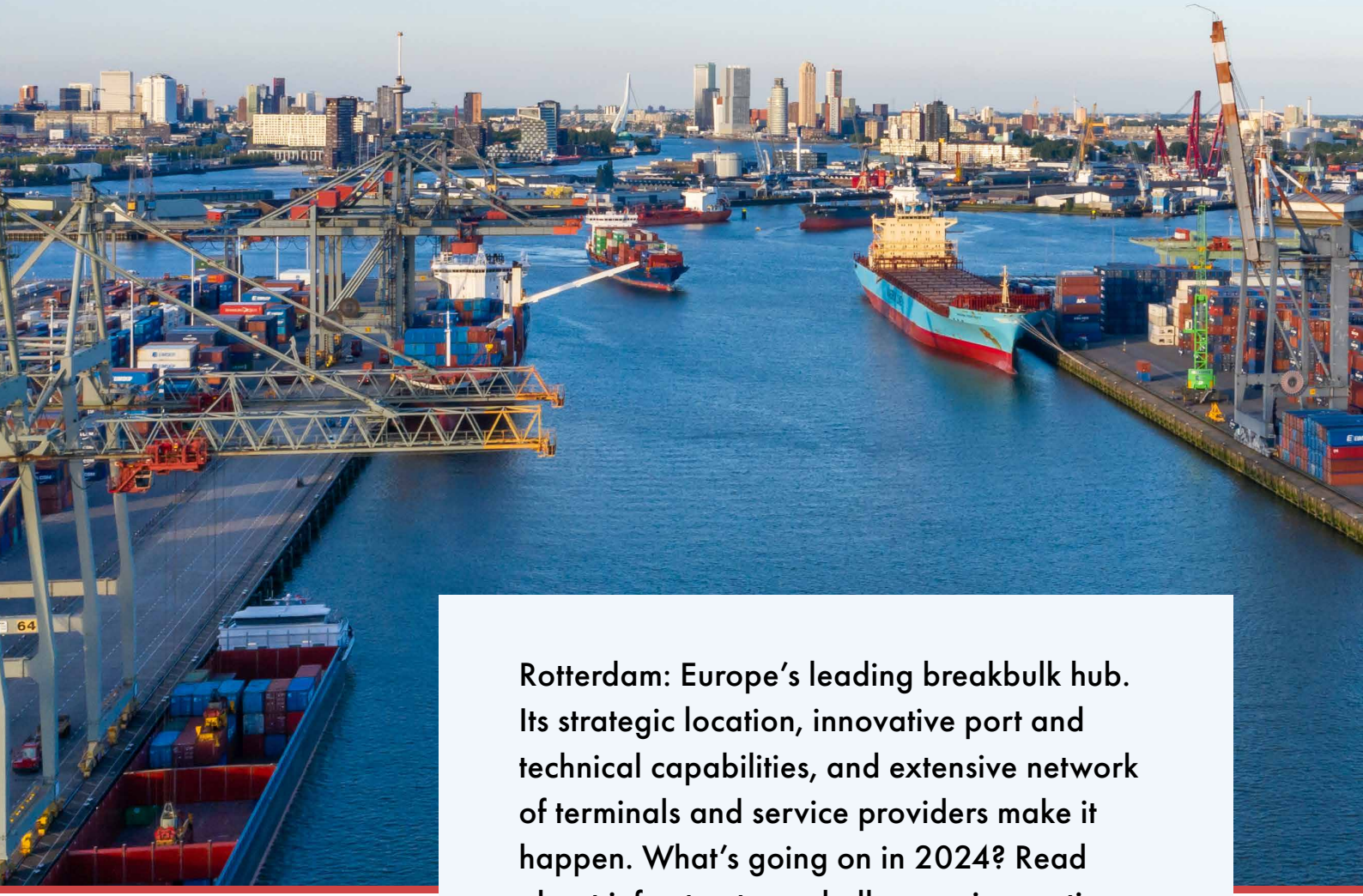
WHITEPAPER

Breakbulk Developments & Opportunities

2024 UPDATE ON DEVELOPMENTS IN THE ROTTERDAM REGION



Rotterdam: Europe's leading breakbulk hub. Its strategic location, innovative port and technical capabilities, and extensive network of terminals and service providers make it happen. What's going on in 2024? Read about infrastructure, challenges, innovations and more in this paper.

