

# Port of Rotterdam: a port of pioneers



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Rotterdam is a port of pioneers. It always has been. It has a long tradition of applying ground-breaking technologies and processes. From the 'crazy' plan of Pieter Caland in 1862 to construct the New Waterway, to the high tech Euromax Terminal and the world-leading information exchange system Portbase. Innovation flows through the Port of Rotterdam like the water of the New Meuse which runs through the city.

Innovation has done us well. The port has grown to become the largest in Europe with an annual transshipment of some 450 million tonnes per annum and nearly 30,000 vessels mooring per year. This is the result of the constant effort to find how things can be done more efficiently, better and more sustainably. We want to stay ahead of the pack and be able to make a difference; this is why Rotterdam remains the 'smartest' port in the world.

## Family, friends and future

Recently, we started 'The Smartest Port'; a robust, cohesive, border-expanding programme. Through The Smartest Port we facilitate, initiate and spur on innovation, together with businesses and knowledge institutions. Besides that, we want to ramp up innovation within our own Port Authority; therefore the programme has three mainstays: family, friends and future.

## Innovation Forum

Through our 'family' initiative we innovate together with companies that are based at the Port of Rotterdam. The most concrete part of this is the Rotterdam Mainport Innovation Forum in which 30 CEOs from large and small port businesses participate to get mutually innovative projects off the ground. For example, together with Rheintrans, Shell, Maersk, the Harbour Coordination Centre and the pilotage, we are working on Dynamic Nautical Accessibility Rotterdam (Dynar). This is an online tool that makes the maximum draught to berths

precisely visible, enabling 99% of vessels to take greater amounts of cargo.

## Incubator

With our 'friends' programme, we look at the world as the day after tomorrow. The international advanced technological dynamism of the Port of Rotterdam is the perfect incubator for start-ups. It is the place where innovative new companies have ample opportunity to develop, test and hone ideas in order to successfully launch them on the market. The Port Authority participates not only actively in incubators and accelerators like PHIA, YES!Delft, Startup Bootcamp Rotterdam and the Havenfonds, but also actively supports promising newcomers.

## Blue piling

We are proud for example of Holland Container Innovations which has developed the first 40-foot collapsible container that meets all the requirements of industry. But also of Fistuca, which uses water via the Blue Piling Technology for hoisting work in offshore operations. Or 'BLIS' for that matter, the Inland Shipping Berth Information System, which allows inland vessels to see in one glance on a digital map where berths are available. The corresponding app is in development.

## SmartPort

Our third innovation mainstay is 'future'. We as port authority consistently invest in education and research. A nice example of this is SmartPort. In this joint-venture between Deltalinqs, the Port of Rotterdam Authority, the municipality of Rotterdam, Erasmus University of Rotterdam and the Technical University of Delft, scientific researchers and innovative companies work together to bring opportunities for the future within reach.

By means of our three innovation mainstays we are working to innovate the entire breadth of the Port of Rotterdam. However, within that, we have picked our

five top themes which present the greatest opportunities and have our focus.

## 1: Biobased and refinery

In this area, we follow a dual-track policy. On the one hand, we are looking for possibilities to further strengthen the existing petrochemical cluster in Rotterdam via innovations. On the other hand, we support the development of bio-based chemicals and fuels. A nice example is the Heat Rotary. Residual heat from the petrochemical industry in Rotterdam is used to heat houses and greenhouses in South Holland. The industry saves money because less gas has to be used for cooling. This is also a great plan in terms of sustainability because there is a substantial reduction in both energy consumption and emissions of harmful substances.

We also foresee a bright future for bio-based industry and want to further consolidate our leading position in this area. To make this possible, an 80-hectare area at Maasvlakte 2 has been developed, specially geared as an innovation in the chemical industry that uses biomass as a raw material. The 'Plug&Play' concept is unique in this field. In cooperation with specialised vendors such as E.ON, Vopak, Stedin and Evides, we have already invested in industrial infrastructure, so bio-based businesses can concentrate on their business and do not need to free up any capex for matters such as tank storage, energy networks, wastewater systems and steam boilers. This results in investment costs that are 30 to 40% lower.

## 2. Offshore and decommissioning

Our aim is to become the offshore hub of North-western Europe for, among other things, the dismantlement of drilling rigs and the construction of wind farms. This will only be possible if we know how to service that industry at the top level by means of smart and efficient innovations. It will not have escaped anyone's attention

Left: Installing the Blue Piling Technology of Fistuca at Maasvlakte II



that the 382-metre long platform installation and decommissioning vessel Pioneering Spirit is being completed in the Rotterdam Prinses Alexia Port. It was also recently announced that Sif Group, Verbrugge International and the Port Authority have signed an agreement for the construction of a production, storage and transhipment terminal in Rotterdam. On some 42 hectares, monopiles (steel foundations) will be produced for offshore wind farms and the oil and gas industry.

