

# ACTIVITY REPORT

2019







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# INTRODUCTION





# COMPANY PROFILE

## A global solutions provider

DEME is a world leader in the highly specialised fields of dredging, solutions for the offshore energy market, infra marine and environmental works. We can build on more than 140 years of know-how and experience and have fostered a pioneering approach throughout our history, being a front runner in innovation and new technologies.

While our company roots are in Belgium, we have built up a strong presence in all of the world's seas and continents, operating in more than 90 countries worldwide. We can rely on 5,200 highly skilled professionals across the globe. With a versatile fleet of over 100 vessels, backed by a broad range of auxiliary equipment, we can provide solutions for even the most complex projects.

## Solutions for global challenges

Our vision is to work towards a sustainable future by offering solutions for global, worldwide challenges: rising sea levels, a growing population, reduction of emissions, polluted rivers, seas and soils and the scarcity of natural resources.


Although our activities originated with our core dredging business, our portfolio has diversified substantially over the decades. Our offering includes dredging and land reclamation, solutions for the offshore energy market, infra marine solutions and environmental solutions. Our multidisciplinary capabilities, the synergies in many projects and our integrated corporate structure have made us into a global solutions provider.

## Exploring new horizons

We also strongly believe in turning challenges into opportunities. That's why we are continuously looking for ways to deploy our knowledge and expertise in other activities, exploring new horizons and expanding our solutions portfolio.

We are developing technologies for the sustainable deep-sea harvesting of minerals on the ocean floor. As a leader in environmental remediation, we are looking into solutions for tackling marine litter in our rivers and oceans. We are building on our experience in coastal protection to develop nature-based solutions to counter the rising sea level. Our continued investments in new technologies and activities underline just how important innovation is to our company.

## Shareholder structure

DEME's shareholder is the Brussels-based civil engineering contractor CFE, which is controlled by the Belgian investment group Ackermans & van Haaren – both publicly listed companies on Euronext Brussels. 

# MESSAGE FROM THE BOARD OF DIRECTORS

Overall 2019 was a solid year for DEME with a turnover of 2.62 billion EUR and an EBITDA of 437 million EUR.

With our diversified portfolio, relentless drive for innovation and the dedication of our employees, we achieved some remarkable milestones across our activity lines.

Safety remains our number one priority on shore and at sea. While we work tirelessly to reduce the number of injuries, we strongly encourage our employees to report any near misses or unsafe situations. By understanding these incidents better, we continue to improve safety procedures and stop the same problem happening again.

Safety remains our number one priority on shore and at sea.

Alongside safety, sustainability is also our major priority. We have adopted the United Nation's Sustainable Development Goals where we can really make a difference. Our innovative solutions can make a significant contribution to achieving these goals. Not only do we offer and develop solutions for global megatrends, we also have a continual focus on minimising the impact of our own operations. We believe this holistic approach, where we stimulate initiatives from an external and internal perspective, differentiates us from our competitors.

To further future-proof our organisation and to reflect the steep growth curve our company has experienced over the last few years, we have established and reinforced the structure of our four core activity lines: Dredging, Offshore, Infra and Environmental. Each activity line has its own expertise and highly-skilled specialists, but at the same time the four lines support and reinforce each other.

2019 was characterised by a number of milestone projects and we have also secured a series of new contracts across the globe. We performed a variety of challenging dredging projects. In Germany we have been awarded the prestigious River Elbe deepening and widening project, confirming our technological expertise in complex dredging and marine engineering projects. We are deploying our dual fuel trailing suction hopper dredgers 'Scheldt River' and 'Bonny River'. In Singapore, most of the marine works for the mammoth Tuas Terminal Phase 1 (TTP1) megaproject were concluded. Under this phase, a staggering 88 million m<sup>3</sup> of land has been reclaimed and over the years, TTP1 has been awarded several safety-related awards recognising its top-notch performance.

In our offshore activities we significantly expanded our footprint in Asia.

In Offshore we are particularly proud of the Modular Offshore Grid Project, completed months ahead of schedule thanks to our innovative cable installation and multipurpose vessel 'Living Stone', which features a dual-lane cable installation system. The offshore wind industry is no longer confined to the waters of northern Europe alone. In 2019 we significantly expanded our footprint in Asia, securing a series of contracts and preferred supplier agreements for three offshore wind farm projects in Taiwan. Meanwhile, in the oil & gas market we have been awarded a major

contract to perform rock placement works for a gas pipeline in Taiwan. This represents the first rock installation project for DEME in Taiwanese waters.

Our Infra team has been particularly busy in the Netherlands which has seen three megaprojects get underway – the RijnlandRoute, New Lock Terneuzen and the Blankenburg Connection. The first tube of the 2.2 km bored tunnel at the RijnlandRoute has been finalised and several crucial milestones were achieved at the New Lock Terneuzen, one of which was the construction of a temporary canal. This helps minimise the impact of the works on marine traffic at the existing locks complex.

In the Environmental activity line, our flagship project Blue Gate in Antwerp, Belgium is now well underway. Furthermore, it is a logical step for DEME to use our environmental expertise to find solutions to tackle the plastic soup. We launched an innovative project to deploy a 'marine litter hunter' on the Scheldt River in Belgium. The project combines artificial intelligence, virtual reality and autonomous navigation to detect and collect marine litter.

This project highlights how we turn challenges - often reflected in global megatrends - into opportunities. The marine litter hunter contributes to one of modern day's most pressing issues – plastic pollution – and can ultimately be applied worldwide.

In a first for DEME Concessions, we have become a port authority in the Port of Duqm in Oman. DEME is also partnering with other leading players, including the Port of Antwerp and Port of Zeebrugge, to make a joint analysis of the entire hydrogen import and transport chain. Again, the global megatrend to move away from fossil fuels, has seen DEME take a step into exploring the potential of hydrogen, which is a new arena for our company.

The decision to pioneer and take bold steps into the future is not without challenges of course. In 2019, Global Sea Mineral Resources (GSR), our deep-sea polymetallic

nodule specialist, embarked on an expedition to perform functionality testing of 'Patania II', a pre-prototype collection vehicle. During a test dive all power and communication to the vehicle was lost following damage to a critical cable. Unfortunately, this meant that GSR's mission had to be postponed while the winch and umbilical are re-engineered. Undeterred, GSR is determined to overcome this hurdle and will return to the Pacific in 2020.

Breakthrough innovation and staying ahead of the market with the latest technologies is also reflected in our ambitious, multi-year fleet investment programme. We continually strive for improvements in our productivity and environmental performance. 2019 saw the introduction of a new generation of trailing suction hopper dredgers with the 15,000 m<sup>3</sup> 'Bonny River', which has been making her mark on projects

throughout Europe. This unique vessel is able to dredge very hard soils and can work in deep waters to an impressive 103 m.

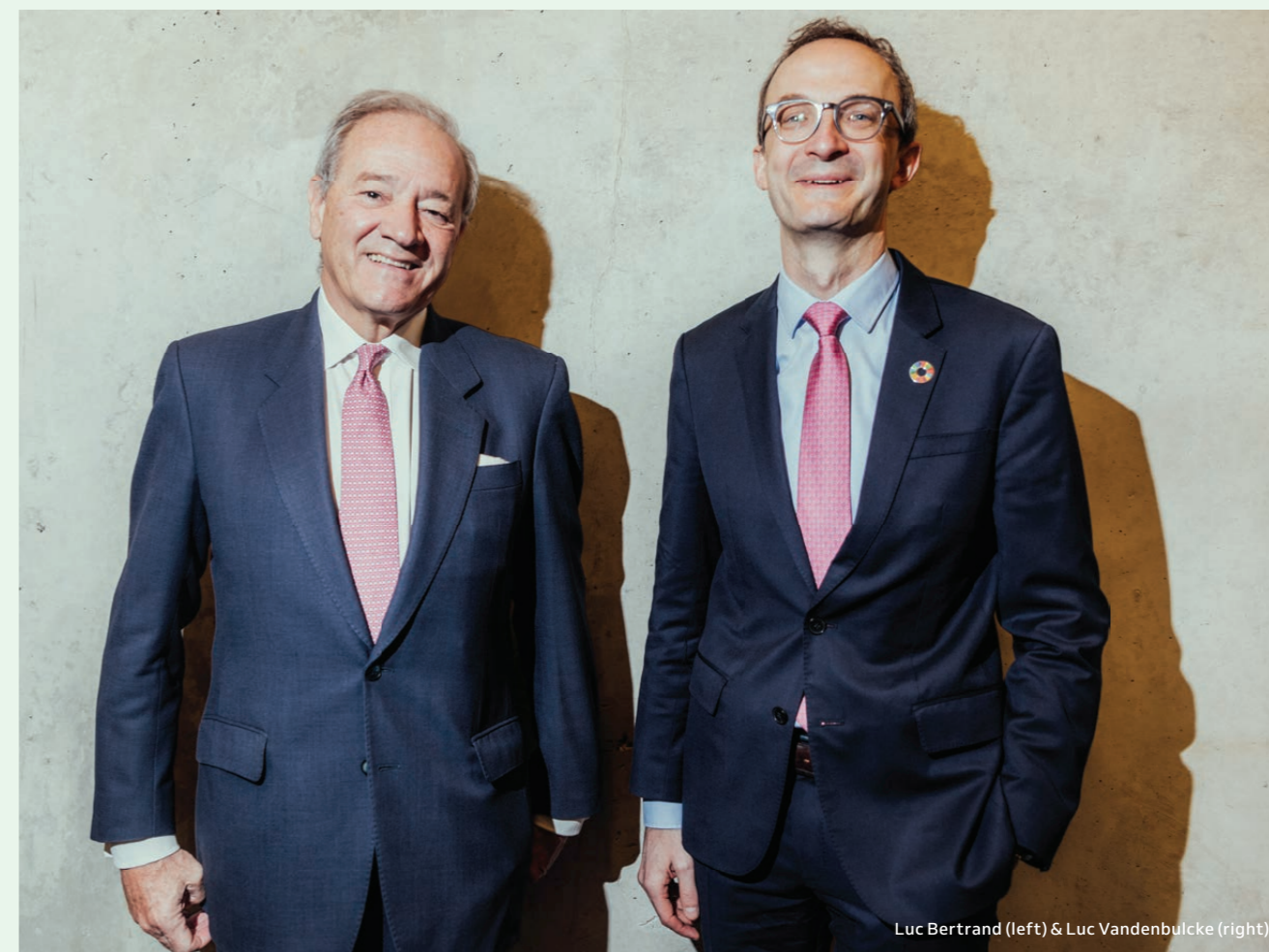
We saw the introduction of a new generation of trailing suction hopper dredgers.

2020 will see us continue to push boundaries and explore potential opportunities. However, at the time of publication of this report, we are in unprecedented times with the COVID-19 pandemic. Our main priority is to keep our employees and partners safe and healthy. We have implemented stringent measures at sea and on shore

and we are doing our utmost to minimise the impact on our projects worldwide. Ultimately, we are nothing without our valued team of 5,200 highly-skilled professionals. They are our strength.

We are always: One DEME, One Team. 🌱

Luc Vandembulcke | CEO DEME Group  
Luc Bertrand | Chairman DEME



Luc Bertrand (left) & Luc Vandembulcke (right)

## OUR MANAGEMENT TEAM



### LOWER ROW, FROM LEFT TO RIGHT

**Amedeo Peyron** | Area Director Middle East and South Asia  
**Eric Tancre** | Managing Director Activity Line Infra,  
 Managing Director Activity Line Dredging  
**Philip Hermans** | Managing Director Activity Line Dredging  
**Els Verbraecken** | Chief Financial Officer  
**Luc Vandenbulcke** | Chief Executive Officer  
**Pierre Potvliege** | Business Development Director  
**Christine Cuyt** | Assistant to the Management Team  
**Steven Poppe** | Area Director Africa  
**Tom Lenaerts** | Chief Legal Officer

### UPPER ROW, FROM LEFT TO RIGHT

**Wouter Borghijs** | Area Director Americas  
**Christopher Iwens** | Area Director Asia Pacific  
**Bernard Paquot** | Area Director Middle East and South Asia  
**Bart De Poorter** | General Manager DEME Offshore  
**Theo Van De Kerckhove** | Chief Operating Officer  
**Bart Verboomen** | Managing Director Technical Department,  
 General Manager Baggerwerken Decloedt & Zoon  
**Hugo Bouvy** | Managing Director DEME Offshore  
**Koen Vanderbeke** | Operations Director DEME Offshore  
**Dirk Poppe** | Area Director Eastern Europe and Russia,  
 Managing Director Activity Line Environmental  
**Hans Casier** | Chief Human Resources Officer  
**Lucas Bols** | General Manager DEME Offshore

## OUR EXECUTIVE COMMITTEE



**Luc Vandenbulcke**  
 Chief Executive Officer



**Els Verbraecken**  
 Chief Financial Officer



**Eric Tancre**  
 Managing Director Activity Line Infra,  
 Managing Director Activity Line Dredging



**Philip Hermans**  
 Managing Director Activity Line Dredging



**Hugo Bouvy**  
 Managing Director DEME Offshore



**Theo Van De Kerckhove**  
 Chief Operating Officer



# FINANCIAL HIGHLIGHTS

## DEME GROUP KEY FIGURES

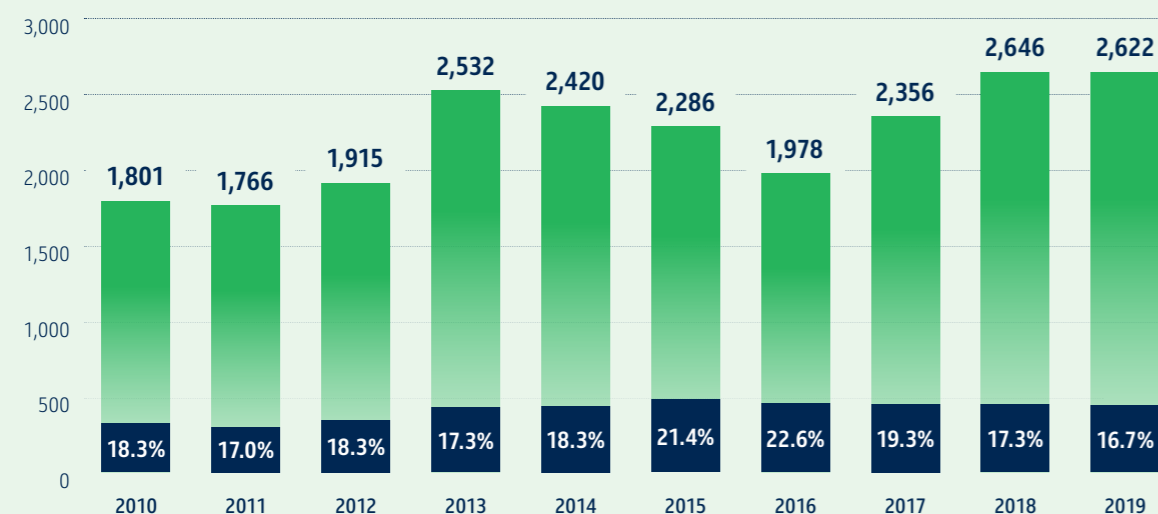
As of December 31  
(in millions of EUR)

	2019	2018	DELTA
Turnover	2,622.0	2,645.8	-23.8
EBITDA	437.0	458.9	-21.9
EBIT	141.1	196.0	-54.9
Net result share of the Group	125.0	155.6	-30.6
Order book	3,750.0	4,010.0	-260.0
Average # personnel (in FTE)	5,089	4,937	152
Shareholders' equity (excl. minority interests)	1,435.5	1,401.4	34.1
Net financial debt	-708.5	-555.8	-152.7
Balance sheet total	3,944.8	3,820.7	124.1
Total investments	446.1	410.2	35.9
Dividend of the year	*	55.0	-55.0

(\*) Due to the COVID-19 crisis and out of caution, the Board of Directors will ask the shareholders at the General Meeting to fully reserve the profit of the financial year 2019. The Board of Directors will evaluate the possibility to distribute an interim dividend by the fourth quarter of 2020 at the latest.

## DEME GROUP EVOLUTION OF CONSOLIDATED TURNOVER AND EBITDA

As of December 31  
(in millions of EUR)



### Definitions:

**EBITDA** is the sum of operating result (EBIT), depreciation, amortisation expenses and impairment of goodwill.

**EBIT** is the operating result or earnings before financial result and taxes and before our share in the result of joint ventures and associates.

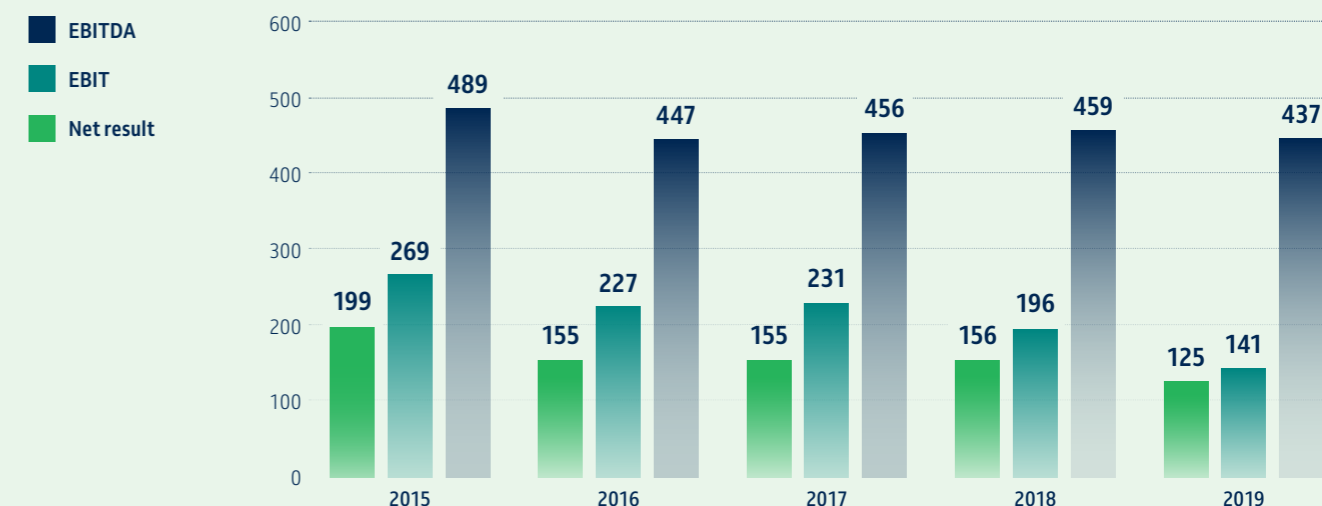
**Order book** is the contract value of assignments that are acquired as of December 31 but that is not yet accounted for as turnover because of non-completion.

**Net financial debt** is the sum of current and non-current interest-bearing debt decreased with cash and cash equivalents.

**Total investments** is the amount paid for the acquisition of intangible, tangible and financial fixed assets, which equals the total investment amount of the consolidated cash flow from investing activities.