ROTTERDAM.
MARITIME CAPITAL OF EUROPE.

Supporting the Breakbulk industry

"Uniquely, the port of Rotterdam houses and supports both small, specialised family-owned companies and the (head) offices of many large multinationals, terminal operators, shipping companies, cargo owners, suppliers, agencies and start-ups. That is quite unique. Unlike some other markets, breakbulk is still very much a 'people business'. And one that we're creating more space for: the move towards sustainability literally takes up a lot of space and we're preparing to accommodate its growth."

Twan Romeijn
Business Manager Breakbulk & Offshore Industry, Port of Rotterdam

"Together with our sister company Royal3D, we offer large scale industrial 3D printing solutions using fiber reinforced thermoplastics. With our large printers we can 3D print - and have done so - transport cradles for breakbulk cargo, for example vessel hulls, thrusters, and potentially even monopiles. These cradles can be rented or bought, come with full material traceability, and a deposit scheme for a refund for the used material, comparable to plastic bottles. In addition, they're strong, lightweight, shock-absorbing, and most important: circular."

Fulko Roos
Managing Director, Royal Roos

"In this sector, people are quite open, there's a high degree of reciprocity. We operate in an ecosystem where many companies in the supply chain have a lot to offer each other and one has the greatest chance of finding skilled staff."

Marco Hoogendoorn
Commercial Director, Holland Shipyards Group

Breakbulk facilities

The heart of 'everything breakbulk' in the huge and closely connected industrial ecosystem along the Dutch Maas and Merwede river systems is the port of Rotterdam. It contains, operates and manages facilities to handle any type, size or weight of breakbulk and heavy lift cargo. To remain attractive, the Port of Rotterdam Authority is also investing in new facilities, both in a physical sense (project areas, quaysides etc.) as well as to services and suitable regulations.

Additionally, Rotterdam's strategic location, right in the delta between the North Sea and the mouths of the Rhine and Maas rivers, makes it accessible from all sides and with all means: vessels, trains, trucks, and planes. These features not only make it Europe's largest port, but also the gateway to the European hinterland.

BREAKBULK HUB

As Rotterdam can handle any vessel type of any size, it is also Europe's most diverse and efficient breakbulk cargo hub, notably for:

1. Heavy lift and project cargo
2. Steel
3. Non-ferrous metals
4. Forest products
5. Offshore/Offshore Wind
6. Automotive (RoRo)

A full-fledged ecosystem has developed around these six main markets, connecting shipping companies, shipyards, repair yards, technical suppliers, terminals, logistics service providers, offshore wind and oil & gas operators, agencies, research institutions and universities.

Check out the main terminal operators, (RoRo-) shipping lines and breakbulk service providers here.

"Rotterdam has a diverse portfolio and the largest choice in terminals. Together, the breakbulk businesses in and around the port can handle any amount and type of small and large project cargo, including, for example, storage, mobilisation, transport and assembly. But also technical-, legal-, tax- or customs-related services," says Twan Romeijn, Business Manager Breakbulk & Offshore Industry at the Port of Rotterdam Authority.

"Any cargo that is not shipped in a container and is shipped as a unit, is what we call breakbulk. Every cluster in that industry has its own needs. We make sure those needs are met. For example, we have recently developed extra acres of working space for steel, non-ferrous metals and project cargo. The specialised terminals, such as Access World, Broekman, JC Meijers, Matrans, Metaal Transport, RHB, Rhenus, SIF, Steinweg, or Westerstuw, make sure that the quality and safety levels for these sensitive and high-risk cargoes are the highest in the world".

SUSTAINABILITY

Indeed, the port of Rotterdam invests in green supply chains, providing incentives and rewards for companies that actively engage in addressing and minimising industry-related climate change. Considering the actual and expected growth of the breakbulk market, and because of many new rules and regulations, this is also a necessity.

