approach.
- Develop extended gates in the hinterland.
- Develop a national port community system.
- Develop a cohesive and integrated national logistics network.
- Make agreements about the modal shift with new and existing terminals.
- Make demands on measures of trucks, trains, barges and sea going vessels.
- Stimulate the use of canal and inland waterways.
- Develop small scale LNG and offer LNG as bunkering fuel.
- Use environmental zoning to reduce the footprint of transport.
- Increase the use of quayside electricity for barges and ferry ships.

**MINIMISE THE ECOLOGICAL FOOTPRINT OF LOGISTICS CHAINS**

- Reduce costs by improving the efficiency of the logistics chains.
- Increase the frequency and reliability of rail and barge services and attracting the number of destinations in the hinterland.
- Develop more extended gates in the hinterland, enabling administrations to take place at multiple locations.
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- Develop small scale LNG and offer LNG as bunkering fuel.
- Use environmental zoning to reduce the footprint of transport.
- Increase the use of quayside electricity for barges and ferry ships.

**ATTRACT HIGH END ACTIVITIES TO THE REGION**

- Further development of a global price point for non-ferrous metals, mineral oils and biomass.
- Attract high-end specialized logistics service companies.
- Strengthen the business community (trade, financial, engineering, legal, ICT) for the logistics sector.

- Reduce costs by improving the efficiency of the logistics chains.
- Increase the frequency and reliability of rail and barge services and attracting the number of destinations in the hinterland.
- Develop more extended gates in the hinterland, enabling administrations to take place at multiple locations.
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- Use environmental zoning to reduce the footprint of transport.
- Increase the use of quayside electricity for barges and ferry ships.

**TIMEFRAME**

- Vision 2030

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**Vision**

- In 2030, Rotterdam is the leading European hub for global and intra-European cargo flows. It is Europe’s Global Hub for containers, fuel and energy flows. With the hinterland, Rotterdam forms an integrated network. Rotterdam is a frontrunner in sustainable and efficient chains.
In 2030, Rotterdam’s industrial and energy complex functions as an integrated cluster with Antwerp, making it the largest, most modern and sustainable petrochemical and energy complex in Europe. This complex competes on a global scale, thanks to its major cluster advantages, integrated supply chains and energy efficiency. The transition to sustainable energy generation and bio-based chemicals is in full swing.

**Port Vision 2030**

- Construct pipelines between companies in Rotterdam.
- Realise the new industrial port in the city and on greenhouses.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Increase production capacity and renewal of production assets.
- Attract high end activities to the region.

**Cluster the Industry in Rotterdam**

- Realise smart grid for electricity.
- Increase the share of low-sulphurous fuels in the total fuel production.
- Increase the production of biofuels.
- Attract specialized service providers.

**Connect the Industries of Antwerp, Moerdijk, Flushing, Terneuzen and Rotterdam**

- Fully reuse residual heat completely.
- Use industrial heat in the city and on greenhouses.
- Construct the new industrial port in the city and on greenhouses.
- Generate energy with more renewable resources.

**Generate Energy with More Renewable Resources**

- Full use of renewable heat completely.
- Use industrial heat in the city and on greenhouses.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Increase production capacity and renewal of production assets.

**Develop Facilities for Capture, Storage, Distribution and Trade of CO2**

- Fully reuse residual heat completely.
- Use industrial heat in the city and on greenhouses.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Increase production capacity and renewal of production assets.

**Develop Bio-based Chemical Industry**

- Fully reuse residual heat completely.
- Use industrial heat in the city and on greenhouses.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Increase production capacity and renewal of production assets.

**Attract High End Activities to the Region**

- Fully reuse residual heat completely.
- Use industrial heat in the city and on greenhouses.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Increase production capacity and renewal of production assets.