## DEME GROUP EVOLUTION OF NET RESULT, EBIT AND EBITDA

As of December 31  
(in millions of EUR)

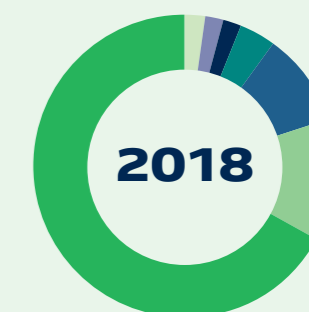
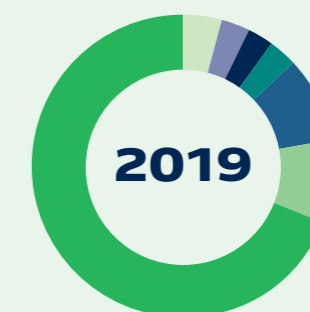


## DEME GROUP TURNOVER BY REGION AND ACTIVITY LINE

As of December 31

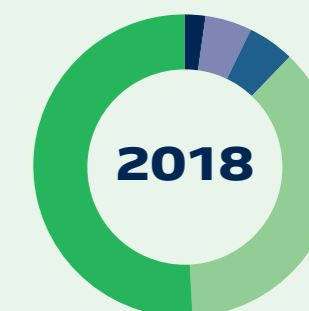
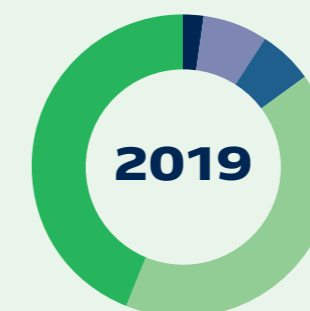
### BY REGION

	2019	2018
Europe - EU	69%	67%
Asia & Oceania	9%	13%
Africa	9%	10%
Europe - non EU	4%	2%
Indian subcontinent	3%	2%
Middle East	3%	2%
America	3%	4%



### BY ACTIVITY LINE

	2019	2018
DEME Offshore	44%	51%
Dredging**	41%	37%
Infra	7%	5%
Environmental	6%	5%
Others***	2%	2%



(\*\*) Of which maintenance dredging 10% in 2019 and 11% in 2018, of total turnover.

(\*\*\*) Salvage works, marine aggregates, concession and deep-sea harvesting activities are represented in Activity Line Others.

# COMPANY OVERVIEW



# SUSTAINABLE DEVELOPMENT

To push sustainable value creation forward, we have established a clear vision, including strategic objectives and targets. We want to continuously challenge ourselves to develop more sustainable solutions within our portfolio and excel in our operations.

We identified eight key sustainability themes that will support us in creating sustainable value. Integrating these ambitious objectives into our day-to-day operations will leverage sustainable growth for DEME and society.

The table below gives an overview of how our two-dimensional strategy interacts with our key sustainability themes.



**CLIMATE & ENERGY**

Drive the energy transition by expanding our offshore energy solutions and by exploring new marine-based solutions for renewable energy production, connection and storage.

Improve adaptation against climate-related hazards by building resilient infrastructure and providing dedicated flood protection solutions.



**NATURAL CAPITAL**

Protect, revive and build natural capital to address key environmental and societal challenges.



**SUSTAINABLE INNOVATION**

Stimulate the development of holistic solutions through multi-stakeholder partnerships to drive the transition towards a sustainable future.



**WASTE & RESOURCE MANAGEMENT**

Drive the resource transition by increasing the sustainable supply of materials.

Accelerate the shift towards a circular economy by providing solutions for waste, soil, water and sediments.



**HEALTH, SAFETY & WELL-BEING**

Develop future-proof infrastructure to enhance prosperity, well-being and a safe environment.



**DIVERSITY & OPPORTUNITY**

Create decent job opportunities to stimulate economic development and reduce inequality.



**ETHICAL BUSINESS**

Conduct business with integrity, to actively and proactively prevent corruption or bribery in any form.



**LOCAL COMMUNITIES**

Increase the resilience of communities to cope with economic, environmental and social challenges.

## EXPLORE SUSTAINABLE BUSINESS SOLUTIONS

"What business do we want to be in and how can we create sustainable growth?"



## EXCEL IN OUR OPERATIONS

"How can we perform in the most sustainable way to leverage business solutions?"



**CLIMATE & ENERGY**

Improve energy efficiency in our operations.

Strive for a climate-neutral organisation by 2050 and reduce GHG emissions in the project value chain.



**NATURAL CAPITAL**

Minimise the environmental impact of our operations and strive for a net positive impact on biodiversity and ecosystems.



**SUSTAINABLE INNOVATION**

Enhance scientific research, upgrade the technological capabilities and encourage sustainable innovation within our projects.



**WASTE & RESOURCE MANAGEMENT**

Maximise efficient and circular use of materials throughout our projects.



**HEALTH, SAFETY & WELL-BEING**

Provide a safe, secure and healthy working environment for all people involved.



**DIVERSITY & OPPORTUNITY**

Ensure an inclusive workplace where all workers are treated equally, with dignity and respect.

Strengthen employee competencies by facilitating talent development and promoting sustainable entrepreneurship.



**ETHICAL BUSINESS**

Respect and protect labour rights in our operations.

Embed an ethical business mindset within the organisation and transparently communicate about our ethical performance.



**LOCAL COMMUNITIES**

Build collaborative relationships with local communities through consultation, engagement and participation.



# PEOPLE @DEME

As DEME continues to grow, our ambitious recruitment drive was ongoing throughout 2019. More than 400 crew and staff joined our company, which is particularly impressive given that there is a very competitive market for the kind of quality people we want to work with. We have been able to meet the recruitment challenge ashore and on our vessels, where we are still managing to attract the best people from captains to second mates.

Given the arrival of our giant new CSD 'Spartacus' and offshore installation vessel 'Orion' in 2020, it was crucial to be able to secure a great team with the right education and certification.

## Internationalisation and diversity

2019 is marked by DEME's increasing internationalisation as our recruitment drive seeks people from all corners of the globe. Currently, we have more than 80 nationalities working for DEME and our diversity is also improving, with more and more women joining our ranks.

## State-of-the-art induction process

With our climbing numbers we recognise that it can be pretty overwhelming for our managers to have enough time to help the

new recruits settle in, so this year we have rolled out a new onboarding programme as a pilot in the Benelux. This is a state-of-the-art induction process and enables people to get familiar with the organisation way in advance of their start date. We send information to the new employees to bring them up to speed before they start and for at least six months after they have joined the company.

On top of that, we have improved the quality of our 'Welcoming Day' for new employees, which we typically hold twice a month and our 'Basics for Starters' programme, which provides a good helicopter view of DEME today. In November 2019, we had our 100<sup>th</sup> Basics for Starters session,

again with people attending from different countries and a diverse range of positions. This is a great way for our new people to start to develop their own 'mini DEME network'.

In 2019 we also held a two-day 'Captains & Chief Engineers Summit'. This was a great success and is important for our captains and chief engineers to share experiences and meet each other.

## Leadership

Another initiative this year concerns leadership capabilities. At HR we are always astonished by the collective IQ and brainpower of our people, but we understand that we need to make sure we are future-proof by taking a closer look at our leadership capabilities and succession management. Peer group reviews are encouraged so managers get more feedback regarding their leadership expertise. And vice versa, we are asking our managers to give more management recognition and show their people how their efforts are appreciated. DEME is such a busy company this is sometimes overlooked.



## Career management

Career management has also been a focal point this year. We need to make sure our people are being developed properly to prepare for management positions, for example. DEME is such a diverse group with its four core activity lines that it is perfectly possible to have a lifetime career within the company although employees may work in very different sectors over the years. We want to make sure that people have the ownership of their career in their own hands and during 2020 HR will provide more transparency about how to develop a long-term career at DEME.

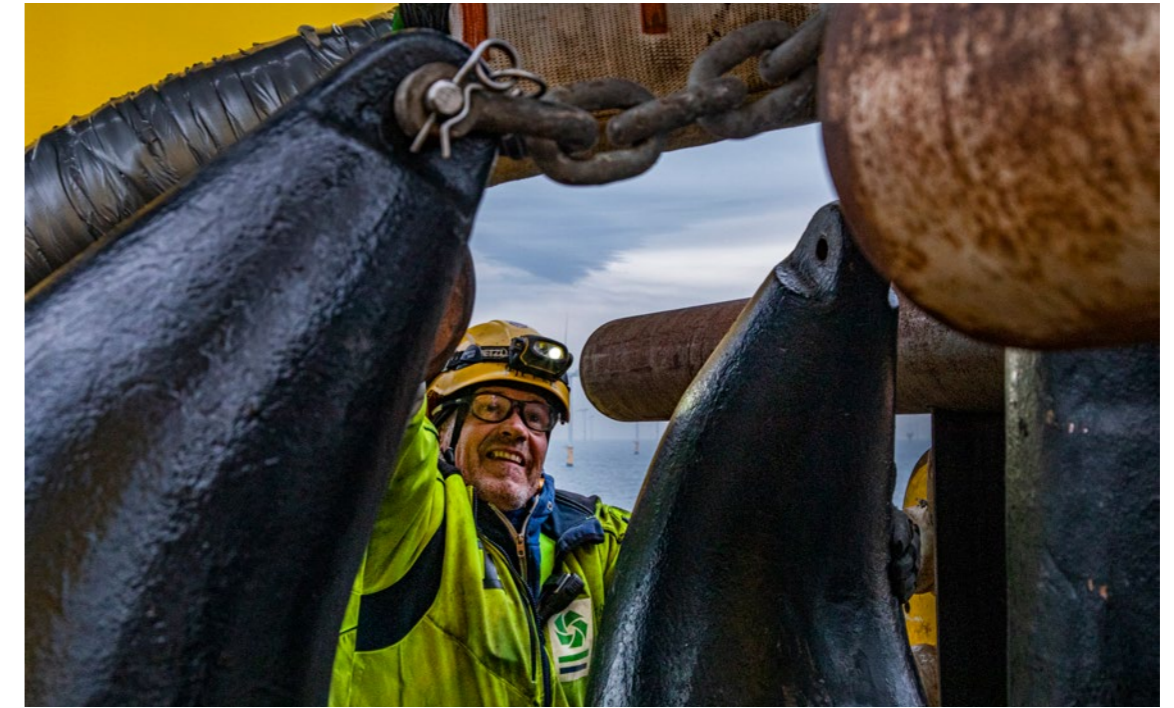
## The Energy@DEME spirit goes global

After celebrating its 15<sup>th</sup> anniversary, the Energy@DEME programme continues to attract more and more employees to participate in challenging sports events across the globe. They enjoy competing, but more importantly they enjoy coming together, meeting new colleagues and just having fun.

As well as individual sporting activities, many of our people are also inspired to adopt complete changes in lifestyle to improve their overall well-being. This year 12 colleagues took part in our DEME Heroes programme, where they decided to

switch to a sportier lifestyle. With personal guidance and coaching our Heroes got ready to cycle the legendary Mont Ventoux in France or run the Brussels half marathon, while being cheered by the crowds lining the streets. Separately, more than 100 DEME colleagues actually took on the challenge of climbing the Mont Ventoux.

This year the sporting calendar was packed full of every sport, from marathons in several countries to rowing dragon boats in Belgium, football in Asia to weekly yoga workouts. 2019 saw our people get active from Singapore to Russia, from the Netherlands to India, highlighting how the Energy@DEME spirit has certainly gone global!



## DEME's Core Values

We have established a set of standards applicable to our business units and subsidiaries worldwide. They are the centre of our commitment to consistently deliver excellence to our customers and value to our company. We also expect suppliers, subcontractors and partners to adhere to these standards.

**Safety** — The personal safety and health of employees and stakeholders is our greatest responsibility. Everyone has the right to work in a safe and risk-free environment at all times.

**Technical leadership** — With an open mind and the right team spirit, we continue to improve all aspects of our work process and develop trailblazing solutions to the needs and challenges of our customers.

**Respect & integrity** — Our employees are trained and motivated to meet the challenges ahead. Individuality and diversity are valued and performance is recognised. Our relationships with suppliers, subcontractors and partners reflect respect, understanding and sound business practice. We observe all applicable laws and regulations of the countries in which we are active. We respect human rights and prohibit discrimination.

**Innovation** — Innovation is the cornerstone of our achievements. We continuously push our boundaries by developing new, value-adding services and solutions.

**Value creation** — We make result- and sustainability-driven decisions in order to ensure long-term growth for the benefit of employees, customers and shareholders, including financial discipline to keep our company healthy.

**Environment** — We protect the environment and avoid any negative impact on the communities in which we do business. ♻️



# QUALITY, HEALTH, SAFETY & ENVIRONMENT



The 'safety by design' booklet outlines a set of guidelines for designing ships

## DEME launched four major QHSE campaigns during the year.

In early 2019, a recap of all the campaigns of 2018 was organised to ensure that everyone had been informed about topics such as DEME's manual of standard lifts, fire safety and prevention, and high potential incidents. With crew changes and working shifts, it is not always possible to get the message across in the first instance, so the safety recap was an important start to the year.

## Getting to your workplace safely

Then in the second quarter, we inaugurated the 'getting to your workplace' campaign as part of our annual safety campaign. It is based on the analysis of any incidents, near misses and dangerous situations reported within DEME. Five different videos and related communications material focused on a variety of working environments. These ranged from how people should transfer from the quayside to floating equipment, to using vertical ladders and e-biking.

Additionally, we launched the so-called 'Lucky Bag' concept. We want everyone in the company to be able to start a meeting with a 'safety moment', so thinking about safety issues becomes a habit. Attendees should all think of a safety topic in advance and then a name is picked out of the Lucky Bag at the start of the meeting.

## Raising environmental awareness

In July, an environmental information campaign began, aimed at encouraging people to recognise environmental issues related to the operational activities of the Group. The goal is to promote any local green initiative and to share them with other projects, vessels, sites or offices. This year we focused on energy consumption, air/soil emissions and waste.

We also established a centralised database of small workboats which will eventually involve around 300 vessels, which can be our own vessels or those we charter in. This methodology identifies which ones are fit to operate in protected/restricted areas, for example.

## Stop work authority

Our final campaign of the year, launched in November 2019, was the DEME Safety Moment Campaign, which centred on everyone having 'stop work authority'. In a video, our CEO Luc Vandembulcke stresses the importance of having the 'licence to stop'. Even better, prepare the work you have to execute. Put simply: before you do it, take the time to think it through. In December we organised a worldwide Safety Moment Day.

As well as the campaigns, we also produced a 'safety by design' pocket guide. Here we outlined a set of guidelines for the detailed design of a ship. We use this guide firstly to include the feedback from the crew and users of the vessels and secondly as a guideline when our designers and technical department have to make adaptations to existing ships or for newbuilds. ♻️



Hundreds of employees worldwide rolled up their sleeves in several beach cleaning initiatives

# INNOVATION MAKING IDEAS HAPPEN

**Innovation at DEME is not only about having ideas, it's about making ideas happen.**

DEME is focused on stimulating and managing innovation to tackle some of the world's major challenges. Resource scarcity (our deep-sea mining company GSR), feeding the world (aquaculture), CO<sub>2</sub> reduction (our dual fuel fleet able to run on LNG), plastic soup (our pioneering plastic collector vessel) and increasing renewable energy (wind and tidal energy projects) are just a few of the concrete examples of how we use innovation to find practical solutions.

At DEME we recognise that it is not just about having ideas, we need to make them happen. This not only helps us to tackle these important issues, we can also unlock potential new value for our company.

We identify challenges that need solving and then look to our people via several programmes designed to seek out and support innovative initiatives. One example is the DEMEx campaign, which focuses on disruptive, transformational innovation. Additionally, every two to three years we organise the Innovation Diver, which is aimed at employees worldwide. The last Innovation Diver resulted in an impressive 421 ideas, several of which were subsequently turned into reality.

## DEMEx

Our DEMEx campaign has led to 10 inspiring initiatives to take forward. These include an idea to 'Close the plastic circle' by recycling ocean plastic, and another one is 'Digi King', which helps us continue our digital transformation by digitalising the more labour-intensive processes within the company through the automation of administration and repetitive tasks.

'AI Sea' is another highlight. This initiative uses AI object recognition to support maintenance activities at wind farms by deploying drone technology for inspections offshore. Rather than sending maintenance technicians to board the turbines, we are developing the potential of unmanned services. We are already using drones in our survey department but we are now developing drones to cope with offshore conditions.

## Plastic soup solutions

To tackle plastic soup in our oceans, our employees suggested that we go to the source of the problem – the rivers. This golden nugget of an idea ultimately led DEME to launch a truly pioneering plastic collection initiative on the Scheldt River in Belgium, where we combine AI, an unmanned, fully electric, autonomous vessel and virtual reality.



**DEME is focused on stimulating and managing innovation to tackle some of the world's major challenges**

## 'Loads of ideas' board game

In a separate initiative, targeted at the productivity of our vessels and where we therefore need to involve our crew, we have developed the Co-creating our future 'Loads of ideas' board game. We understand that it is sometimes difficult to access the internet onboard, so we have reverted to a traditional board game. The aim of this game is to collect as many good ideas for productivity improvements as possible for each individual vessel. Good ideas might focus on increasing speed, volume and first-time-rights.



With the 'Loads of ideas' board game we collect ideas for productivity improvements on board of our vessels



In the Coastbusters project, nature-based techniques are tested to reduce coastal erosion

## Technology AntennaA

2019 also saw the launch of our 'Technology AntennaA' structure, a lean and simple way to stay in touch with new/emerging technologies. Our DEME 'technology scouts' each track their emerging technology by reading up on news flashes or university reports or by contacting interesting companies, start-ups, etc. Thanks to Technology AntennaA, all technology scouts and technology information can be gathered and shared company-wide in an efficient and structured way.

## Nature-based solutions

Alongside our key partners, we are using some innovative, nature-based solutions to tackle some of the world's environmental and economic challenges.

Edulis, a pioneering trial project exploring whether mussels can be cultivated at wind farms off the coast of Belgium, was

completed in 2019, and was heralded as a great success with the number and quality of the mussels exceeding expectations.

In another initiative using nature-based techniques, we are working together with other private companies and ILVO on the Coastbusters pilot project to test whether biogenic reefs (shellfish/marine flora/sand mason worm reefs) have the capacity to reduce erosion and even storm waves, and can keep up with sea level rises by natural accretion. The reefs have been installed near the Belgian coastal town of De Panne.

This project recognises the increasing need for coastal flood defences as sea levels rise. We want to explore sustainable systems that strengthen the ecosystem and are in harmony with natural processes. Ecosystem-based flood defences have several benefits (compared with conventional engineering approaches) including the improvement of water quality, carbon sequestration, the production of fisheries, stimulation of biodiversity,

nature conservation and the creation of recreational space. Examples of such ecosystems are tidal marshes, mangroves, dunes, coral reefs and also, as in the case of Coastbusters, shellfish reefs, flora reefs and sand mason worm reefs.