A positive impact on the environment

Twan: *"The energy transition literally takes up space. For example, an important industry player is currently renovating its premises, there's a lot of project cargo that needs to be built, transported, stored and delivered. Projects like these are labour intensive, generate jobs and produce a large added value. And the breakbulk industry is also connected to other industries, such as recycling, maritime, offshore and industrial processes. Furthermore, we have a few new 'green steel' manufacturers coming into the market. This, of course, will change the manufacturing of raw materials which will have a positive impact on the environment."*

Other initiatives aiming for a more sustainable shipping and breakbulk industry are: shore power infrastructure, electrical cranes and forklifts at terminals, rooftop solar panels, using recycled materials in (heavy) equipment, and experimental Offshore Floating Solar energy systems.

CHALLENGE

According to Twan, one of the challenges that must be overcome is to **make (steel & non-ferrous) production more sustainable**. Not only because of the energy transition, but also because clients actively ask for this. And there's more to take into account for players in breakbulk; especially considering global political and economic developments (see 'Future scenarios and challenges' below).

One of the solutions comes from Royal Roos, a marine engineering, design and consultancy company for sustainable retrofits, as well as offshore (de) mobilizations. Note that, while the port ever expands seaward, there is still lots of activity in the city's centre too. With their own quayside and shore power facility in the 'Merwehaven' area, Royal Roos is easily accessible by land and water.

There, the team of engineers focuses on green solutions and in-house innovations, such as wind-assisted propulsion systems, shore power solutions, air lubrication to minimize fuel consumption and lower emissions, and manufacturing equipment for the offshore, offshore wind, breakbulk and heavy lift industries – if possible with reusable materials.

Focusing on breakbulk and project cargo, Royal Roos stepped up to the challenge. *"We've designed a market-ready concept for* **3D printed cradles for offshore wind components**, *using extremely strong but still recyclable materials"*, says founder and Managing Director Fulko Roos.

We can 3D print various structures on a large scale with our 8 x 4 metres and 4 x 2 metres capacity printers. With them, we manufacture solid structures using fiber-reinforced thermoplastic materials. Unlike thermoharders (used for wind blades), thermoplasts can be shredded and melted - using a relatively low amount of energy. Being able to recycle the raw material got us looking into reusable products as well."

So, the company started with tailor-made recyclable cradles and saddles for parts used in the offshore wind industry. Cradles that the client can deliver back to Royal Roos after the project. That concept opened the door to other products. In offshore wind, for example, the transport frames for wind blades must have the exact form of that particular type. Operators often have to make expensive steel adaptors to fit the blades in their onboard transport frames. These adaptors can now simply be printed, taken back, shredded, melted and printed again for a different type of adaptor.

"We are now researching other applications. A promising development is printing tools for the 'nesting' of breakbulk cargo in cargo holds, on tweendecks or in crates. These printed parts allow for more efficient nesting, creating valuable extra storage space per crate. We are already in talks about this, even with high-end heavy lift operators. Another one is getting rid of the use of expensive, environmentally unfriendly hardwoods when filling up the sides of your flatrack. Also, hardwood parts need to be modified first, to make it fit, a time-consuming exercise. Better to print these parts directly into the right shape with a money deposit system as an added bonus: use, return, reuse."

Yet another argument for these thermoplasts is the fact that they weigh much less than steel or hardwood. And the possibilities seem endless. Fulko: *"The latest development is to* ***containerise project cargo cradles by printing inserts****. This makes the process even easier. You take a standard container, 3D print a recyclable insert and you end up with an easy way to transport 60- to 80-tonnes wind blades. Again, the containers loaded with used inserts can be returned and reused after your project is done."*