**Europe’s Industrial Cluster**

- Fully reuse residual heat completely.
- Use industrial heat in the city and on greenhouses.
- Generate energy with more renewable resources.
- Develop facilities for capture, storage, distribution and trade of CO2.
- Increase production capacity and renewal of production assets.
Moderate development of port dues.
Moderate development of the costs for port facilities and services.
Moderate development of taxes and fees.
Limit the amount of inspections of ships, cargo and security and speed them up.
A single counter for port permits.
Speed up public decision making.
Prevent conflicting demands in permit applications.
Better involve the fire department into permit procedures.
Execute the ‘Eenvoudig Beter’ (Simple & Better) programme.
Joint acquisition of port related business services, headquarters and shared service centres together with NFIA, RIA and PoR.
Ensure an attractive fiscal climate.
Promoting an active choice for Dutch law and Dutch dispute resolution in shipping contracts (‘Leave your legal footprint in Rotterdam’).
The port of Rotterdam wants to provide room for expansion to world-class businesses in containers, fuels and energy. The premise is that this growth will be realised entirely within the existing port area, including Maasvlakte 2, Dordrecht and Moerdijk, ensuring that the construction of Maasvlakte 3 will not be necessary until 2030.

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- Stimulate underused and extensively used terrain suited for turnover.
- Realise nautical access to ‘dry’ terrains in the port.
- Improve the nautical accessibility in the Botlek area.
- Stimulate the use of terrain, quays and jetties by multiple companies.
- Increase the port’s turnover capacity of trucks and poles.
- Joint management of the port and industrial complexes of Rotterdam, Moerdijk and Dordrecht.
- Expand the break bulk and liquid bulk clusters in Dordrecht.
- Reserve enough land for business sites for past related activities in the region.
- Redevelop the West Waalhaven area and Eemhaven area into a break bulk and short sea hub.
- Realise Rotterdam Cool Port.
- Redevelopment of the East and South side of the Waalhaven area into an attractive site for maritime industries, for nautical and business services.
- Transformation of the Vierhaven and Merwehaven areas into an area for urban economic functions.
- Fast construction of Maasvlakte 2.
- Reserve land for the ‘Oranjetunnel’ on both sides of the New Waterway.
- Reserve land on Voorne-Putten for the pipeline route between Antwerp, Moerdijk, Terneuzen and Rotterdam.
- Reserve land on Voorne-Putten for the pipeline route between Antwerp, Moerdijk, Terneuzen and Rotterdam.
In 2030, access to the port and industrial complex is easy and reliable by all four modes of hinterland transport (inland waterway, rail, road and pipelines).

**MAKING BETTER USE OF INFRASTRUCTURE**

- Make a modal shift happen (shifting transport from road to rail and barge).
- Develop traffic management on the ring road of Rotterdam in accordance with ‘De Verkeersonderneming’.
- Improve traffic management on the port railway and the Betuwe railway.
- Development of traffic management on inland waterways between Rotterdam and Germany and between Rotterdam and Belgium.
- Further development of traffic management in the port.
- Increase the use of pipelines.
- Guarantee accessibility of rivers in cases of extreme high or low water levels, for example by taking bridge heights into account.
- Optimise the safety regime on the Betuwe railway.
- Develop a synchro-modal transport system (Action 2 Top sector logistics).
- Introduce financial incentives for better spreading out traffic (passengers and freight) during the day.
- Optimize passenger traffic in and between Voorne-Putten, the Rijnmond area and the Haaglanden area.
- Develop new concepts for passenger traffic in the port.
- Develop an intricate structure of cycling paths.
- Increase the capacity of the Volkerak and Kreekrak locks between Rotterdam and Antwerp.
- In time construction of the A4 South.
- Construct the Blankenburg tunnel.
- Realise the highway A13/A16.
- Develop an alternative to the current Caland railway bridge.
- Realise the connection of the Betuwe railway in Germany according to schedule.
- Monitor and prevent bottlenecks in the hinterland: the A15 (Papendrecht - Gorinchem), the ‘Van Brienenoord’ corridor, the ‘Moerdijk bridge’ and the ‘rail-bypass Dordrecht’.
- Secure the National programme ‘Hoogfrequent Spoor’ (High Frequency Rail).
- Create enough shunting yards in the port, including Maerdijk.
- Develop a joint vision on the core-network of (inter)national connections and multi modal traffic nodes (Action 3 Agenda Top sector logistics).

**ACCESSIBILITY**

**REDUCE TRAFFIC ON THE HIGHWAYS**

**EXPAND INFRASTRUCTURE AND SOLVE BOTTLENECKS**

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In 2030, the port of Rotterdam is the world leader in shipping sustainability, efficiency and safety.

Optimal sailing times for sea-going vessels

- Expand the area where the National Harbour Master has authority.
- Optimise the sailing of sea-going vessels in Rotterdam, by directing sailing speeds at sea (from Gibraltar).