Coastbusters is a three-year project, concluding in 2020. 🌱

# FLEET INVESTMENT

## A FLURRY OF PIONEERING NEW VESSELS SET TO ARRIVE IN 2020

We continue to strive for improvements in our productivity rates and environmental performance, and this is highlighted in our ongoing, multi-year fleet investment programme. We are not content with merely fulfilling emissions regulations, we want to exceed them. Therefore most of our new vessels are equipped with dual fuel engines, which are capable of running on liquefied natural gas (LNG) and many of them are also already prepared for the new, carbon-neutral fuels of the future.

2019 saw the introduction of a new generation of trailing suction hopper dredgers (TSHDs) with the 15,000 m<sup>3</sup> 'Bonny River', which has been making her mark on projects throughout Europe. This unique vessel is able to dredge very hard soils and can work in deep waters down to an impressive 103 m.

We are geared up for a flurry of new arrivals in the next few months – many of which are absolute game changers in the industry. Our giant new, next-generation offshore installation vessel 'Orion' will be delivered in summer 2020 and will head straight to her first project at the Moray East wind farm. 'Spartacus' - the most powerful cutter suction dredger (CSD) in the world and 50% more powerful than any other CSDs currently operational in the market - will be reinforcing our dredging fleet. 'Spartacus' represents the next step in terms of production rates, pumping power and water depth and this is combined with her seagoing capacity and unmatched workability.

The 8,400 m<sup>3</sup> TSHD 'Meuse River', a new sistership to our pioneering dual fuel TSHD 'Scheldt River', is due for arrival in spring 2020, after which we will also be bolstering our smaller-sized hopper fleet with the addition of the TSHD 'River Thames'.

Looking further into the future, DEME is making a decisive move and investing in its first Service Operation Vessel (SOV) for the offshore wind industry. In an effort to offer our customers the entire package - from installing the foundations through to maintenance - the SOV is tailor-made for up to 24 offshore wind maintenance technicians. The new Small Waterplane Area Twin Hull (SWATH) and motion-compensated gangway will set new standards in safety, comfort and workability for a vessel of this size and is due to join our fleet in 2021.



## GAME-CHANGING OFFSHORE INSTALLATION VESSEL 'ORION'

Our giant next-generation offshore installation vessel 'Orion' will be delivered in the second quarter of 2020 and following sea trials in the Baltic, she will head straight to her first project at the Moray East wind farm.

'Orion' will feature a unique combination of exceptionally high transport and load capacity, impressive lifting heights and green technology. This powerful new vessel has a total installed capacity of 44,180 kW, and will be equipped with a huge Liebherr crane with a lifting capacity of 5,000 tonnes, which can hoist heavy loads over an exceptional radius. The loads can be lifted to an unrivalled height of more than 170 m.

'Orion' truly marks a milestone in the industry and will be one of the largest vessels in the world working in this sector. She will mainly be deployed to construct the largest offshore wind farms, to service the oil & gas industry and for decommissioning offshore installations. In a single shipment she can transport and install the next generation of multi-megawatt wind turbines. At 216.5 metres long, 'Orion' has a deck space and deadweight that has been maximised so she can handle the heaviest monopiles, jackets and wind turbine components. 'Orion' will be equipped with our in-house designed motion-compensated pile gripper which will set new standards in today's monopile installation industry.

We believe this exceptional vessel will enable the industry to take a significant step forward in reducing the costs of installing offshore wind foundations, as she combines strength with high levels of precision, being able to install monopiles at sea while in DP3 mode.

Sustainability was a very important consideration for the vessel design. 'Orion' has dual fuel engines enabling her to run on LNG, a Green Passport and Clean Design notation. Another environmental innovation is a waste heat recovery system that converts heat from the exhaust gases and cooling water to electrical energy. 'Orion' will be the first vessel in our fleet to have this new system on board.







Orion simulator

## ORION'S DIGITAL TWIN SISTER – A DEDICATED SIMULATOR

To successfully deploy 'Orion' on its projects and immediately meet DEME's highest operational excellence, safety and sustainability standards, we have built a digital twin sister of 'Orion'. This will enable us to train our operators and prototype, validate and optimise new working methods, as well as performing a lot of practical exercises.

### Simulator operations are prepared and conducted as if offshore

The high-tech simulator has all of the vessel's systems and crane and deck systems behaving as they would offshore. By recreating these three main operating areas - vessel, deck and crane - it's possible

to execution, with bridge, deck and crane operators to ensure tight cooperation, clear communication and agreement on procedures.

Communication and coordination are key, and these protocols are also tested and optimised in the simulator. During simulations, not only are standard operations performed but challenging and emergency scenarios are also tested so that our dedicated crew knows exactly what to do when offshore.

In addition, all the methods, operations, tools and equipment can be tested and prototyped. This means that the design and engineering teams gain valuable experience before the actual project begins, which gives DEME a major safety and efficiency advantage.



### Methods, operations, tools and equipment can be tested.

to perform installations on board the digital twin in exactly the same way as in the real offshore environment. Just as in real life operations, a toolbox meeting is held prior

## WORLD'S LARGEST CUTTER SUCTION DREDGER 'SPARTACUS'

Put simply, our new mega CSD 'Spartacus' is the most powerful ever built – being 50% more powerful than any other CSD currently in the market – and it is also the first that is capable of running on LNG. This powerhouse, built at the Royal IHC shipyard in the Netherlands, has a total installed capacity of 44,180 kW.

This vessel marks an important milestone in the industry, as we are certain that 'Spartacus' represents the next step in terms of production rates, pumping power and water depth, in combination with her seagoing capacity. Workability in sea states will be unrivalled, as is her ability to cut hard material, which would normally have to be done by expensive drilling and blasting techniques. Ultimately, projects that were previously economically unviable will now be possible with this game-changing vessel. We believe – just like our pioneering 'Pearl River' – which changed the game when she was introduced, that 'Spartacus' will open up new markets and even create its own.



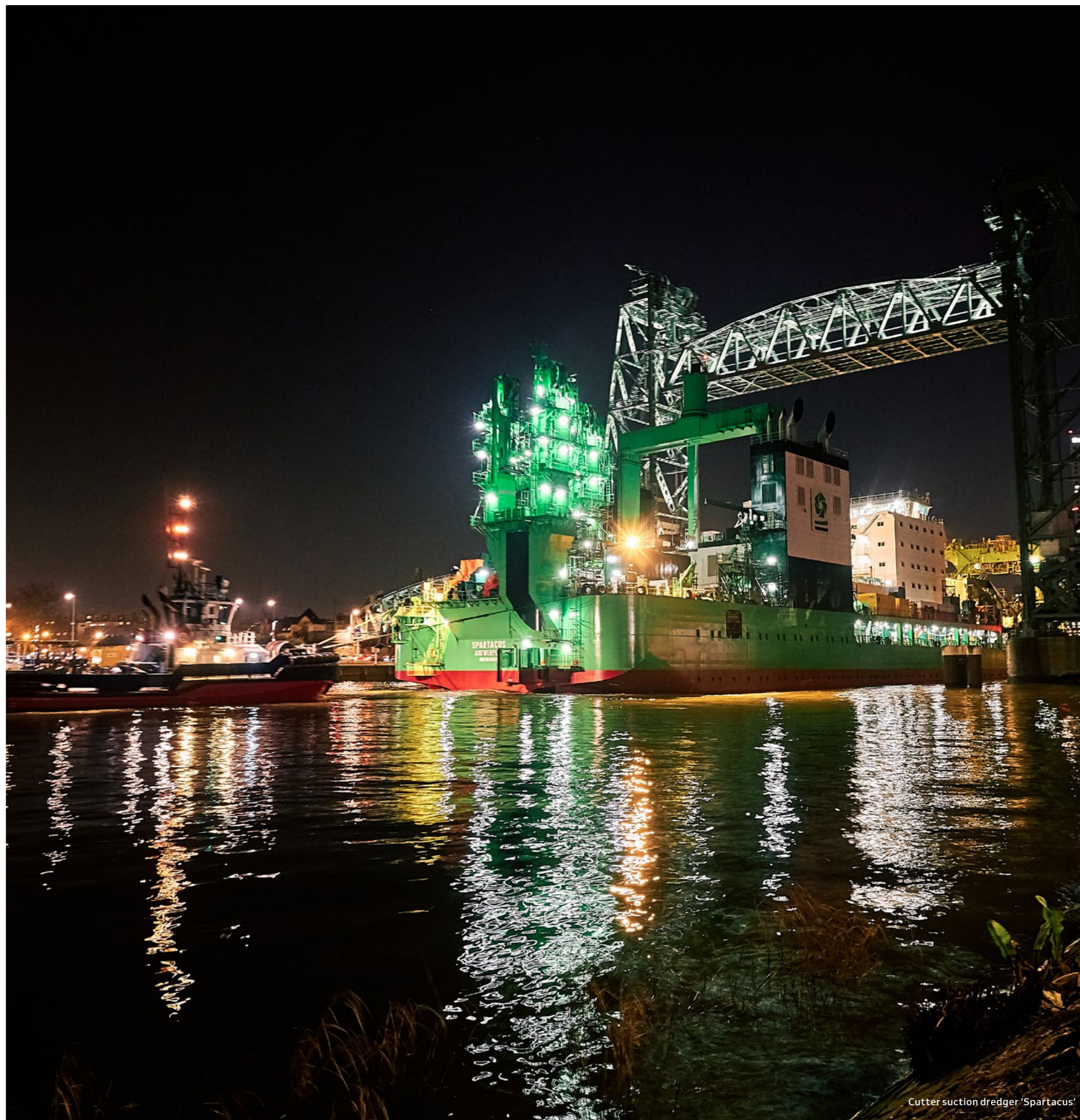
**Projects that were previously economically unviable will now be possible.**

Equipped with a power peak shaving and energy-saving flywheel system, 'Spartacus' can cut through hard rock more easily and at production rates that had not been possible before. Furthermore, 'Spartacus' can dredge down to an exceptional -45 m, rather than the usual -35 m, and she will have unprecedented autonomy and pumping distance.

Her autonomy is also a huge benefit. Often CSDs are going to remote areas, and can even be the first to arrive on site, so finding accommodation for the project team can be very difficult and expensive. But with 'Spartacus' we can comfortably accommodate everyone. The accommodation block is also resting on pneumatic dampers to minimise vibrations.

In addition, we can repair the cutterheads on board, which would normally have to be done onshore, so logistics considerations are much easier. In addition, the fuel tanks are larger and pumping capacity is 50% more than other CSDs, enabling the vessel to pump 15-20 km ashore without a booster.

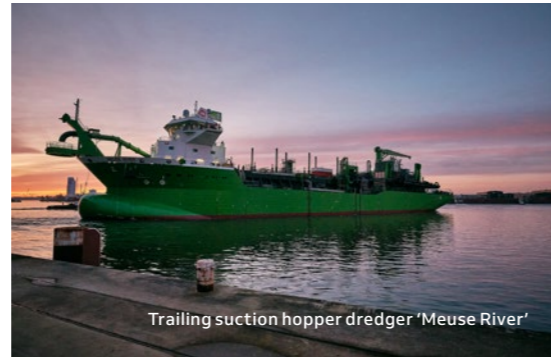
Although the vessel is able to operate fully on LNG, we recognise that the dredging process fluctuates and is often performed in remote locations. Therefore, 'Spartacus' can be powered by any type of fuel. Additionally, she has a waste heat recovery system that converts heat from the exhaust gases into electrical power, which can generate fuel savings of up to 10%. The evaporation of LNG will also cool the accommodation with a cold recovery system.



Cutter suction dredger 'Spartacus'



Trailing suction hopper dredger 'Bonny River'



Trailing suction hopper dredger 'Meuse River'

### Trailing suction hopper dredger 'Bonny River'

Since delivery in April 2019, our next generation TSHD, the 15,000 m<sup>3</sup> 'Bonny River', has been busy working on projects throughout Europe. She combines a large transport capacity with high productivity and a limited 8.5 m design draught. This unique vessel is able to dredge very hard soils and can work in deep waters to an impressive 103 m. The deep dredging equipment is permanently onboard, making it much more convenient. The versatile new dredger combines a very long suction pipe, a large transport capacity with a limited draught as well as, a heavy-duty trail pipe with a rock draghead.

The heavy duty trailing pipe and draghead can rip the seabed and are designed to cope with at least 50% more pulling force than a similar sized vessel, enabling her to trail harder soils with a TSHD than ever before. Additionally, being a fully-dynamic positioned DP2, she is ideal for performing activities such as trenching, which can be done close to shore or far out at sea. DP2 allows the vessel to manoeuvre with absolute precision.

In an industry first, 'Bonny River' has a large jet pipe on her suction tube using extracted overflow water from the hopper that is pumped back to the seabed and integrated in the dredging process. This enables the vessel to achieve 'closed circuit dredging' and realise higher trailing productions. Turbidity generated by the process water is therefore eliminated, which is particularly important in environmentally sensitive areas. 'Bonny River' is the first vessel with this ability in the market.

Moreover, the shape of the hull and two-speed propulsion gearbox and combinator mode propeller operation reduce fuel consumption considerably.

### Trailing suction hopper dredger 'Meuse River'

The 8,400 m<sup>3</sup> TSHD 'Meuse River', a sistership to our pioneering dual fuel TSHD 'Scheldt River' is set to be delivered in spring 2020. The new vessel has the same innovative design and is fully prepared to operate on cleaner fuels. Since it became part of the fleet, 'Scheldt River' has operated non-stop in Europe. In line with this success, we are keen to provide customers with a versatile and highly efficient vessel identical to the 'Scheldt River' for a broad range of dredging activities.

TSHD 'Scheldt River' has already proven herself to be a top performer in terms of pumping distance ashore. The hybrid gearbox on the pump enables full power when it is required, equal to a dual pump system. The two-speed propulsion gearbox and special thrust control results in at least 10% fuel savings during dredging operations.

This vessel combines a very shallow draught, with ample hopper volume and payload, as well as trailing power. 'Meuse River' has a Green Passport and Clean Design notation. 'Meuse River' also has a Dynamic Position & Dynamic Tracking (DP/DT) system, further enhancing manoeuvrability and position keeping.

### Trailing suction hopper dredger 'River Thames'

As well as larger TSHDs, we are also reinforcing our smaller hopper fleet with the 2,500 m<sup>3</sup> 'River Thames'. Being built by Royal IHC, TSHD 'River Thames' is due for delivery in April 2020.

With a deadweight of circa 2,800 tonnes and a shallow draught of only 4.25 m, the compact design ensures high manoeuvrability and optimised dredging works in shallow waters. This shallow water dredger has a very robust design and is easy to operate and maintain.

### Split barges 'Bengel' and 'Deugniet'

Two split barges, with a large hopper volume of 3,500 m<sup>3</sup>, will be delivered in 2020. The barges are much bigger than those in the existing fleet and are ideal to be deployed alongside the mighty CSD 'Spartacus' and our other large cutters.



## FIRST SERVICE OPERATION VESSEL (SOV) TO JOIN THE FLEET

To be able to offer the total package of services - from installing the foundations to maintenance - to the offshore wind industry, DEME is taking the bold step of investing in its first Service Operation Vessel (SOV) for maintenance technicians.

Currently under construction, the new Small Waterplane Area Twin Hull (SWATH) and motion-compensated gangway will set new standards for a vessel of this size in safety (and in particular the safe transfer of personnel on wind turbines at sea), comfort and workability. The keel laying ceremony took place in December 2019.

As offshore wind farms are installed ever further from the shore, technicians can spend many hours travelling to and from the wind farm, and when they arrive it can be difficult to scale the turbine if the conditions are not optimal.

Our new vessel, which is expected to be delivered in 2021, will be able to continue to operate in higher sea states and she enables a safe crew transfer in 2.5 m significant wave heights via the motion-compensated gangway. The twin-hulled vessel is much less prone to movement when approaching the turbines. With the provided DP2 technology the vessel can hold its position in rough sea conditions but still operate with lower fuel consumption compared to traditional SOVs. A reduction of fuel consumption up to 50% can be achieved compared to a monohull SOV.

We believe the twin-hulled design, a motion-compensated gangway and dynamic positioning is a winning combination and further reduces costs of wind farm maintenance, especially when compared to traditional crew transfer vessels.

Ultimately, the new vessel will play a role in improving the operability of wind farms because the SOV can comfortably

sail in rougher conditions and it can also stay in the field for two weeks at a time



**Our new vessel will be able to continue to operate in higher sea states.**

before having to return for the crew change and bunkering. Additionally, it has storage space onboard for spare parts for the wind turbines. The gangway can also serve as a crane to lift supplies from shore to the ship.

Our pioneering new vessel, which will accommodate 24 technicians and 16 crew, is already destined for her first wind farm projects Rentel and SeaMade, off the Belgian coast. 🌊

# STRUCTURED FINANCE



**Our Structured Finance team assembles tailor-made financing packages and negotiates these packages with potential investors, financial institutions and authorities.**

The aim is to offer financing possibilities to customers, in developed or emerging markets, that may not be able to arrange competitive financing solutions locally, especially with regard to credit costs, tenors or amounts.

## **Competitive and transparent solutions**

By working with our Structured Finance team, customers know that they have a competitive, safe and transparent payment solution. Export finance projects are popular in Africa, but they also attract interest in several other regions around the world, such as South East Asia, the Middle East and Latin America.

Every financing arrangement is specifically tailored to the requirements of each customer and their individual projects. We can arrange straightforward buyer's credits, soft loans (if the client is eligible for concessional lending), structures allowing customers to defer payments, or a combination of these options.

In early 2019, for example, our Structured Finance Department assisted the government of Benin with a financing package for additional coastal protection works in Cotonou.

## **Fully compliant**

The financing packages are fully compliant with the Organisation for Economic Co-operation and Development's recommendations and guidelines, as well as those of the banking institutions. Consequently, the inherent economic, environmental and social sustainability aspects of each project are duly analysed.

## **Network of international financial institutions**

We work with a broad range of financial institutions and have a long-standing relationship with Credendo, the Belgian Export Credit Agency (ECA), and Finexpo, the Inter-Ministerial Committee for Financial Support of Belgian Exports. We also work with a pool of international financial institutions to achieve the best solution for our customers. Low interest rates and attractive financing conditions in Europe often mean that we, as a contractor, have a very competitive offer for our many international clients.

## **More structured finance**

In addition to arranging financing for our projects, the Structured Finance team supports us when we work on international projects which involve public private partnerships, or when we invest in new vessels or innovative new equipment. The team maintains contacts with Development Finance Institutions and multilateral entities, as well as assisting us with mergers & acquisitions and business development opportunities such as the pioneering remediation project Blue Gate Antwerp.

Our Structured Finance team also works closely with DEME Concessions on several projects across the globe. These might be river concessions, port or infrastructure projects. They also perform financial modelling related to our business plans and investment opportunities and hold discussions with banks and partners. 🌐



# OPPORTUNITY & RISK MANAGEMENT

Opportunity & Risk Management (ORM) is at the heart of DEME, not only for our own benefit but also so we can better assist our customers. After several years focusing on embedding the ORM procedures and mindset throughout our company, it has become second nature to think about ORM considerations in all our tenders and projects.