### 3. Sustainability

The Port of Rotterdam strives to be the most sustainable port in the world. At this time, there are 200 Megawatts (MW) worth of wind turbines set up in the Rotterdam port area. That is some 10% of the total wind energy capacity in the Netherlands. In our Port Outlook, the Port Authority agreed with various partners that the total configured capacity in 2020 will be 300 MW. Rotterdam is well on its way to realising its ambitions to be the sustainable energy plant of North-western Europe.

Rotterdam is also leading Europe in the introduction of LNG as a fuel. The port is taking a leading role in amending regulations and installing the required infrastructure and is thereby serving as an example for other ports. Since 2014, the port authority regulations of Rotterdam were amended, so we are the first port where ship-to-ship LNG bunker services by seagoing vessels are officially permitted. Truck-to-ship bunker services of inland vessels was already possible before that.

Another example of the use of our innovative power for increased sustainability is the development of 'We-nose'. Many types of substances are used at the Port of Rotterdam that can unintentionally be released. Some gases are dangerous or a nuisance and not all gases can be detected by human perception. An 'e-nose' measuring instrument is capable of this and responds to changes in the air composition. The Port of Rotterdam has a unique series of 152 of these sensors that are connected, comprising the We-nose network. This network is offered as a service to the companies in the port to effectively combat odour nuisance and to provide early detection of the release of hazardous substances.

### 4. From data to information

Big Data and the Internet of Everything are initiatives at the cutting-edge of contemporary port operations and we use the development of the internet and digital applications for, among other things, port call optimisation. For the shipping industry, the stakes are high: delays or inefficient utilisation of vessels can make a huge financial difference. In order to plan a vessel's trip as effectively as possible, shipping companies need detailed information regarding depth, admission policy and arrival and departure times. At the moment, ports are communicating this information in different ways. Shell, Vopak, Maersk, CMA CGM and the Port of Rotterdam Authority have therefore joined forces to create a new, internally accepted standard for the informational exchange of nautical information and planning, entitled Avanti and Pronto.

The web portal Avanti provides information regarding ports across the globe. Avanti is focused on master data like depth and admission policy. By improving the quality and the simple availability, the application provides certainty about berths and clarity about when it is safe to sail into or out of port. Pronto is a communications platform that helps agents and other operators with the planning of services for ships. Via Pronto, all parties can share services around the ship, such as pilotage, terminals and bunkering services. In other words, port call optimisation optima forma.

However, we have also grasped onto the new digital reality recently to make intermodal possibilities for transport to and from the Port of Rotterdam much more transparent. Via the InlandLinks website, inland terminals, empty depots and rail and barge-operators are easy to find. The associated route planner displays the best intermodal routes based on starting and ending point. InlandLinks enhances the transparency of intermodal transport via various tools and is a unique instrument for the logistics industry.

### 5. Smart industry

Finally, we actively support the development of smart industry in our port. An example of this is the pilot '3D printing of maritime spare parts',

which we have initiated together with InnovationQuarter and RDM Makerspace. In the autumn of 2015, we will have ship parts such as propellers, gaskets and liquid ducts 3D-printed and tested to see if they can withstand the requirements of the tough practice of shipping. The results of this will be included in the development of a 3D-printing centre in the Port of Rotterdam, with which shipping companies can be quickly served to measure in the future.

The examples named in this article are just a selection. However, this does paint an accurate picture of the fact that we find innovation essential to the future of the Port of Rotterdam and thus for the city and all of the Netherlands, as well as for the competitiveness of Europe. Not innovating for the sake of innovating, but modernisation that offers concrete benefits to our clients in the port, the visiting shipping companies and other transporters and surrounding residents.

### About the author

Paul Smits was born in 1963 and is Chief Financial Officer at the Port of Rotterdam Authority. He is responsible for finance and financing, information supply, risk management and the quality of decision-making regarding port investments.

### About the organisation



Rotterdam is the entrance to Northwest Europe. From apples to cars, from computers to feedstock for the chemical industry; all of it is transported via the port of Rotterdam. Over water and over land, goods find their way to some 500 million consumers in Europe. It is transported by inland vessels, trucks, trains, pipelines or seagoing vessels. The Port of Rotterdam's annual throughput amounts to some 450 million tonnes. This makes the Port of Rotterdam the largest port in Europe.

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