ECOSYSTEM

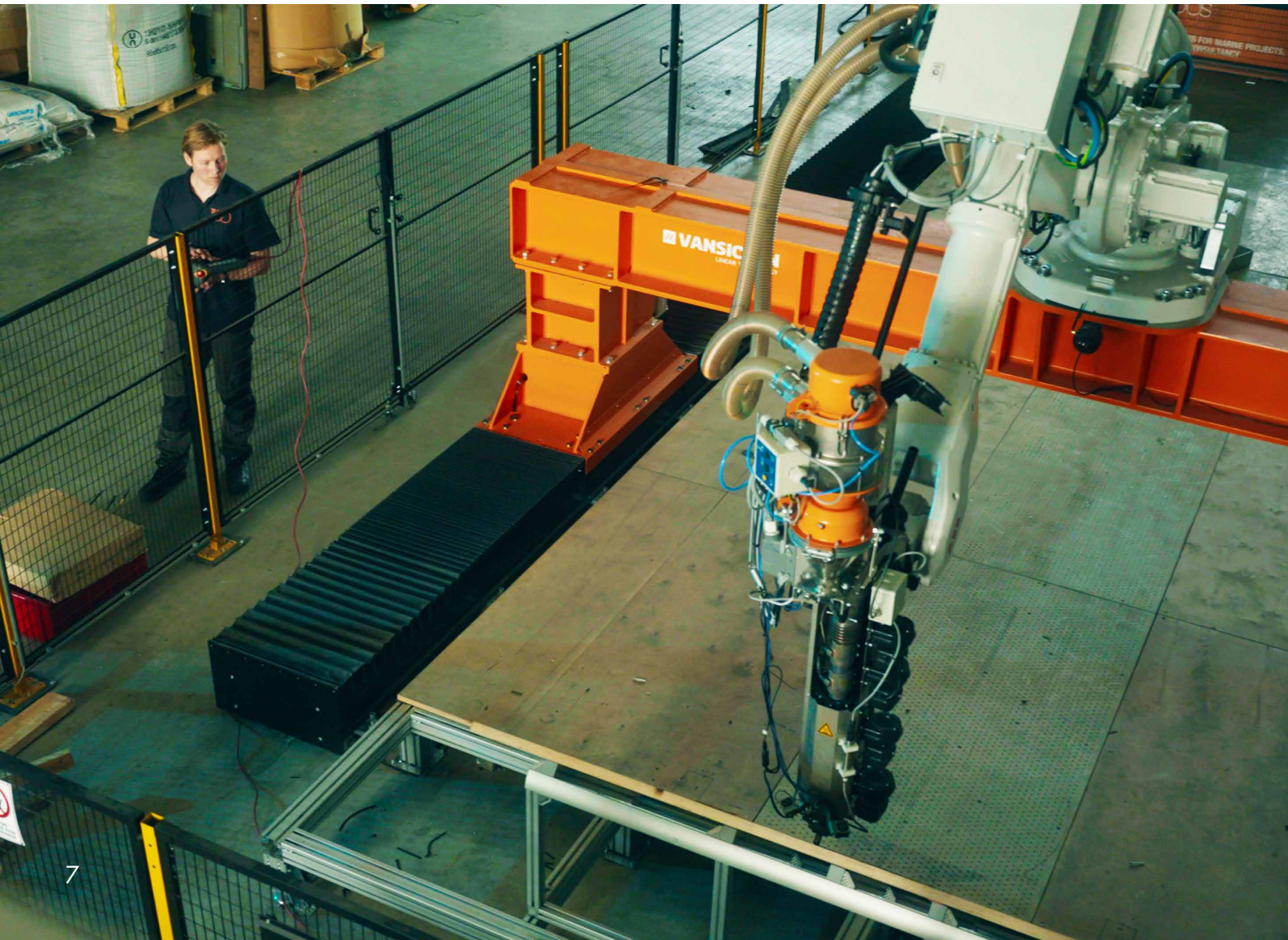
On the breakbulk ecosystem, Fulko says; *"Rotterdam is the perfect environment for us, because everything we need to make our smart shipping ideas work is here. From the Port of Rotterdam Authority to the City of Rotterdam, everyone has the same goal and is willing to help one another to achieve that mutual goal. Personally, I like to think even bigger and draw a circle of 400 kilometres around Rotterdam. That is an incredibly interesting region in Europe – and all players are in it. From companies like Maersk and Ørsted to the tiniest supplier in the breakbulk supply chain, and including factories, engineers, terminals, shipyards, start-up accelerators, consultants, lawyers, engine suppliers and much more. Rotterdam is truly an 'all-inclusive' hub. And last: building and manufacturing is getting more competitive compared with Asia than a few years back."*

Are you ready for the future of the Maritime Industry?