In 2019, we restated our mission to reinforce the importance of ORM. This campaign addressed three major points - detecting, acting and learning. We stressed the importance of focusing on identifying all risks and opportunities, acting on them to ensure they are mitigated or captured and learning from them. It is vital that all the relevant lessons learned are taken onboard in the next project and that these lessons are shared transparently to promote ORM harmonisation throughout the company.

Additionally, we recognise that, in order to learn, people need access to the right information. This has led us to share our comprehensive ORM database with a transparent and visual dashboard application, where employees can access current and past projects and tenders. Analysing the vast amount of data generated by tenders and projects allows us to provide more insights to our internal users.

## Highlighting the benefits for our customers

Crucially, our customers benefit from our robust approach to ORM. In this industry it is not unusual to push boundaries and to innovate - it is our and our customers' business. And this often involves some level of risk. Yet with our learning approach we are geared up to provide a good insight into the risks, but also the opportunities in every project, and this is all done transparently.

We at DEME are very good at finding innovative and creative solutions for our customers. ORM is just one important tool which helps us support our customers all over the world. 🌍



**It has become second nature to embed ORM in all our tenders and projects.**

# DRIVE

## DRIVE Operational and Technical

In 2019 we made strong progress in transforming DEME into a digital pioneer, fit for the future. The DRIVE team has focused on leveraging Big Data and Internet of Things capabilities, to facilitate and stimulate continuous improvement throughout the company. It is safe to say that the DRIVE team are redefining the entire production reporting 'ecosystem'.

This is really highlighted in the DEME Reporting Engine (DRE) and the Onboard Production Reporting and Analysis (OPRA) app. DRE is DEME's new production reporting system in the Cloud and OPRA is the app that employs IOT to automate production and quality reporting on board our vessels. The information generated by OPRA is directly stored in DRE.

"BOOS-T acts as a catalyst for project preparation. Operational and technical benefits include better prepared vessels, specifically trained crew and accurate wear and tear predictions."



— Wim Du Meunier, Master TSHD 'Brabo'

## DEME Reporting Engine

DRE has now been implemented for our dredging and offshore activities. Already a significant proportion of our reporting on activities with hopper dredgers, offshore installation works and steel fabrication is stored in DRE. By the end of 2020 all of DEME's dredging and offshore activities will be captured in DRE.

One of the advantages of DRE is that it enables the deployment of more robust analysis tools like Power BI to replace the legacy Excel-based tools. The DRIVE dashboards are prime examples: new Power BI-based dashboards that use data directly from DRE have been implemented and replace the Excel dashboards. This enables 'one version of the truth' when it comes to production analysis.

## Onboard Production Reporting and Analysis

Taking advantage of the possibilities of the Internet of Things, an app has been developed called OPRA. Using the data captured by the vessel's sensors, OPRA automatically records what the vessel is doing. This information is then stored in a local DRE system onboard our vessels and the data is subsequently synchronised with DRE in the Cloud. The main advantage is a significant increase in quality and scope of the production and quality data.

In 2019, OPRA has been developed on the hopper and cutter simulators and successfully piloted on two vessels. The full OPRA roll-out on our dredging fleet will take place in 2020.

## BOOS-T Crew involvement programme gets a further boost

The BOOS-T programme, which focuses prominently on the role of the crew in the continuous improvement process, was initiated in 2018. This year the team was joined by four production improvement experts, which kickstarted the implementation of BOOS-T.

BOOS-T is facilitating much earlier involvement in the project preparation phase of our projects and enables us to capture improvement opportunities at a much earlier stage. These may involve the technical tuning of vessels to be fully optimised and equipped for specific project requirements or the skills development of the crew by advanced simulator training. Essentially, BOOS-T enables us to be properly prepared in terms of equipment and crew skills.

Additionally, during project execution, BOOS-T will provide expert production improvement support to our crew. Finally, at the end of projects, it enables us to be much better at capturing the right lessons learned.

## Yellow and green jersey awards

Inspired by the Tour de France, each year the DRIVE yellow and green jerseys are awarded to areas or business units for exceptional DRIVE results. In 2019 the yellow jersey went to the Asia-Pacific area, while DEME Environmental Contractors (DEC) was awarded the green jersey.

## DRIVE is our continuous improvement programme, which is founded on three pillars:

**1 DRIVE Operational and Technical** provides a pragmatic approach to operational process improvements and bottom-up innovation.

**2 DRIVE Cost** focuses on sourcing improvement through the regular renegotiation of framework agreements for our main product families, as well as supplier consolidation across departments and business units.

**3 DRIVE Transactional** aims to realise savings, efficiency enhancements and cash out reductions through supporting process improvement.



## DRIVE Cost & Transactional

In 2019, DRIVE Cost & Transactional focused on new opportunities for cost savings and the continuous improvement within existing improvement projects, as well as on new ones.

For example, within existing projects, cost saving opportunities have been identified in the field of ICT, HR and Purchasing & Logistics. Multifunctional teams have been created in cooperation with other departments. One example was a large exercise with HR fleet management, which examined long-term car leases. Here the

focus was on framework contracts with dedicated lease companies and on the Total Cost of Ownership, rather than the cheapest monthly lease fee.

The Technical Department looked at new ways to reduce the maintenance costs of the vessels by shortening overhaul times and having longer intervals between the overhaul of components facilitated by better condition-based monitoring.

The DRIVE team also examined the charter costs of floating auxiliary equipment and how to do chartering in a smarter way. For example, is it possible to

interchange hired vessels to other projects if they were due to be temporarily idle. In addition, there was a focus on improved monitoring of floating, sinker and shore pipelines and lifecycle cost reduction. This can be achieved by a better tailoring of the pipeline spread which is sent to a project. For example, by matching the optimal diameter pipeline with an individual project. Towards the end of the year, the team was focusing on the determination and acquisition of the most suitable pipeline for the giant new CSD 'Spartacus', including a smart coupling tool for the floating pipeline.

# DEME4LIFE

One of our major long-term humanitarian projects is our partnership with Mercy Ships



DEME has been active in all corners of the globe in 2019 and this is reflected in the many charitable projects we participate in. We endeavour to give back to local communities and are involved in many projects worldwide, which are aligned with both our own core values and the Sustainable Development Goals of the United Nations. Many of these inspiring projects are also a direct result of our employees' initiatives.

For more than half a century, we have had a presence throughout the African continent and one of our major long-term humanitarian projects is our partnership with Mercy Ships. This unique floating hospital is the world's largest civilian hospital ship providing state-of-the-art care totally free of charge. Because over 50% of the population in Africa lives within 100 miles of the coast, Mercy Ships' modern hospital ship can call into a nearby port and people can receive first-rate medical care. The 400-strong crew of volunteers include captains, sailors, surgeons, nurses, kitchen staff and cleaners. Mercy Ships is always looking for skilled mariners and we promote this volunteering opportunity within our own organisation.

Currently, one ship is in operation but it is hoped that Mercy Ships will be able to deploy a second hospital ship soon. Under construction in China, 'Global Mercy' will be the largest private hospital ship with 199 hospital beds and six surgery rooms. DEME is particularly delighted to be able to contribute to the addition of a second vessel. With the support of DEME4Life, we are assisting with maritime training and medical programmes and our financial contribution also helps towards providing new X-ray equipment.

DEME4Life also partners with **Ondernemers voor Ondernemers** with a unique, sustainable dredging project on the Congo River, which ultimately helps Congolese youngsters enter a dedicated, four-year study programme at the Antwerp Maritime Academy.

On the Asian continent, we have been equally busy this year and have several multi-year charitable projects in place. We again partnered with **The Red Pencil**, which is an NGO that offers both creative and clinical arts therapy services to various organisations including hospitals, family centres, shelters and schools. In Indonesia, we also supported The Red Pencil's work with **YPKAI Rumah Singgah** (the Indonesian Child Cancer Care Foundation). Art therapy was organised to enhance psychological support of sick children staying at YPKAI. Additionally, The Red Pencil assisted local art therapists so that they could support children and their families impacted by the terrible earthquake in Lombok.

In India, DEME4Life maintained our partnership with **Sister Jeanne Devos** and the **JAAN Foundation**. This foundation promotes a safe childhood for child domestic workers and other vulnerable people by offering shelter, education and skills development. Our cooperation also continued with the **Namma Beach-Namma Chennai** beach cleaning project. This helps to raise local awareness about plastic pollution and mobilises the local community to participate in beach cleaning initiatives. The volunteer team also supports projects in local schools and several community initiatives in Chennai, as well as carrying out the beach clean-ups.

Closer to home, in Belgium many of our employees volunteer at the **Special Olympics**, where thousands of athletes with intellectual and physical disabilities compete in a wide range of sports disciplines. We also provide financial support for equipment and logistics. As well as this, we support **De Steenschuit**, a Belgian organisation helping unemployed young people to gain skills and experience that will enable them to enter employment or receive further education.



We support The Red Pencil, an NGO that offers both creative and clinical arts therapy services



## ETHICS & BUSINESS INTEGRITY

**Our commitment to responsible business practices is absolute. The DEME Code of Ethics and Business Integrity puts our core values into practice and provides guidance to all our employees worldwide in making sound ethical business decisions by inspiring dialogues about ethics and compliance issues.**

The principles of our Code of Ethics and Business Integrity are both simple and clear: comply at all times with the applicable laws and regulations, act with integrity and honesty, and avoid inappropriate behaviour or even the appearance thereof. It is the personal responsibility and obligation of every employee to adhere to these principles. Moreover, we expect every third party we do business with to respect and act according to our core values and ethical principles.

The DEME Code of Ethics and Business Integrity covers important areas, such as protecting people and company assets, anti-bribery and anti-corruption, compliance with international trade laws, accounting standards and records.

### Protecting people

We are committed to providing a workplace free of discrimination where all employees are treated fairly. We value the diverse backgrounds and talents of employees. As an international player, we ensure that everyone has equal access to opportunities, using the same criteria for employment and promotion for our worldwide activities.

We never compromise on health and safety. To maintain our carefully built-up and valuable reputation in this respect, compliance with our quality processes and safety requirements is key for every individual working for us, both directly and indirectly. Our Health and Safety Policy further guides employees in maintaining a safe and healthy workplace for themselves and others by complying with health and safety procedures and by reporting incidents, injuries and unsafe equipment, practices and conditions.

### Protecting company assets

Employees are required to take care of our assets responsibly and protect them from theft, loss and misuse. This includes both physical assets and intellectual property.

### Anti-bribery and anti-corruption

Our anti-bribery and anti-corruption policy ensures that business throughout the world is conducted in an ethical and legal manner. Rigorous procedures and controls have been put into place to detect and prevent any form of bribery or corruption. These procedures or controls are periodically reviewed to ensure compliance at all times.

### International trade laws

We are committed to complying with the applicable laws and regulations in the countries where we operate. Also, we ensure compliance with applicable national and international sanction regulations.

### Accounting standards and records

In order to guarantee the accuracy of our financial records, employees are responsible for providing complete, reliable and accurate data. We work according to accounting standards and procedures that are key in meeting our obligation to provide full and transparent disclosure to stakeholders and regulatory authorities. 🌱

The complete DEME Code of Ethics and Business Integrity can be found on our website.

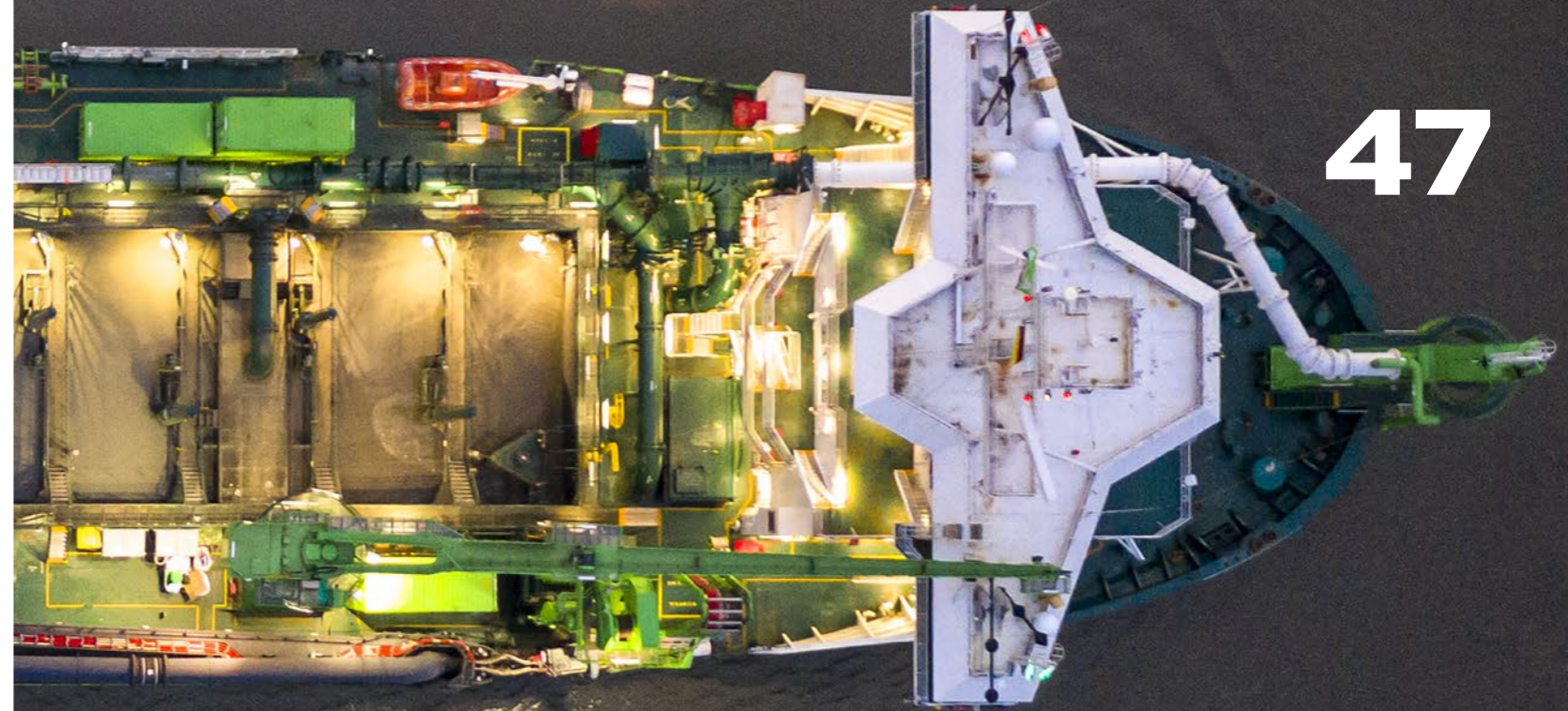


# 1

## DREDGING & LAND RECLAMATION

**Dredging and land reclamation are more than just our core activities. They are at the very foundation of our company.**

We are involved in dredging and land reclamation projects worldwide, offering customers innovative solutions for even the most complex projects and challenging environments. We operate the most technologically advanced fleet, including the world's first dual fuel dredging vessels. Over the past few decades, we have executed major marine engineering infrastructure works such as the development of new ports, waterways, airports, artificial islands, residential and recreational areas, industrial zones, roads and bridges, on all continents.



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# EUROPE



## BELGIUM

### Access to the ports of Antwerp, Zeebrugge and Ostend

In Belgium, our long-term maintenance dredging contracts on the major waterways and along the coast were extended for another two years. Our TSHD 'Pallier' was active throughout 2019 performing several maintenance dredging campaigns on the Scheldt River and in the access channels to the Port of Antwerp. Meanwhile, our TSHD 'Artevelde' was equally busy along the coastline and in the access channels to the ports of Zeebrugge and Ostend. Most of the dredged sediments from within the Port of Antwerp were treated at AMORAS, Europe's largest mechanical dewatering plant for dredged materials.

### Ghent-Terneuzen Canal

The maintenance dredging contract along the Ghent-Terneuzen Canal continued during 2019 and was again extended for a year. Dredging was performed with a pontoon and crane. The dredged material is being treated by DEME Environmental Contractors at its soil and sediment recycling centres in Belgium.

### Hedwige Prosperpolder

In a three-partner consortium, we were awarded a major five-year contract from De Vlaamse Waterweg (the Flemish waterways authority) for dry earthmoving works at the Hedwige Prosperpolder. Situated alongside the Scheldt River on the Belgian-Dutch border, with 295 ha in the Netherlands and 170 ha in Belgium, Hedwige Prosperpolder is being restored as a floodplain. The earthworks represent a volume of 3 million m<sup>3</sup>. Previously, we also performed work on the adjacent site, which was 170 ha and represented 1.6 million m<sup>3</sup>. When the main works on the two polders have been completed, the primary dyke will be relocated to enclose the sites.

**BELGIUM**  
Electrically-driven CSD 'Blanew' is deployed in the marinas of Ostend, Zeebrugge and Blankenberge



### Loswal 1B2

We were awarded a new contract to perform dry earthmoving works to remove a 12 ha dredging deposit, which has been used for many decades in the Port of Antwerp. Removing the deposit will enable the PSA container terminal to extend its facility. Work started in the summer and eventually some 1 million m<sup>3</sup> of material will be handled. The sediments will all be treated at the AMORAS facility within the port.

### Marinas in Ostend, Zeebrugge and Blankenberge

A maintenance dredging campaign in the marinas of Ostend, Zeebrugge and Blankenberge was completed in the summer but we were awarded a new contract for the next four years. This work is carried out by our electrically-driven CSD 'Blanew', which has been specifically designed for dredging works in marinas, canals and lakes. The vessel is self-maneuvring and has a special shaped cutter ladder which allows it to dredge between jetties and under pontoons without removing them. 'Blanew' is powered by means of an umbilical, floating electric cable, which is directly connected to the shore-based renewable electricity-network. As well as not producing emissions, 'Blanew' is virtually silent while operating.

Additionally, the entrance to the Port of Blankenberge is being dredged by our CSD 'Vlaanderen 16'. The sand is then being used to reinforce the beach or the foreshore.

**BELGIUM - ANTWERP**  
TSHD 'Pallietier' performed several dredging campaigns on the Scheldt River



### Port of Zeebrugge

A 'sweep' contract for the Port of Zeebrugge, to level out the high spots underwater with a deep-water plough, was again extended for a year. This is mainly performed near the quay walls to maintain the depth to accommodate the latest generation of larger vessels.

### Knokke

In 2019 we supplied the first batch of sand for a major beach reclamation project in Knokke, which we are performing within a consortium. This project will ultimately involve a volume of 1.5 million m<sup>3</sup>.

### Nieuwpoort Marina

As part of a consortium we have been awarded a contract by the Flemish government to perform dredging works for the construction of a new marina in Nieuwpoort. The new contract will run until the summer of 2022. We have now been working on this project continually since 2013.

This year we mainly focused on the various permitting procedures and the design of the new marina. Alongside the dredging activities, we are responsible for the dry earthmoving works, road and pavement construction.