Laws and regulations

- Don't make Dutch rules and regulations stricter than European law.
- Use a single spatial plan for decision-making on land use, environmental and nature issues.
- Speed up legal procedures for spatial planning and increasing the legal certainty.
- Prevent and cut unnecessary rules and regulations.

Maintain the high safety levels in shipping

- Establish an international plan for the North Sea, in which all interests are carefully considered.
- Make the National Harbour Master responsible for maritime traffic management and incident management from Rotterdam to Maasvlakte.
- Ariadne Quick Response Teams to solve incidents quicker.
- Upgrading the VTM system.
- Broader radar coverage on the Dreandleer KJ and the Hollands Diep.
- Set English as the standard language for communication with all ships.
- Develop new, safer and quicker mooring techniques.

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In 2030, Rotterdam, including the seaports of Dordrecht and Moerdijk, will be the most sustainable port and industrial area in the world. The quality of life in the surrounding areas will have improved demonstrably. This is thanks to an improvement in the local air quality as a consequence of a reduction in the background levels and in emissions in the port area itself, notably of fine particles and NOx. In addition, the nuisance (particularly from noise and stench) suffered by local residents has been reduced and external safety improved (including access/escape routes).

**ENVIRONMENT, SAFETY AND QUALITY OF LIFE**

- **Maintain the high safety levels for inhabitants of the Rijnmond area**
  - Take or ‘delta’ decision that offers protection from flooding and ensures the accessibility and the supply of fresh water for the port.
  - Vitamine external safety barriers for groups of persons in spatial planning.
  - Cluster initiatives with high risks to prevent unnecessary exposure of the population to risks.
- **Keeps environmental thresholds**
  - Universal determination of environmental thresholds.
  - Use the ‘HIC-omgevingsplan’ for the management of environmental thresholds.
  - Develop an interactive environmental information system.
- **Improve the quality of life**
  - Outputs approach maximization of space, and select resistance for inhabitants.
  - Reduce traffic noise around the port between living and working to improve the quality of life.
  - Search for possibilities to combine city and port in the Vierhaven en Merwehaven areas as part of Stadshavens.
  - Reduce the number of incidents at which environmental nuisance occurs.
- **Reduce health and safety hazards**
  - Incorporate a health and safety screening into spatial plans.
- **Reduce environmental emissions**
  - Apply clean technologies in existing companies.
  - Continue the ECO cooperation (Rotterdam Climate Initiative).
  - Execute the project for NOx sources.
  - Execute the regional air quality programme (RAP/RAL).
  - Make fume-return technology compulsory.
- **Improve the quality of life and the quality of the port**
  - Boost the quality of the living environment, nature and the port.

**Leader Timeframe**
- **State**
  - Government
  - DCMR
- **Municipality**
  - PoR
  - Business community
- **Port**
  - PoR
  - PoR + Municipality
- **Ambition**
In 2030, both the Municipality of Rotterdam and the Rijnmond region are characterised by the high quality and great variety of living environments. The urban business climate can equal the global competition in 2030. Rotterdam is the world’s leading knowledge and trade centre, in keeping with the Global Hub and Europe’s Industrial Cluster.

**Ambition**

**CITY AND REGION**

- MAKE LIVING AND WORKING IN AND AROUND THE PORT MORE ATTRACTIVE
  - Carry out the actions that are listed in the City’s Vision
  - Develop coherent urban and regional housing programme
  - Improve the quality of public space in the port, region and Rotterdam
  - Improve the recreational facilities in and surrounding the port
  - Develop high quality facilities for the international community

**Make living and working in and around the port more attractive**

- City and region
  - Municipality
  - Full

**GETTING YOUNG PEOPLE INTERESTED IN THE PORT**

- Make the port a mandatory subject in courses on primary and secondary schools in the Netherlands
- Organise events to introduce young people to the port

**INCREASE THE NUMBER OF STUDENTS GRADUATING FROM TECHNICAL AND LOGISTICS EDUCATION**

- Analyse state of the art educational facilities for technical and port related schools
- Improve the fit between technical and logistics education and the labour market at all levels
- Demand driven education, with a possible introduction of a numerus fixus system at schools
- Offer excellent internships to children in port related education
- Improve the visibility of the port related business community in education

**STIMULATE ATTRACTIVE EMPLOYERS**

- Gear Human Resource policies towards lateral entries
- Improve the qualifications of lateral entries
- Create flexible terms of employment
- Tailor human resource management to the age of workers

**STRATEGIC PLANNING OF DEMAND AND SUPPLY ON THE LABOUR MARKET**

- Monitor and forecast the development of the port labour market
- Coordinate execution of the port labour market programme
- Map the human resource policies in the port

**Labour**

- Municipality
- Full

**Ambition**

In 2030, businesses operating in the port can attract skilled personnel at all levels. Work in the port is popular and education is well aligned with demand.