Future scenarios and challenges

What does the future have in store for the breakbulk market? What will be its incentives, market influences, its cargo types? To understand this, the Port of Rotterdam Authority has drawn up 4 scenarios, all of which have their own feasibility and dynamics.

As Business Manager for the regional breakbulk market, Twan expects the demand for raw materials to grow, whichever scenario plays out in practice. From his point of view, he rather speaks of a 'raw materials transition' as a result of the energy transition. Reusing raw materials and recycling half-fabricates will become more important and the Port of Rotterdam Authority works together with the Dutch Research Institute for Transitions to understand and publish about developments, opportunities and news ways of working.



Summarised, the 4 scenarios are:

CONNECTED DEEP GREEN

Stable geopolitical relations and global co-operation. GDP and trade growth and heavy investing in renewable energy are the drivers, positively impacting breakbulk.

REGIONAL WELL-BEING

Modest economic growth because of trade barriers and diverging CO2 measures between countries/ regions. In this scenario throughput of breakbulk cargoes represents the strongest growth.

PROTECTIVE MARKETS

Geopolitical tensions and mistrust; competing economic interests in a fragmented world. Negligence of climate policies. Breakbulk demand in construction and industry is modest and the lowest of all scenarios.

WAKE-UP CALL

Increasing concerns about the (economic) consequences of external shocks like extreme weather, food and fuel availability lead to a turning point from 2030 onwards. Radical increase in energy transition. The transition to a sustainable, fossil free society will start only after climate related disasters lead to a strong response. Revival of world trade, but high transport costs put a break on the growth in breakbulk.

All these scenarios are possible and together with several scientific institutions (e.g. Erasmus University Rotterdam, Delft Technical University), the breakbulk team monitors their developments and shares them with companies and stakeholders in the industry.

If you want to understand these prognoses and use them for your own future plans, download the entire whitepaper here and check out the webpage. You can even get in touch with Twan and ask him yourself!

In conclusion, Twan says: "What makes us – that is, the breakbulk ecosystem – unique, is that we have so many companies, partners and stakeholders in the region and have the will and the means to bring them closer to each other in order to solidify our and their market position."

One member of this ecosystem, shipbuilder Marco Hoogendoorn, agrees: "Many operators have their headquarters in this region. Some of them build their ships, or at least the hulls, in China. However, we see that **more and more shipowners want to work with an affordable partner in their own backyard**, especially for outfitting and finishing. It means that they can keep a close eye on their newbuilds – they can simply come by the yard and see for themselves. That makes the process much more efficient, and, as a bonus, nicer. Having regular face-to-face contact is good for mutual understanding and building strong relationships. And that has a very positive effect on the shipbuilding process itself. In addition, there's a whole, high-quality cluster of suppliers and subcontractors close-by: Rotterdam, Dordrecht, Werkendam, Gorinchem, Schiedam, Sliedrecht etc. **Any specialist you need is located on a maximum one-hour drive from the yard**. Talk about an efficient ecosystem!"

A shipyard's perspective

Another perspective on breakbulk comes from shipbuilder Marco Hoogendoorn, Commercial Director of Holland Shipyards Group in Hardinxveld-Giesendam and located on the eastern side of the greater port region.

His team is currently building 5 tweendeckers designed by Conoship (of 3,800 dwt each) and 2 general cargo vessels of a typical Dutch variety: the kruiplijner. These low air-draft cargo vessels are built in such a way that they can pass under river-spanning bridges, but are also allowed to sail along the western European coastlines.