Nieuwpoort Marina, with 2,000 berths, is already one of the largest in northern Europe, but there is a demand for moorings for boats longer than 15 m. Therefore an additional dock with an adapted draught was needed. The development will eventually lead to a new district with 1,000 accommodation units and 500 extra berths.

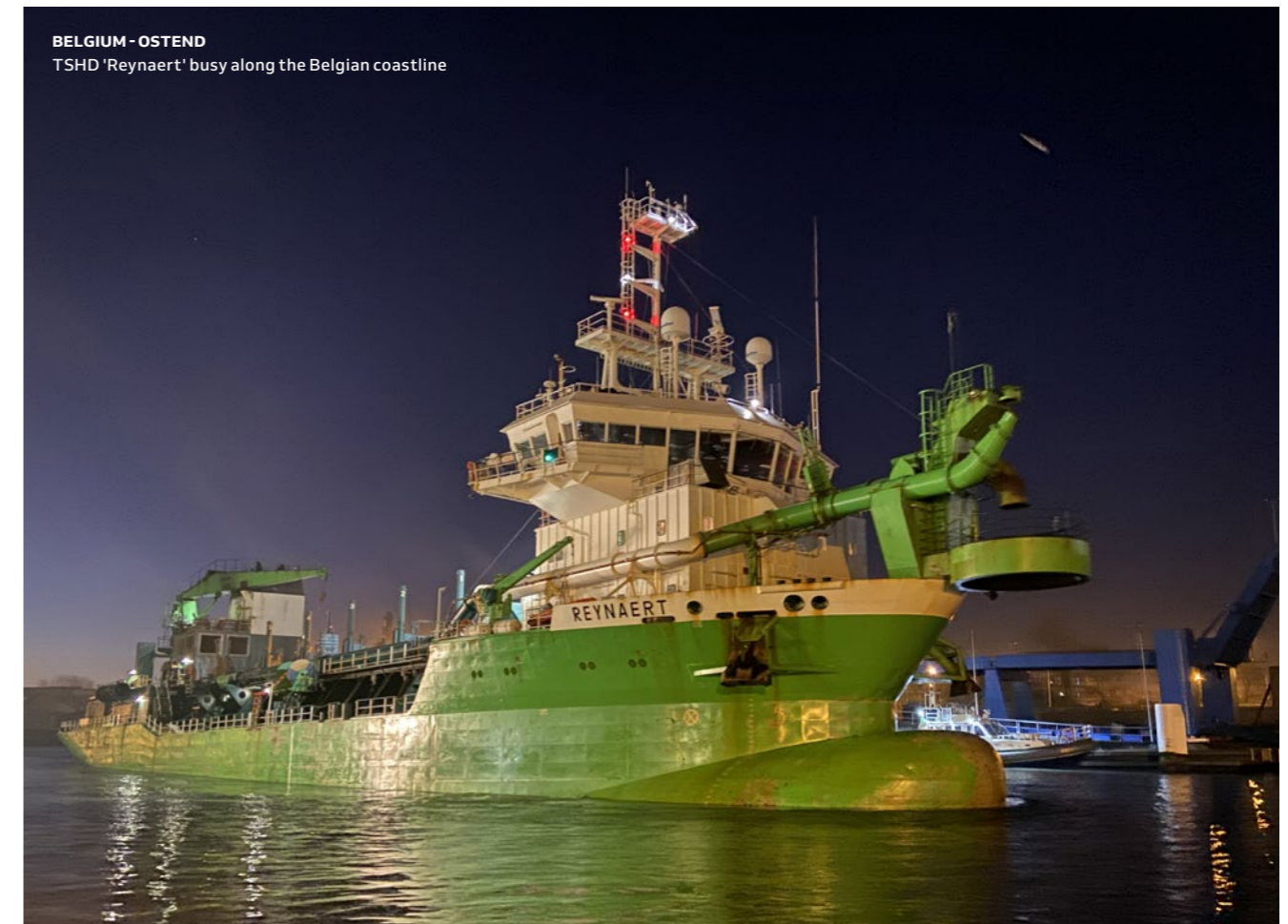
### SeaMade Offshore Wind Farm

We have been performing dredging works for the SeaMade Offshore Wind Farm in the Belgian North Sea, while DEME Offshore has been awarded the contract to install the foundations, turbines, substations, export cables and inter-array cables.

### Modular Offshore Grid (MOG)

We performed seabed preparation works for the submarine power cable installation for the Modular Offshore Grid in the North Sea on behalf of the Belgian transmission system operator Elia. Our pioneering, dual fuel hoppers 'Minerva' and 'Scheldt River' carried out the work. The cables have been installed by the innovative cable installation and multipurpose vessel 'Living Stone'. The MOG project was completed in July 2019.

**BELGIUM - OSTEND**  
TSHD 'Reynaert' busy along the Belgian coastline



## THE NETHERLANDS

Three prestigious megaprojects in The Netherlands - the RijnlandRoute, Blankenburg Connection and New Lock Terneuzen - highlight how our activity lines support, reinforce and generate works for one another. Besides the infra marine works, a major dredging and ground works component is involved. Several of our activity lines are working shoulder to shoulder on these megaprojects and they highlight the diverse capabilities and synergies within the group.

### RijnlandRoute

For the RijnlandRoute, which is a new road connection from Katwijk to Leiden in the Netherlands, the sand supply for this huge project was completed in 2019. Eventually this represented more than 2,000 ship movements and a total of 1.1 million m<sup>3</sup> was delivered.

We have also been busy this year with dry earthmoving activities and the removal of sludge as the boring for the 2.2 km bored tunnel got underway. The tunnelling work is being carried out at a rate of around 15 m per day. Sludge and mud from the tunnel, which represents approximately 500,000 m<sup>3</sup>, is now being pumped out and transported to three dumping pits situated next to the project, in an area known as the Meeslouwer plas.

### New Lock Terneuzen

The 427 metre-long New Lock Terneuzen is being constructed on the existing Terneuzen locks' complex and is designed to provide better access to the ports of Ghent (Belgium) and Terneuzen (the Netherlands). We are responsible for the dredging and dry earthmoving works for the New Lock, which are in full swing. We will dredge (capital and maintenance) and/or reclaim a staggering 13 million m<sup>3</sup> of material during the whole project. This year approximately 2 million m<sup>3</sup> of material was handled.

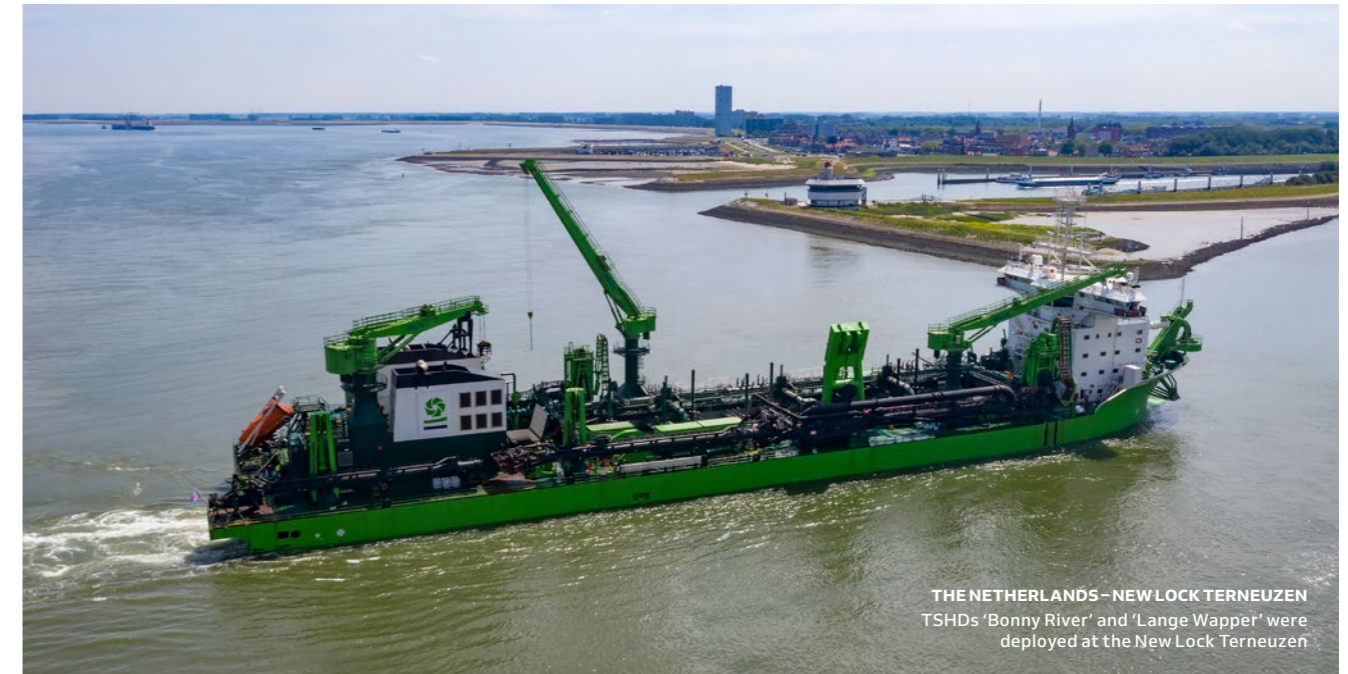
An important part of the project was to dredge a temporary bypass channel so ships could continue to pass in and out of the locks during the term of the project. Completed in the second quarter, this special channel, known as Kapitein Rooibos, is approximately 200 m long and 50 m wide.

We previously performed remediation and reclamation works under Phase 1 and 2 of the project at the Schependijk near the New Lock.

We are also responsible for the permitting procedures for the reclamation and remediation works, which are being performed in an innovative way using a dredger hopper and we also arranged the supply of the dredging equipment for the temporary bypass work.



THE NETHERLANDS - NEW LOCK TERNEUZEN  
We are carrying out dredging and reclamation works at the New Lock Terneuzen



THE NETHERLANDS - NEW LOCK TERNEUZEN  
TSHDs 'Bonny River' and 'Lange Wapper' were deployed at the New Lock Terneuzen



THE NETHERLANDS - NEW LOCK TERNEUZEN  
A project like the New Lock Terneuzen highlights how our activity lines support and reinforce one another

## Blankenburg Connection

Dry earthmoving works are progressing on schedule for the prestigious Blankenburg Connection project and this year, we finalised the basic design together with Ballast Nedam Infra and commenced construction of the 825 m immersed tunnel (the Maasdeltatunnel). The cofferdams of the Maasdeltatunnel in both the north and south have been completed and the combi-walls of the tunnel approaches and ramps are nearing completion. Dredging and back-filling volumes represent approximately 1 million m<sup>3</sup> and dry earthmoving works around 2 million m<sup>3</sup>. Dredging works will start in early 2021.

De Vries & van de Wiel completed the initial sand supply during 2019, which represented volumes of around 350,000 m<sup>3</sup> and the supply will continue in the years to come.

Rijkswaterstaat (part of the Dutch Ministry of Infrastructure and Water Management and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands) awarded the EUR 1 billion, public-private partnership project 'A24 Blankenburg Connection' to the BAAK Consortium, which comprises DEME Concessions, Ballast Nedam Concessions and Macquarie Capital.

The project was awarded on a design, build, finance and maintenance basis and will run for a period of 20 years.

The A24 Blankenburg Connection connects the A20 and the A15 and improves access to the Rotterdam region. The scope includes the construction of a highway with 2x3 lanes, a land tunnel, immersed tunnel, a deepened connection to the A20 road and a high connection to the A15. Additionally, the A20 will be widened. Works are expected to be completed between 2022 – 2024. This ambitious project originates from the Masterplan Rotterdam Vooruit (2009), a vision for the development of the Rotterdam region that covers the period 2020- 2040.

## Gorinchem-Waardenburg dyke reinforcement

Together with our partners, we won a prestigious contract to carry out a major dyke reinforcement project on the Waal River. The 'Dyke reinforcement Gorinchem-Waardenburg' (GoWa) project also introduced a new contract form, known as an alliance. It is believed to be the first time this contract form has been used in the Netherlands related to dyke reinforcement and where the partners of the alliance work together right from the beginning of the project. Our scope includes surveys, design, planning, process, permits and the realisation of the dyke reinforcement.

In the framework of the alliance, the partners start from scratch to create the design and then, once this is optimised, they can price it, reducing the total cost of ownership for Waterschap Rivierenland. The contract highlights how the partners really work together closely and trust each other to provide the best solution for our customer. The 23-km dyke reinforcement is part of the Netherlands Flood Protection Programme. Operations are due to start in March 2021.

## Rivers in the west of the Netherlands

Under a five-year contract we are conducting a maintenance dredging programme for rivers in the west of the Netherlands, near Dordrecht and Rotterdam. The hopper dredger 'Zeeland' is being deployed.

## IJburg - 'Strandeiland' (Beach island)

During 2019 the IJburg - 'Strandeiland' project was in full swing. Together with our joint venture partners, we are carrying out a 145 ha land reclamation project to create

a new island, which will be a new residential area in Amsterdam. By November 2019, we had delivered 5 million m<sup>3</sup> of sand for the project. In total, 12 million m<sup>3</sup> will ultimately be delivered when all of the phases have been carried out.

We are deploying six vessels on the project, including our specialist spray pontoon 'Omega'. Additionally in 2019, the joint venture completed a new beach to replace an existing one used by residents.

Work on phase 1 is expected to be finished in Q2 2020. The second phase of the project will involve the delivery of 3.5 million m<sup>3</sup> of sand and is expected to start directly after phase 1.

Crucially, we are investing heavily in adapting our vessels in the Netherlands by installing selective catalytic reduction equipment to enable us to conform to new Dutch regulations on nitrogen oxide emissions. Eventually nine vessels will be upgraded.

## The 'Sluishuis'

Again in IJburg, we completed our part of a project which will prepare the contours of an iconic new building in Amsterdam – the 'Sluishuis' (Lock House). Our scope included dredging and reclamation. The Lock House is scheduled for completion in 2020.



THE NETHERLANDS - AMSTERDAM  
We are carrying out a 145 ha land reclamation project to create a new residential area in Amsterdam

## GERMANY

We were particularly proud to be awarded the prestigious Elbe River deepening contract in April 2019, and operations officially kicked-off in the summer. We believe the contract award is largely due to the in-depth knowledge and strength of our tender team and because we have had a long-lasting presence in Germany dating back more than five decades.

During the tender procedure, we quickly understood that this contract is not just about a complex hydraulic engineering project, but primarily a complex environmental engineering concept where sustainable construction methods and planning for the sake of protecting the environment are the main and primary focus. Our tender teams really understood the purpose of the project and respected all the environmental constraints to develop the most efficient technical solution for the benefit of our customer.

GERMANY - ELBE  
Our dredging vessels will be regularly saluting ships of all sizes and colours while deepening and widening the Elbe



## Elbe River

### Deepening and widening

The dredging works of the Elbe started with an official launching ceremony on 23 July 2019 in Wedel, close to Hamburg. Operating on LNG, our trailing suction hopper dredger 'Scheldt River' and backhoe dredger 'Peter the Great', with our self-propelled split hoppers Vlaanderen VII and VIII, kicked off the works. They were followed in October 2019 by our TSHD 'Bonny River', and spreader pontoons 'Vagant' and 'Al Dana' for the dredging, transportation and relocation of around 32 million m<sup>3</sup> of material. The main goal of the adaptation of the 116 km long Elbe fairway is to enable container vessels to reach and leave the Port of Hamburg independently of the tides, with an extra draught of 1 m.

The dredging works for the fairway adaptation consist of four major tasks, including the river widening, the creation of a so-called passing box, the deepening of an existing anchorage, which will form a waiting area, and the deepening of the entire channel with a prime focus on limiting the potential ecological impact.

For the dredging works, the 116 km long Elbe fairway is divided into 18 work sections and simultaneous dredging is only allowed in three at the same time in order to minimise the impact on the maritime traffic.

Initially a 43 km long stretch has to be widened by 20 m. The second step comprises dredging the passing box in an area near to Wedel. Here the Elbe River is widened 385 m, creating a 'dual carriageway' allowing two container vessels to safely pass each other.

For the dredging works for the widening and the passing box, in total approximately 700,000 m<sup>3</sup> needs to be dredged and disposed of in the newly-built underwater disposal areas. DEME's BHD 'Peter the Great' is being deployed for the harder soils like clay, while softer soil such as sand and silt will be tackled by the TSHD 'Scheldt River'.

Dredging with overflow is not allowed between April until October in some sections for environmental reasons. Additionally, a waiting area near Brunsbüttel needs to be created which counts for another 2.5 million m<sup>3</sup> of soil to be dredged. This will serve as a vessel anchorage area.

Once these steps are complete, the deepening of the fairway from the Wedel area all the way to the North Sea begins. Our TSHDs 'Scheldt River' and 'Bonny River' will eventually dredge some 29 million m<sup>3</sup> and this will be relocated in five different underwater disposal areas.