- Municipalities
- Full

- Stadsregio Rotterdam
- Municipality

- PoR
- Municipality
In 2030, the port of Rotterdam is an international leader in the development and application of innovations which contribute to sustainable and efficient supply chains and the safety and accessibility of the port complex.

In 2030, the port of Rotterdam is an international leader in the development and application of innovations which contribute to sustainable and efficient supply chains and the safety and accessibility of the port complex.

#innovation

INCREASE THE QUALITY OF EDUCATION AND RESEARCH

- Continue part chairs and lectorates at the universities in Rotterdam and Delft
- Perform applied research based on concrete questions from the business community

INCREASE THE POSSIBILITIES FOR APPLICATION OF NEW INNOVATIONS

- Strengthen the cooperation between the business community and knowledge institutes
- Stimulate young entrepreneurs to start a business in the port
- Create special test sites for the development of innovations under favourable conditions

SETTING INNOVATION PRIORITIES

- Transition to bio-based industry green chemicals
- Increasing the efficiency of land use
- Increasing the efficiency in industrial processes
- Smart traffic and modal shift management for road, rail and barge
- Optimising and further digitising the logistics chains
- Increasing the sustainability of all transport modalities
- Carbon capture, transport and reuse
- Sufficient supply of qualified young people to fill jobs in the port

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In 2030, Europe has a dynamic economy characterised by the absence of internal borders, an extensive network of transport corridors and a level playing field for businesses and ports. A vigorous European policy with powerful institutions in the field of competition, innovation and economic and monetary policy are the cornerstones of a competitive and prosperous Europe.
Port Compass, de Havenvisie 2030, beschrijft hoe het Rotterdamse haven- en industriecomplex in 2030 koploper is op het gebied van efficiency en duurzaamheid, haar positie daarmee versterkt, en zo in 2030 een belangrijke bijdrage levert aan de welvaart van de regio, Nederland en Europa.

De elkaar versterkende logistieke en industriële pijlers ontwikkelen zich tot respectievelijk een super efficiënte draaischijf voor bestaande én nieuwe ladingstromen (de zogenoemde Global Hub), en een hypermodern energie- en chemiecluster dat steeds schoner en duurzamer wordt en op wereldniveau kan blijven concurreren (Europe's Industrial Cluster).

Deze Havenvisie zet uiteen dat in 2030 Maasvlakte 3 niet nodig is, dat de haven dan schoner, stiller en veiliger is, dat de A15 niet meer in de file top 10 staat, de werkgelegenheid in de haven is toegenomen en dat de scheepvaart efficiënter verloopt.

Daarvoor moet met name de transitie naar meer biobased chemie en hernieuwbare energiebronnen goed op gang komen, de energieopwekking verduurzamen, CO2 worden afgevangen en opgeslagen, de Antwerpse en Rotterdamse industrie meer met elkaar verknoopt raken, de efficiency van de logistiek omhoog gaan, een sterk logistiek achterlandnetwerk ontwikkeld worden, voor de bereikbaarheid van de regio pro-actief verkeersmanagement én de Blankenburgtunnel gerealiseerd worden en de overlast voor de regio sterk verminderd worden. Innovatie en het flink opvoeren van het tempo waarmee wordt ingespeeld op kansen en bedreigingen zijn daarbij wezenlijk.


Meer informatie op www.portofrotterdam.com/portcompass
Credits

15 December 2011

Publication
Port of Rotterdam Authority

Text
Port of Rotterdam Authority, with the help of various ministeries, businesses and research institutes

Design
Smidswater, Breda / Den Haag / Amsterdam

Charters Chapter 5
De Argumentenfabriek, Amsterdam

Go to www.PortofRotterdam.com/portcompass for an interactive edition of the Port Vision 2030 and for more background information.