Marco sees two main challenges in the coming years. One is **attracting new personnel**, both highly skilled professionals and people with a practical inclination.
To this end, Rotterdam makes it a top priority to attract and develop talents to remain of the world's best maritime education ecosystems. The universities in the region are ranked among the best in the world. Besides Erasmus University and Delft University of Technology, the Rotterdam University of Applied Sciences has a dedicated maritime faculty and the headquarters of the STC Group, one of most international maritime education and training institutes in the world is, located in Rotterdam. Also, it is an attractive region for workers from abroad, as there are sufficient facilities to live a good (family) life.

The other challenge is **securing innovations**. Marco: *"Currently, for example, we're building two hydrogen-propelled vessels. That is a new game and the knowledge we gain in the process needs to be internalised, secured in our organisation, not just in the minds of the people involved."*

> **It's crucial to step up and secure these new developments**

"Together with our regional partners, we've been able to double our revenue by doing things that put us at the forefront of shipbuilding", continues Marco.

"3D printing of an entire water taxi, engineering and installing hydrogen propulsion systems, building full-electric vessels, using recycled materials, you name it, we are doing it. Now it's crucial to step up and secure these new developments, both organizationally and in terms of knowledge."

START-UP COLLABORATIONS

To get even further ahead and be able to serve breakbulk and project cargo operators even better, Holland Shipyards Group has started to work with a number of start-ups, and smart shipping consortia and programmes, such as RoBoat, Smart-Ship, 10XL, and Royal3D (part of Royal Roos).

"We call this the SpaceX way of innovating. We're not only waiting for clients to ask for green ships or sustainable technologies, but are actively looking for them and invest in experiments and partnerships, often building minimum viable products. That's how we like to work: try, see what works, learn, go to market."

Several of these partnerships are with customers, designers and suppliers, as is the case with the Wind-Assisted Propulsion designs of Conoship, Econowind and their clients, among others Multi-Purpose operators. Marco believes that it's now an opportune moment for cargo owners to also play a bigger role in the technological and environmentally-related changes in this market.

It's now an opportune moment..

Join the Rotterdam Breakbulk Community

Looking to connect with likeminded people and industry colleagues? There is an active community that welcomes you as a fellow breakbulk professional.

This group of companies is supported directly by the Port of Rotterdam Authority and the Rotterdam Port Promotion Council and aims to strengthen collaboration, knowledge sharing and business for its members.

The Breakbulk Community and its members organises relevant network and knowledge events, company visits and trade fair participation, the most important fair being the Breakbulk Europe exhibition.

BREAKBULK EUROPE

Breakbulk Europe has proven to be an important addition to the Rotterdam maritime and breakbulk ecosystem. With around 600 exhibitors, 11,000 visitors from 126 countries and a conference programme this event is currently the largest exhibition for the global project cargo and breakbulk industry. Hence, this 3-day event is as good a reason as any to visit Rotterdam – the port and the city – and get updated on breakbulk matters.

Why Rotterdam?

Regarded as Europe's maritime heart, the region – from Hook of Holland to Gorinchem and everything along the Maas and Merwede rivers – exudes a strong maritime presence and attitude.

All essential services are readily available; not only terminals, shipping companies and manufacturers, but also service providers, including marine lawyers, repair yards, (technical and business) consultants, freight forwarders and investors. Opportunities can be found in abundance and companies thrive in the maritime capital of Europe.

From a terminal perspective, it's one of the port of Rotterdam's ambitions to provide these (existing) storage and assembly companies with the chance to grow. This has a positive impact on the entire supply chain. From a cargo perspective, the Port of Rotterdam Authority is actively looking to attract new businesses to the region, especially (small or large) companies involved in (green) production and manufacturing of raw materials and project cargo. *"We've got the capacity to grow the volume of both project cargo manufacturing and handling, and alternative fuels production in their slipstream",* says Twan Romeijn.

Want to be part of the breakbulk industry in the Rotterdam region?

Please reach out to us via **maritime@rotterdam.nl**
or visit **www.rotterdammaritimecapital.com**.
We will answer your questions and connect you to relevant specialists in the breakbulk ecosystem.

More information

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