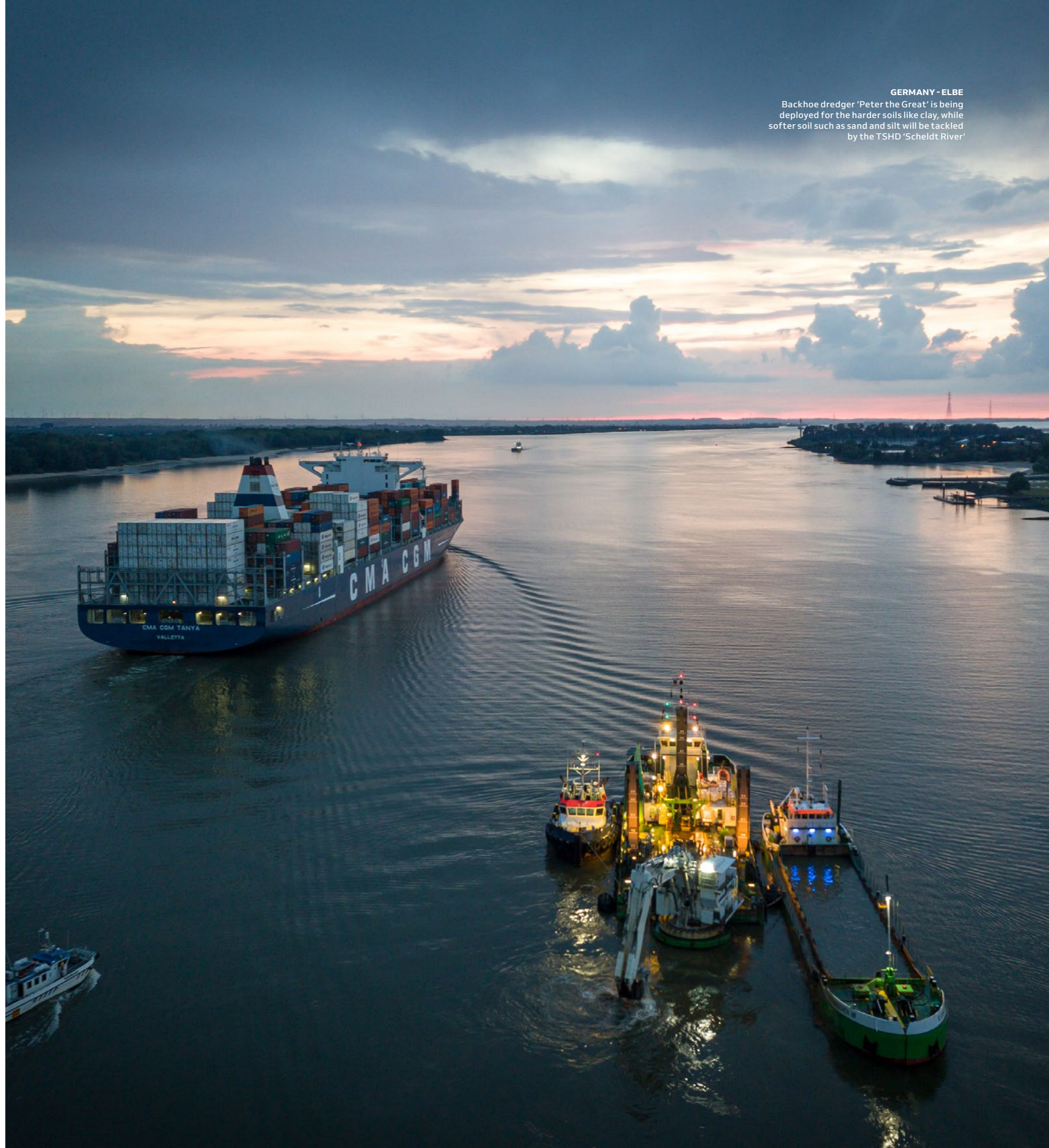
## Elbe and Weser Rivers

### Maintenance dredging

Whilst the maintenance dredging works on the Weser were finalised in December 2018, we continued with the maintenance dredging contract for the Elbe River. Awarded in a joint venture in 2017, these works will continue into Q4 2020. Here we maintain the entire fairway of the Elbe between the North Sea and Hamburg.

This contract is particularly special because our dual fuel, 8,400 m<sup>3</sup> TSHD 'Scheldt River' is the first LNG-fuelled dredger to operate along the Elbe. During the year we performed the biggest LNG bunkering operation ever in Germany with the largest bunkering barge in Northern Europe. Making this pioneering move not only minimises the environmental footprint of the operation, it has also enabled us to build up vast amounts of knowledge about the logistics of using LNG and it sets the bar high when it comes to environmental standards in the dredging industry. In 2019, 'Scheldt River' was continually operating on LNG between February and July. Additionally, we continued carrying out the water injection dredging maintenance contract with our WID 'Dhamra' along the Elbe between May and September.

GERMANY - ELBE  
Backhoe dredger 'Peter the Great' is being deployed for the harder soils like clay, while softer soil such as sand and silt will be tackled by the TSHD 'Scheldt River'



## Bremen

In November 2018, we were awarded the contract for a 12 ha extension of Germany's largest cargo distribution centre, the "GVZ" in Bremen. The reclamation works with TSHD 'Breydel' started in March 2019 and were successfully concluded in July 2019.

TSHD 'Breydel' dredged sand from the outer Weser river in order to increase an area of approximately 120,000 m<sup>2</sup> from an average level of approximately + 1.70 m to + 5.50 m.



GERMANY - BRUNSBÜTTEL  
First ship-to-ship LNG bunkering ever in Germany

## POLAND

### Świnoujście - Szczecin fairway

Unexploded ordnance identification and removal has accounted for most of our activity this year on a project to modernise the Świnoujście - Szczecin fairway in Poland. As the lead contractor of a joint venture, we are designing and executing the construction and dredging works for the adaptation of the fairway.

The fairway provides access from the Baltic Sea, starting at the city of Świnoujście up to the Port of Szczecin, which is located some 66 km further inland. The fairway currently has a depth of 10.5 m

and will be deepened to 12.5 m, enabling the Port of Szczecin to handle larger draught vessels and maintain its competitive position in the Baltic Sea.

The main scope of the project includes design works, the survey and removal of ferromagnetic objects and UXO and capital dredging of more than 20 million m<sup>3</sup>. The dredged soil will be relocated to create two artificial islands in the Szczecinski Lagoon.

In 2019, a broad spread of 14 vessels have been performing the UXO survey, identification and removal works. Up to now, a large number of targets have

been identified and removed, including a 12,000 lb, 'Tall Boy' bomb. In November we also discovered the wreck of a US Boeing B-17 Flying Fortress bomber.

Alongside this vast UXO campaign, we were busy finalising the design of the artificial islands. Civil works also include the revetment and the construction of several quay walls and river banks to accommodate the new design of the fairway.

In Q1 2020, dredging works will start with a diverse spread of vessels, including large TSHDs, a CSD and a backhoe dredger. Awarded last year, the total project is scheduled to be completed in 42 months.

## FRANCE

DEME has a long-established presence in Southern Europe and particularly in France, where it has built up many long-term relationships with port authorities, civil and marine partners.

### Brest

We were awarded a complex design & build, dredging and reclamation project in the Port of Brest. 1 million m<sup>3</sup> of dredged material will be given a new life, creating a new harbour area through engineered consolidation where jacket foundations for regional wind energy projects can be assembled and stored.

Our pioneering, dual fuel TSHD 'Scheidt River' is deployed – making the Brest project the first commercial operation in France to deploy a dredger powered entirely by LNG. Stringent environmental regulations with strict turbidity limits are key for our client and our team.

This is managed through a dedicated environmental dashboard linked to a network of environmental measurements.

### Port La Nouvelle

We have been awarded a capital dredging contract in a joint venture for a new, 200 m quay wall and access channel to Port La Nouvelle. The quay wall is currently under construction. Following its completion, we expect to dredge approximately 2 million m<sup>3</sup> in the access channel.

### Gravelines

In 2019 our long-term contracts continued in the north of France, where we carried out maintenance dredging works of Gravelines port for the 'Département du Nord'.

### Dunkerque

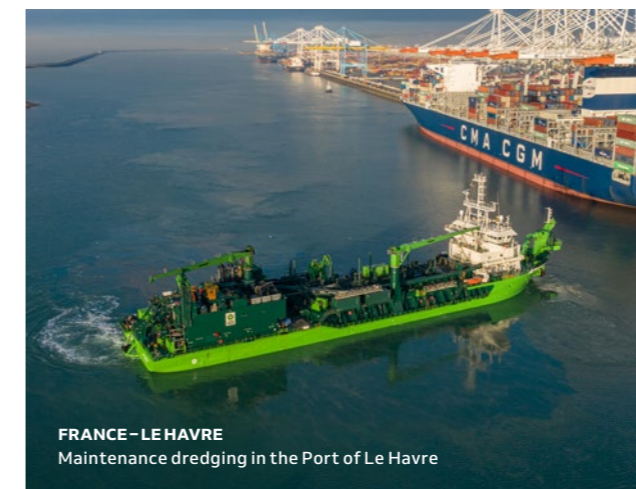
In Dunkerque we continued to run a sediment management project addressing historical pollution in the port. The material is dredged in a dedicated maintenance dredging operation and taken to a dedicated area for a dewatering and drying process. Our customer reuses the dried and dredged material for various projects.

### Gironde

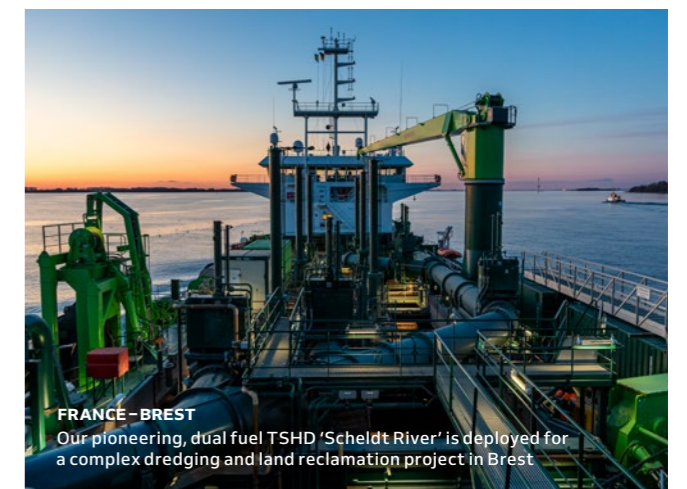
Our 'Dhamra' water injection dredger was made available to maintain the entrance to the Port of Bordeaux in various campaigns.

### Rouen, Le Havre and Saint-Nazaire

The French waterways' public dredging company 'Dragages Ports' has chartered our TSHD 'Breydel' as a replacement for the Authority's own vessel as she undergoes a conversion. 'Breydel' has been performing maintenance work in several ports including Le Havre, Rouen and Saint-Nazaire.



FRANCE - LE HAVRE  
Maintenance dredging in the Port of Le Havre



FRANCE - BREST  
Our pioneering, dual fuel TSHD 'Scheidt River' is deployed for a complex dredging and land reclamation project in Brest





**LA REUNION**  
Our backhoe dredger 'Pinocchio' was a familiar sight at the coastline during the works for the Nouvelle Route du Littoral



**LA REUNION**  
Demobilisation after five years of successful projects on the island. Backhoe dredger 'Pinocchio' is loaded on a semi-submersible ship

## LA RÉUNION

### Nouvelle Route du Littoral

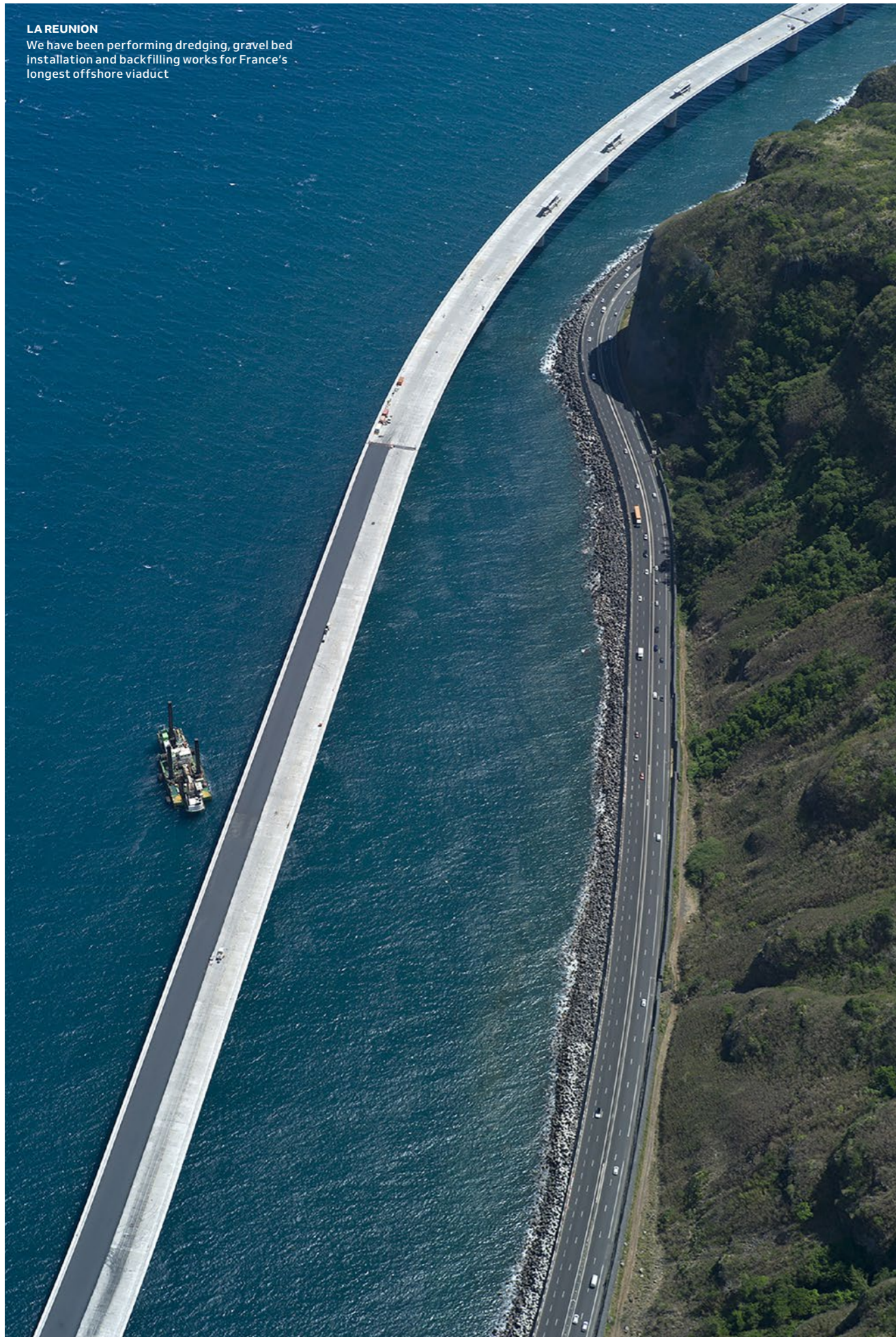
A five-year project in La Réunion came to a successful conclusion in 2019, when the last of 48 gravity-based foundations was installed for the 5,400 m "Nouvelle Route du Littoral" viaduct. We have been performing dredging, gravel bed installation and backfilling works for this unique project, which is in fact France's longest offshore viaduct. The viaduct is part of the new offshore coastal highway between Saint-Denis and La Possession, that replaces the existing coastal road which was subject to rock falls and flooding.

Our backhoe dredger 'Pinocchio', as well as two large 1,000 m<sup>3</sup> split hopper barges and the multicat 'Aramis' were dedicated to the project.

The project faced huge challenges due to a combination of geotechnical and wave climate issues. Ground conditions ranged from sand to very hard, basalt rock from the volcanic activity in the region. Deploying wave prediction models (amongst other tests) proved vital for managing the harsh, oceangoing conditions. This project is a testament to the seamanship of our crew and staff combining international dredging and local expertise with a very strong team composed of people from France, Belgium and La Réunion. Stringent environmental

restrictions included light reduction during night work, monitoring for sea mammals and turbidity management. Regular aircraft and drone inspections were carried out to make sure there were no sea mammals present and we also trained our crew to look out for marine life in the area.

We finished this "once in a lifetime" project to the full satisfaction of our client - and indeed, this is certainly a project they will be telling their grandchildren about in the future.



**LA REUNION**  
We have been performing dredging, gravel bed installation and backfilling works for France's longest offshore viaduct

## ITALY

We have a long-established presence in Italy and an impressive track record in the country and throughout the Mediterranean. New projects are starting in Salerno and Augusta.

### Salerno

In a joint venture we have been awarded a major dredging contract in the Port of Salerno, representing over 3 million m<sup>3</sup> to be realised over two seasons in 2020 and 2021. The operation will augment the port capacities significantly, contributing to the dynamic economy of the Campania region.

### Naples

A maintenance dredging campaign in the Port of Naples continued, with the dredged volumes being reused to construct a new storage area. Essential in the management of the project are stringent environmental regulations on turbidity while dredging and in the return water from the reclamation. The settlement of the dredged, mainly silty material, was accelerated by installing dedicated drainage accompanied by a dedicated follow-up of the consolidation process aiming to create an area that in the future will add storage area for the Port of Naples.

### Livorno

We carried out an emergency deepening operation in the Port of Livorno on behalf of the port authority to improve accessibility to the entrance of the port. This short campaign to augment the draught has improved the traffic flow substantially, taking away a rock hurdle in the port entrance.

### Sicily

In November 2019, we were awarded in a joint venture a civil works project to construct a new harbour extension in the Port of Augusta in Sicily, including 900 m of quay walls, closing new harbour areas of 10 ha.

## PORTUGAL

### Setubal

Our Southern European team is also proud to be starting new marine projects in Portugal, a return to this country for DEME. A dredging project started at the end of the year where we have been tasked with deepening the access channel to the Port of Setubal south of Lisbon in Portugal. Most of the dredged material is being reclaimed into a new harbour area. The dredging project of 3.5 million m<sup>3</sup> is expected to be completed in mid-2020.

## UK

The Environment Agency has appointed BAM/NewWaves Solutions JV (BNS JV Ltd) as one of three service providers able to tender for contracts under Lot 1 of its national Marine and Coastal Works Framework in July.

Under this framework, NewWaves Solutions, our UK subsidiary, and its joint venture partner will be able to bid for projects in Major Marine and Coastal works, with values ranging between £5 million and £50 million. This includes the Lincolnshire Beach Management scheme, for example, previously known as Lincshore. 🌱

# EASTERN EUROPE

## RUSSIA - TAMAN

In Taman we performed dredging works with our TSHDs 'Uilenspiegel' and 'Pearl River'



## RUSSIA

In Russia we have been executing two major projects in 2019, one on the Black Sea and one in the far north, as we returned to the Arctic.

### Taman

In Taman, we are performing dredging works in a dry bulk terminal, which will be used for fertilisers, on behalf of the OTEKO Group.

Our TSHDs 'Uilenspiegel' and 'Pearl River' dredged the access channel to depths of -20 m. On completion in April 2020, the pair will have dredged more than 10 million m<sup>3</sup>. This is a challenging project because of difficult soil conditions, with very hard clay soil, as well as rock inclusions which are present in the area. We also worked at the terminal facility in 2012, but on that occasion we created an access to an oil jetty.

### The Arctic, terminal Utrenniy

In an extremely remote and challenging project we returned to the far north of Russia in the Arctic. In the terminal Utrenniy, which is opposite Sabetta on the right bank of the Ob River, a liquefied natural gas facility is being developed.

Rosatom State Atomic Energy Corporation had tasked us with dredging the 3 km long access channel to the new facility and the basin in front of the LNG berth.

We mobilised several vessels including our CSD 'Amazone', the TSHDs 'Reynaert' and 'Breydel' and in addition we chartered another TSHD to enable us to fulfil the contract within the limited Arctic weather window, which means we can only work for 10 weeks of the year. Additionally, we had a very tight deadline, the contract was signed in July 2019 and we began mobilising the very next day.

Initially we had to dredge through permafrost to gain access to the first berth that was installed some years ago. On top of that we faced some rough weather conditions, which were exceptional even for the Arctic. And indeed there are few places so remote. An accommodation vessel was provided because it was not possible to go onshore. Our team had to take a 45-minute helicopter journey from Sabetta and then fly to Moscow and on to Belgium.

Despite the many difficulties, we finally dredged 5.3 million m<sup>3</sup> of material and completed the work within the weather window in October 2019.

Instead of having a full gasification plant onshore, a facility is being built deploying huge caissons of 300 m x 150 m. This will eventually be towed to the Arctic and the various modules will then be connected. 🌱

## RUSSIA - THE ARCTIC

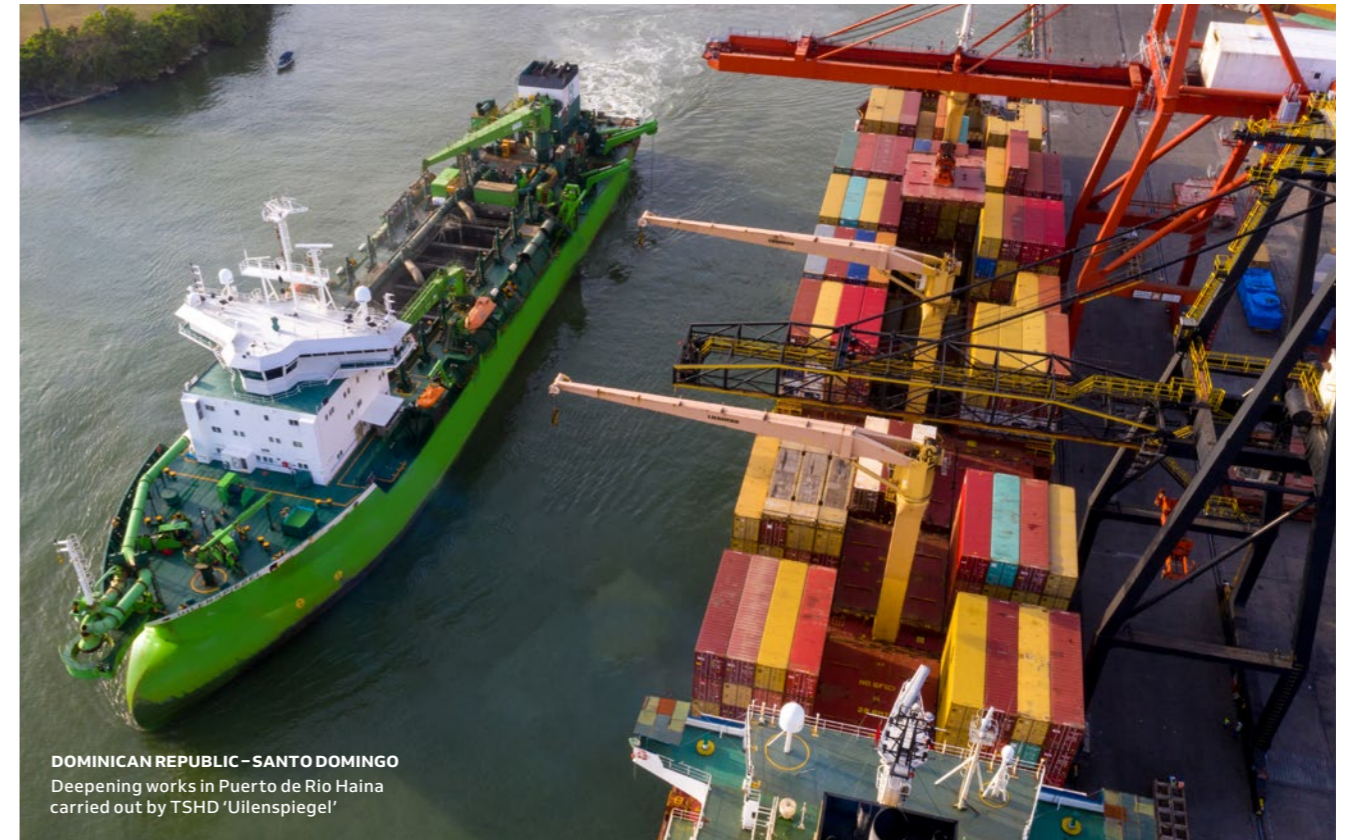
Dredging works for the access channel and basin at the terminal Utrenniy



# AMERICAS



**BRAZIL**  
Dredging of the access channel  
at the Port of Rio Grande



**DOMINICAN REPUBLIC – SANTO DOMINGO**  
Deepening works in Puerto de Rio Haina  
carried out by TSHD 'Uilenspiegel'

## COLOMBIA

### Buenaventura

We were busy in the Port of Buenaventura, on the Pacific Coast of Colombia, performing a maintenance campaign in the access channel. Our TSHD 'Uilenspiegel' eventually dredged 2.1 million m<sup>3</sup>. As well as the access channel dredging, we also carried out a short maintenance campaign for the TC Buen terminal in the port representing 380,000 m<sup>3</sup>.

### Tolu

In November we started a project in Tolu, on Colombia's Caribbean Coast. The Port of Tolu is being extended with a new jetty for general cargo. Works are due for completion in February 2020, with approximately 870,000 m<sup>3</sup> of material dredged by our TSHD 'Lange Wapper'.

## BRAZIL

### Port of Rio Grande

For most of 2019 we were busy at the Port of Rio Grande, in the south of Brazil. This joint venture project involved dredging the access channel plus the berths and the volumes represented 17 million m<sup>3</sup>. We deployed our TSHD 'Pearl River' for the project.

## DOMINICAN REPUBLIC

### Santo Domingo

Our TSHD 'Uilenspiegel' continued to work in the region and went on to the container port of Puerto de Rio Haina in the Dominican Republic. Together with a clam shell dredger, 'Uilenspiegel' dredged material totalling 875,000 m<sup>3</sup>, successfully completing the work in March.



## URUGUAY & ARGENTINA

In December 2017 we were awarded a five-year contract in a joint venture for the deepening and maintenance of the Canal Martín García. The Canal is located between Uruguay and Argentina in the northern part of the 50-km wide, Rio de la Plata estuary. It is the main access channel to Uruguay's second largest port, Nueva Palmira, as well as to the Rio Uruguay, and is subject to a lot of sedimentation, which can amount to as much as 4 million m<sup>3</sup> per year.

The main objective of the dredging programme is to deepen the Canal and subsequently maintain a depth of 10.4 metres. In rocky areas this will be 11.6 metres.

We successfully completed the capital phase of the project in mid-February 2019 with volumes representing 5.4 million m<sup>3</sup>, which included 18,000 m<sup>3</sup> of rock.

Following the capital phase of the project, we also deployed our TSHD 'Minerva' for maintenance work where she will be continually busy for the next years to prevent sedimentation building up in the river delta. TSHD 'Minerva' arrived in the region in July 2018 and is expected to complete her task in June 2023. It is also worth noting that we participated in the original construction of the Canal Martín García in the early nineties. 🌱



URUGUAY  
Maintenance dredging of the Canal Martín García with TSHD 'Minerva'

# ASIA-PACIFIC



**SINGAPORE - TTP1**  
Most of the marine works for the TTP1 megaproject concluded in 2019

## PAPUA NEW GUINEA

### Lower Ok Tedi River

DEME continued to be present on the Lower Ok Tedi River in the Highlands Province throughout 2019. This is the most remote project that we are involved in, as well as the most long-standing: we have been active in the area dredging mine tailings for some 23 years. The lifetime of the mine was recently extended, and we look forward to continuing our ongoing partnership with the mining company.

The contract includes the removal of mine tailings and sediments from the Lower Ok Tedi River system. Our CSD 'Cap Martin' started work in 1997 and has not stopped since. More than 200 million m<sup>3</sup> of material has been removed over the years.

In spite of the project being so remote and situated in an area that is subject to seismic activity, heavy rainfall and significant river water level increases, we boast an exemplary safety record, achieving an eight-year and 3.6 million man-hours LTI-free milestone in 2019.

## SINGAPORE

### Jurong Island Westward Extension (JIWE)

In a joint venture with Starhigh Asia Pacific Pte Ltd. we successfully completed the reclamation filling works in 2019 at the Jurong Island Extension (JIWE) project for JTC, the Singapore Government's lead agency for the development of industrial infrastructure.

JIWE was executed with an exemplary safety record: it is the only reclamation project ever to be awarded the prestigious WSH SHARP Safety Award by Singapore's

Ministry of Manpower. Moreover, in further recognition of its challenging technical character, it was the Singapore Project Management Institute's Project of the Year for 2018, marking the first time a reclamation project has been given this honour.

Since the early 1990s, we have been involved in every stage of the reclamation projects that have led to the amalgamation of seven smaller islands into today's Jurong Island, which is one of the world's largest oil refining and petrochemical hubs.



**SINGAPORE - JURONG ISLAND**  
We successfully completed the reclamation filling works at the Jurong Island Westward Extension project

### Ayer Merbau Reclamation Phase 2

Also on Jurong Island and for JTC, we successfully completed the reclamation filling works for a second major design and build contract at Ayer Merbau. This project included 35 ha of land reclamation to further extend Jurong Island.

The contract has an extensive scope, including the design of the works, the hydraulic study of the reclamation channel, landside site clearance, bund construction with shore protection, dredging of the sand key, soil improvement works, sand supply, reuse of marine dredged material, sorted rock and land-based excavated material, drainage and the maintenance and diversion of the existing drainage system.

The Ayer Merbau Phase 2 reclamation is a complex and challenging project and subject to very strict environmental monitoring. Additionally, the work took place in a very busy maritime area, as the site is located between the production facilities of two major hydrocarbon refining groups. Notwithstanding these challenges, the project has been recognised for its commendable safety performance, winning the 2019 JTC Construction Safety Award in the Infrastructure and Land Reclamation category.



**SINGAPORE - TTP1**  
The last of 221 caissons of the quay wall structure was installed in April 2019

### Tuas Terminal Phase 1

At the end of 2019, most of the marine works for the huge Tuas Terminal Phase 1 (TTP1) megaproject were concluded. The project was performed with our South Korean joint venture partner Daelim Industrial.

During this phase, 88 million m<sup>3</sup> of land has been reclaimed from the sea: the size of the project is perhaps best attested to by the fact that around 2,500 people and 150 vessels were working on the project at any given time. Eighteen months of subsequent earthmoving works on the reclamation footprint remain to be done, starting in January 2020.

Over the years, the project has been awarded several safety-related awards recognising its top-notch performance, including LTI-free safety awards, the Workplace Safety and Health Innovation Prize by the Ministry of Manpower, and the Silver Award for 'Workplace Safety & Health Innovation' from the Singapore Contractors' Association.

Moreover, the rock mound installation pontoon 'Temarock' that was specially developed for the caisson installation scope at Tuas Terminal Phase 1, has been awarded a Platinum Construction Productivity Award by Singapore's Building and Construction Authority (BCA). This award attests to the innovative character of the construction equipment and solutions that have been successfully – and often, as in the case of 'Temarock', as world firsts – deployed on the project.



Over the years we have built a strong presence in the Asia-Pacific region

## TAIWAN

### Kuantang – Third LNG Receiving Terminal, Port Construction and Reclamation Project

In a joint venture with Pan Asia Engineers and Constructors and Hwang Chang General Contractor, we have been awarded a major contract by CPC Corporation, Taiwan, the island's state-owned oil company. The contract includes the dredging and land reclamation works for the creation of near- and offshore land platforms totalling 48 ha, along with the construction of breakwaters, an LNG berth and perimeter dykes for a new greenfield harbour development in north Taiwan. This ambitious project is a key part of the Taiwan Government's scheme to transition away from coal power to cleaner sources of energy.

We are responsible for about 15% of the scope, including the dredging and reclamation of an offshore artificial island, representing around 6 million m<sup>3</sup> of material to be moved. All excavated and dredged soils will be reused as reclamation fill in the different reclamation areas of the project. These areas will subsequently be compacted to meet CPC's requirements.

In 2019, the initial stages of the near-shore reclamation were completed ahead of schedule by means of dry filling. Dredging operations are set to get underway in 2021. We are executing all aspects of this project according to the provisions of the Environmental Impact Assessment, the requirements of the environmental monitoring and management programme, and the local navigation safety requirements.

## THAILAND

### Rayong – IRPC Maintenance Dredging

IRPC, a major Thai petrochemical company, has awarded us the maintenance dredging of its industrial harbour at Rayong. This project will get underway in February 2020.

## THE PHILIPPINES

### Manila – Manila South Harbour Dredging Project

In the Philippines, we completed a brief maintenance dredging campaign at Manila's South Harbour on behalf of Asian Terminals Inc. (a DP World company). Our TSHD 'Congo River' was mobilised for this project, which was completed to the full satisfaction of the client.

## VIETNAM

### Dung Quat - Hoa Phat Steel Plant and Port Construction Project

Hoa Phat JSC is developing a new industrial port at Dung Quat, an industrial hub in Quang Ngai Province (Central Vietnam). We completed the first phase of a project to deepen the port waters, turning basin and channel of the port, and to improve access to the adjacent steel plant, in 2019, with our TSHD 'Congo River'. The second phase of the project then kicked off in September 2019, when 'Congo River' was remobilised to complete the scope by early 2020. 🌱



VIETNAM – DUNG QUAT  
TSHD 'Congo River' was deployed at the Dung Quat project



# MIDDLE EAST & SOUTH ASIA



**IRAQ – UMM QASR**  
Our CSD 'Al Mahaar' was assigned for the dredging works at Umm Qasr port

## EGYPT

### Alexandria

In early 2019, the CSD 'Al Jarraf' and TSHD 'Marieke' were mobilised to complete Phase 2 of the Alexandria West Navy Port dredging and reclamation works. This involved the final dredging of the access channel to a depth of -14.7 m and the port basin to -14 m. Concurrently, the Ras Al Teen Navy Base reclamation works were completed to the full satisfaction of the client.

## IRAQ

### Umm Qasr Jetty Rehabilitation

Our TSHD 'Antigoon' carried out dredging works related to the Basra Gas Terminal jetty rehabilitation, near the Port of Umm Qasr. We executed these works as a subcontractor to the Greek EPC contractor AVAX.

### Umm Qasr Port Yard 5 Construction

We successfully completed dredging works for the excavation of a trench where a new quay wall will be placed for the new Basra Multipurpose Terminal in the Port of Umm Qasr. Our CSD 'Al Mahaar' was assigned for the works. This project was executed as a subcontractor of ENKA, a Turkish EPC contractor.

## OMAN

### Sohar Port Development

Works at the Sohar Port Development were completed in November 2019, after the successful completion of a variation order for the design and construction of an access road to the new industrial area. The dry earthmoving and the compaction of the new industrial land finally totalled volumes of 1 million m<sup>3</sup>. This initial project was swiftly followed by the award of an additional contract for the design and construction of an access road to the port, which was completed in November 2019. We were awarded the design and build contract in a joint venture with Earth Moving Worldwide (EMW).

**QATAR – GEWAN ISLAND**  
An extensive project to develop Gewan Island was successfully completed in October 2019



## QATAR

### Old Doha Port Redevelopment

In a joint venture, we completed the Old Doha Port Redevelopment project in 2019. This project followed the New Port Project where we dredged 3 million m<sup>3</sup> for the realignment of the port's access channel, which would enable the new port to accommodate the largest cruise ships.

The Old Doha Port Redevelopment will enable cruise ships and floating hotels to berth there when the 2022 FIFA World Cup takes place. We executed the dredging works in the turning basin and built a new mooring dolphin structure. In the early part of the year our TSHD 'Nile River' was busy with the dredging, and then the mooring dolphin was completed in the summer.

### Gewan Island

An extensive project to develop Gewan Island, situated next to The Pearl - the artificial island that we built in 2004-2005 - was completed in October 2019.

### Musaimeer Pumping Station

MIC Construct WWL contracted us to perform dredging works for the construction of an outfall diffuser at the offshore end of an outfall pipeline for a desalination plant. The works were completed in early 2019 by our CSD 'Al Mahaar'.

## INDIA

In India we have been performing dredging and land reclamation projects for more than 20 years. Our activities in the region provide a valuable training ground and recruitment base for talented project and engineering nationals.

### Seabird Phase II - West Coast

At the end of 2019, we were nearing completion of the dredging scope of the Seabird Phase II project on the West Coast. The final reclamation, soil compaction and soil improvement works will take place during the course of 2020. Additionally, we deployed our 'PDC 2' pontoon equipped with a Hitachi 1200 crane to remove the balance of 145,000 m<sup>3</sup> of blasted rock. In total, we dredged 11 million m<sup>3</sup> of materials which were reclaimed and reused as much as possible. We also started vibro-compaction works in the reclaimed areas in November 2019. These are due for completion in mid-2020. The dredging, reclamation, soil improvement and revetment works for the project were carried out in a joint venture with Larsen & Toubro.

### East Coast project

In a separate joint venture with Larsen & Toubro, we have completed the first dredging season for a new facility on the East Coast of India. The CSD 'Al Mahaar' started the second season in October 2019 and is expected to complete these works by March 2020. Our TSHD 'Brabo' is also being mobilised for the project.

### Mumbai

Again with Larsen & Toubro, we are developing an interesting solution for a project which will ultimately result in a new coastal road for the Mumbai peninsula. Currently, Mumbai's roads are extremely congested. Therefore a new coastal road is being constructed on reclaimed land in the sea to alleviate the traffic problems. We are providing an innovative, sustainable solution for these unusual reclamation works.

### Gopalpur Port

Phase 2 of the development of Gopalpur Port was concluded in mid-2019 whereby we successfully performed capital dredging works to deepen the access channel to -15 m, while the berthing pockets were dredged to -17.5 m. The TSHD 'Nile River' and CSD 'Ambiorix' were deployed on the second phase of the project, which represented 4.8 million m<sup>3</sup>. Most of the dredged sand was pumped on the beaches to protect the coastline against erosion.

### Kakinada

In the seaport of Kakinada, we were awarded three contracts. Our first project involved an emergency maintenance dredging campaign, which was performed by the TSHD 'Congo River' and finished in early 2019.

In the post-monsoon period we were awarded two contracts from Kakinada Seaports Ltd. The scope of the first contract was to reclaim a terminal area behind Berth 7 which will be used for a small regasification unit. Then in a second assignment we performed a post-monsoon maintenance dredging campaign to restore the depths of the access channel to -12.5 m and the berthing pockets to -16 m. Both works were executed by our TSHD 'Nile River'.

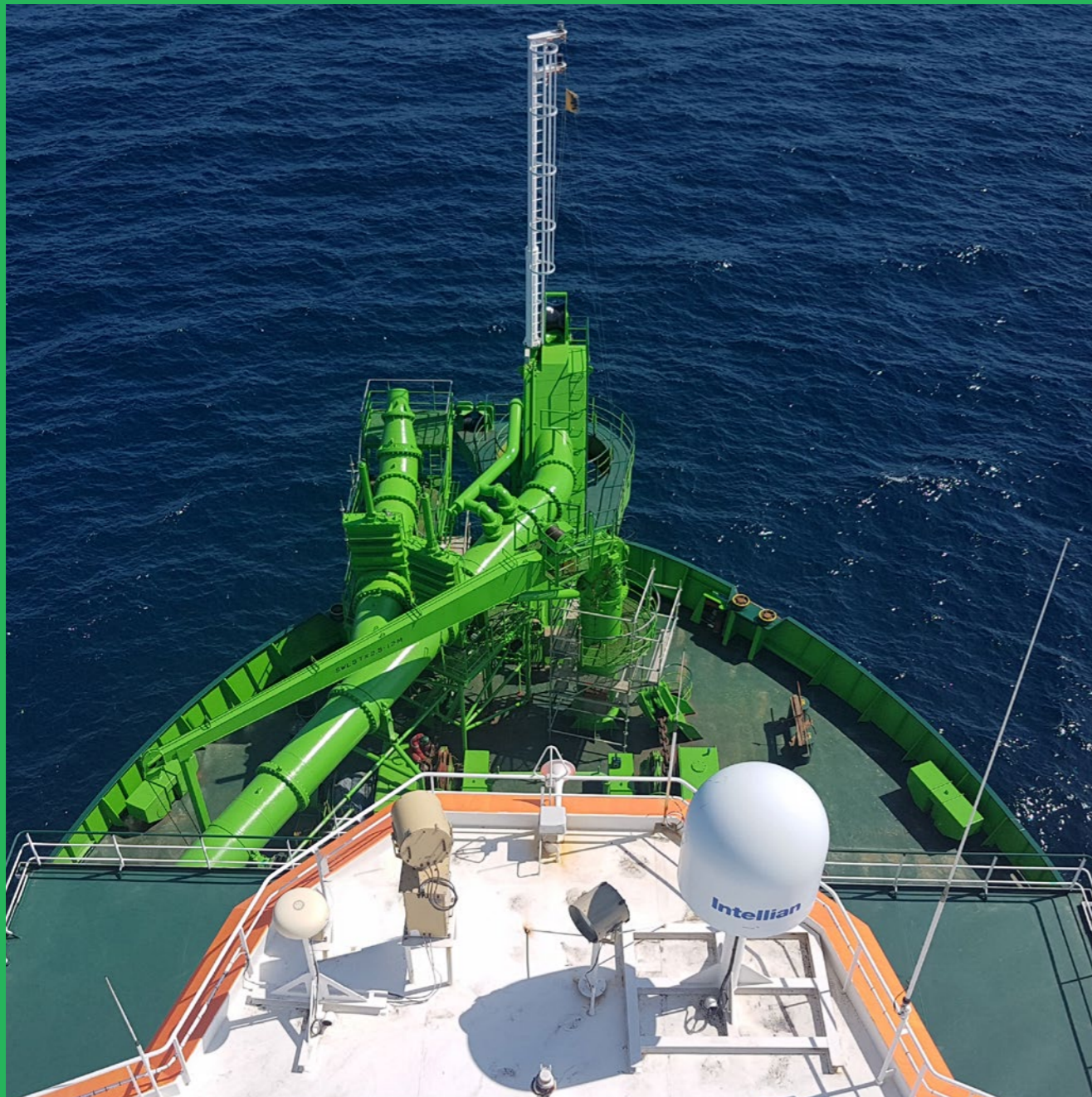
### Krishnapatnam

Our TSHD 'Congo River' performed a maintenance dredging campaign in the Port of Krishnapatnam to restore the access channel to depths of -17 m. The works were finished in March 2019. 🌱



**INDIA**  
TSHD 'Congo River' carried out several maintenance dredging campaigns in India

# AFRICA



DEME has a long-established presence on the African continent and in 2019 we were active in countries from the north to the south performing deepening works, port extensions, maintenance projects, coastal protection and land reclamation.



**BENIN - COTONOU**  
Beach nourishment works represented a total volume of 2 million m<sup>3</sup>

## BENIN

### Cotonou

In 2017 we were awarded a contract for coastal protection works along the Cotonou shoreline. Beach nourishment works completed in mid-2019 and represented a total volume of 2 million m<sup>3</sup>. In a second phase of the project we performed additional revetment works to build an underwater bund of 150,000 tonnes to create the 'Lac Marin'.

We also performed a separate contract on behalf of the Port of Cotonou, which is currently managed by the Port of Antwerp International. We dredged 1 million m<sup>3</sup> of material, deploying our TSHDs 'Brueghel' and 'Marieke', with the work completed in September 2019.

## CONGO-BRAZZAVILLE

### Pointe-Noire

We won a tender for deepening works at the Port of Pointe-Noire in mid-December. On behalf of the port authority we will be dredging 600,000 m<sup>3</sup> in the existing port and in front of the docks. Work started with our TSHD 'Marieke' in January 2020. This is our first project in Congo-Brazzaville.

## ALGERIA

### Mostaganem

We performed the initial trenching works for an HDPE pipeline for a new power plant, close to the Port of Mostaganem in 2018 and in 2019 we carried out the backfilling works with a grab dredger. Works were completed by the end of 2019.

## ANGOLA

### Port of Soyo

In a joint venture we were awarded a five-year contract by Angola LNG to maintain a safe and accessible navigation channel to the Port of Soyo, to guarantee safe nautical access for the export of LNG. In 2019, dredging volumes totalled 3 million m<sup>3</sup>.

### New naval base, Soyo

In November, we were awarded a contract from the government of Angola to carry out dredging activities for a new naval base in the Port of Soyo. Approximately 4.5 million m<sup>3</sup> has to be dredged in the access channel and around 900,000 m<sup>3</sup> reclaimed behind the quay wall. Works are expected to start up with two hopper dredgers in March 2020.



**GABON – OWENDO PORT**  
We obtained three maintenance dredging contracts for Owendo Port

## DR CONGO

### Congo River

Our TSHD 'Orwell' carried out its annual maintenance dredging on the Congo River, handling 2 million m<sup>3</sup> of dredged material. This is part of a 10-year public-private partnership (PPP) with La Congolaise des Voies Maritimes which guarantees a 26-foot draught and safe access to the ports of Boma and Matadi.

## GABON

### Owendo Port

After returning to Gabon again last year, we obtained three new contracts in 2019, all of them in Owendo Port. We performed maintenance dredging on behalf of the French group Bolloré Transport & Logistics, the Gabon Special Economic Zone (GSEZ) and Gabon Port Management (GPM). Overall, we conducted four interventions in front of quay walls dredging to depths of -12 m.

## GHANA

### Tema Port

The prestigious Tema Port expansion project was awarded to DEME in late 2018 and we successfully completed the project on schedule by the end of June 2019. Tema Port is Ghana's main seaport and operated by Meridian Port Services (MPS). To enable it to handle the next generation of container vessels, its accessibility had to be improved and its capacity has been extended. Our scope included dredging 2 million m<sup>3</sup> of rock and we mobilised our seagoing CSD 'D'Artagnan'.

Tema Port is an exceptional project which highlights how DEME finds the best solution, even in challenging circumstances, and how our rigorous Opportunity and Risk Management procedures played a vital role.

The unusual weather conditions, causing an extraordinarily harsh wave climate outside of the port, posed a huge challenge to our tight schedule. Were it not for our swift actions, in particular the mobilisation of our TSHD 'Breughel',

we would have incurred significant delays. With these acceleration measures we successfully completed the project on time and to the full satisfaction of our customer.

**GHANA – TEMA PORT**  
The challenging Tema Port expansion project was successfully completed



## GUINEA

### Kamsar

We performed a maintenance dredging project in the access channel and berthing facility in the Port of Kamsar on behalf of La Compagnie des Bauxites de Guinée (CBG), the largest bauxite producing company in Guinea. This was completed in the first half of 2019 by our TSHDs 'Marieke' and 'Orwell'.

### Conakry

In the Port of Conakry we carried out a maintenance campaign whereby our TSHD 'Marieke' dredged 2 million m<sup>3</sup>.

## IVORY COAST

### San-Pédro

In San-Pédro, the second largest port in the country, we performed capital dredging works for an extension to the port on behalf of civil contractor Afcons Overseas Ltd. Our scope involves deepening the access channel to -15 m and reclamation works for a new, 800 m multipurpose terminal, where we will dredge in front of the berths. Our TSHDs 'Orwell' and 'Marieke' were mobilised in October. The project is due to complete in January 2020.



## NIGERIA

### Bonny and Onne

We continued with maintenance dredging works which are part of a long-term PPP with the Bonny Channel Company, a joint venture with the Nigerian Ports Authority. The TSHDs 'Breughel' and 'Marieke' dredged the access channel to the LNG terminal in Bonny to ensure the ports of Onne and Harcourt remain accessible.

### Bonny and Bodo

We have been awarded a contract to help elevate wetlands between Bonny and Bodo, where a new road will be built. Covering a stretch of 35 km, we expect to reclaim 2 million m<sup>3</sup> of sand. In the last months of 2019 we were making preparations, carrying out bush clearing. Our TSHD 'Marieke' will be deployed, with work expected to get underway early 2020.

### Elegushi Island

The second phase of the dredging and land reclamation works for the extension of Elegushi Island in the Lagos Lagoon were ongoing during 2019. We deployed the CSD 'Rubens', which eventually handled approximately 2 million m<sup>3</sup> of material.



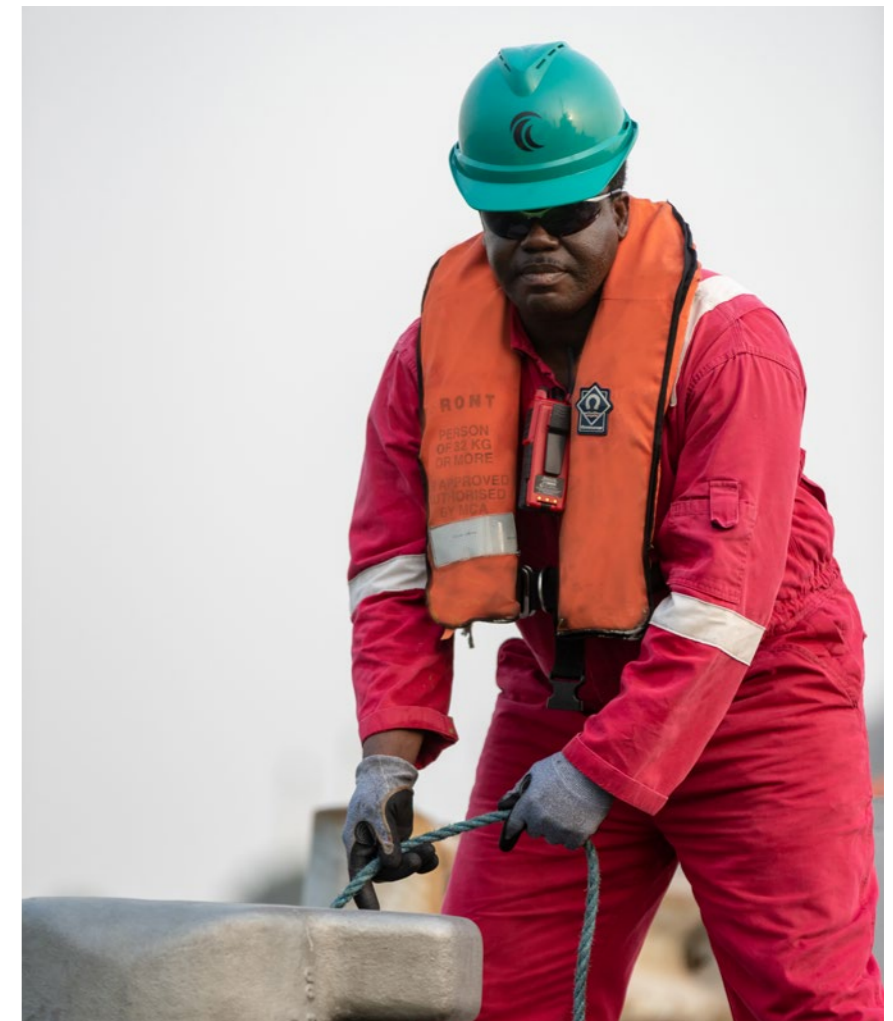
# CTOW

**Combined Marine Terminal Operations Worldwide (CTOW)** - a joint venture company owned by DEME, Herbosch-Kiere and Multiraship - offers a full package of specialist maritime services for the operation of dedicated terminals.

CTOW is actively looking to expand its activities inside and outside Africa. CTOW currently operates five vessels in Nigeria, four of which are on long-term contracts. All of the vessels are crewed by Nigerian nationals and are operated by CTOW's Nigerian subsidiary CMTON Ltd.

At the Nigeria LNG Ltd (NLNG) terminal on Bonny Island, CTOW has two newbuild, 85-tonne bollard pull ASD tugs, 'CTOW Kathy' and 'CTOW An Sofie' deployed. Additionally, a 60-tonne bollard pull ASD tug, 'CTOW Lala', which had her contract extended in November, and a Stan Tender 1905 pilot launch, supported NLNG throughout 2019.

Apart from the services at the NLNG terminal, CTOW provides harbour towage services in the Port of Onne, deploying the 60-tonne bollard pull ASD tug 'CTOW Bieke'. In 2019, CTOW introduced a new Vessel Management System (VMS), combining the best practices from all three shareholders. The new VMS is user friendly and, by enabling documentation to be scanned with smartphones, reduces the administrative burden substantially. This new VMS has been audited and CTOW now proudly operates under its own Document of Compliance (D.o.C.).





# DEME BUILDING MATERIALS

DEME Building Materials (DBM) specialises in the extraction, transport, processing and supply of marine aggregates for the European construction industry.

2019 was a busy year in the Benelux, France and the UK, with DBM's three specialist vessels fully occupied throughout the year. Generally, the demand for marine aggregates is climbing and there is also increasing interest in the dry supply of sand for filling works and sub-foundations.

There was a lot of activity in France particularly, especially because of the many construction projects going on around Paris. This had a positive effect on the activities in Le Havre, but also the various production terminals in the ports of Dieppe, Fécamp and Boulogne-sur-Mer experienced strong, local demand for marine aggregates.

## Record breaking port call

DBM's TSHDs 'Charlemagne' and 'Victor Horta' regularly call into the Port of Fécamp, and continue to hold the record for the largest ships to sail into the port. This highlights the fact that DBM's vessels can still access smaller ports thanks to their manoeuvrability and their very skilled crew.

Belgium and the Netherlands also saw a steady demand. The situation in 2018, where there was a prolonged low

availability of river dredged aggregates from Germany due to the exceptionally low water levels in the Rhine, which hinders transport by barge, did not repeat itself in 2019.

DBM's production facilities in Vlissingen, Amsterdam and Ostend are free of such restrictions and have shown in the past that they can offer a reliable supply of good quality construction aggregates. DBM's terminals all put in a strong performance with Vlissingen and Amsterdam both producing over 1 million tonnes per year.

## Large infrastructure projects

In the Netherlands, DEME is involved in the execution of three large infrastructure projects - the RijnlandRoute, New Lock Terneuzen and the Blankenburg Connection - where DBM is supplying marine aggregates: sea sand for landfilling purposes, as well as processed and certified marine sand and gravel for the production of ready-mix concrete.

DBM supplied sand and gravel from the production terminal in Vlissingen to the New Lock Terneuzen project. Supplies to

this construction project are estimated to take another two years to complete.

DBM's marine aggregates are also used in the construction of the IJmuiden Lock, which will be the world's largest sea lock once completed. Supplies will be finalised in the course of 2020.

For the Blankenburg Connection, DBM carried out the sand supplies for the filling of the temporary cofferdams that form the construction pit for the fabrication of the tunnel elements. On the riverside, regular sea sand was supplied initially. However, for the future supplies on the landside of the dyke, we will supply desalinated sand to protect the water table. DBM's vessels have the technical capability to process and desalinate the sand onboard prior to dry discharge on shore.

A point of concern is the particular situation in the Netherlands linked to environmental regulatory concerns around PAS (involving NOx emissions) and PFAS that also impacts the construction industry. As a consequence, general demand in the Netherlands dropped off in the second half of 2019 due to many building projects being suspended by lack of various directly or indirectly required environmental permits. This situation will have to be followed up into 2020, where it will provide both challenges and opportunities for DBM.



DBM carried out the sand supplies for the Blankenburg Connection





# OFFSHORE

**DEME Offshore is a global solutions provider in the offshore oil, gas and renewables industry.**

We have an unrivalled track record in the transport and installation of foundations, turbines, inter-array cables, export cables and substations for offshore wind farms. In the oil & gas industry we are experts in landfalls and civil works, rock placement, heavy lift, umbilicals and installation and decommissioning services. By operating a high-tech and versatile fleet of vessels, we offer flexible solutions for the most complex offshore energy projects.



# RENEWABLES

APOLLO

**DEME Offshore provides the most comprehensive and innovative solutions in the renewables industry. We offer flexible solutions for foundation, cable (export and inter-array), turbine and substation installation and maintenance activities. By operating a high-tech and diverse fleet of installation, cable laying and multipurpose vessels, we are able to help our customers successfully achieve the most demanding offshore energy projects.**

Pushing the boundaries of innovation is at the heart of DEME Offshore. We continuously develop new techniques, methods and tools for the fast-evolving offshore wind industry. As an example, we developed the innovative, dual-lane cable installation system on board of our cable installation and multipurpose vessel 'Living Stone', improving production rates and reducing costs for cable installation.

Our giant new offshore installation vessel 'Orion' will bring a game-changing installation concept to the offshore energy market. The DP3 vessel will feature an unrivalled combination of exceptionally high transport and load capacity, impressive lifting heights and green technology.



**BELGIUM**  
A touch of the SeaMade Offshore Wind Farm coloured the Antwerp skyline when the transition piece for the offshore substation was transported to Rotterdam for load-out



**BELGIUM**  
At the SeaMade wind farm, our cable installation and multipurpose vessel 'Living Stone' successfully completed the pull-in of two export cables into Elia's Offshore Switch Yard

## BELGIUM

### SeaMade

Foundation installation at the SeaMade offshore wind project, which will comprise 58 Siemens 8.4 MW turbines, progressed well during 2019. Located around 40 km off the coast of Ostend in Belgium, SeaMade is actually a combination of two wind farms, Seastar (246 MW) and Mermaid (266 MW), and DEME Concessions has a participation in these two wind farms. SeaMade NV is responsible for the simultaneous development of Mermaid and Seastar, resulting in the single largest wind farm financed and built in Belgium.

SeaMade really highlights the breadth of DEME Offshore's capabilities as we were awarded several contracts for the development of this project. With our partners we

are responsible for the full Balance of Plant (BoP) for the project, which includes the design, manufacturing and installation of turbine foundations, offshore high voltage substations, export cables and inter-array cables and the installation of the Siemens wind turbines.

**SeaMade really highlights our capabilities as we were awarded several contracts for the development of this project.**

In 2019, we completed all of the soil investigations, design, soil preparations (including UXO inspection and removal), as

well as the manufacturing and installation of the foundations (including the foundations for the two substations). Offshore foundation installation operations started in September 2019 and were concluded in January 2020.

The seabed is a considerable challenge because it has thin layers of competent sand which means there is a risk of a 'punch through' - the jack-up legs could penetrate too far down. Following detailed studies of the conditions, and to mitigate the risk, we invested in new, enlarged, spud can shoes for our jack-up vessel 'Innovation' and we developed a very safe and careful jack-up strategy with our highly skilled crew.

Although the SeaMade project consists of two wind farms – each has its own offshore substation and is connected to the Modular Offshore Grid switchyard individually - we treated it as one foundation

installation campaign. The project has also progressed smoothly because of a very strong working relationship with people in our customer's organisation, many of whom we had previously worked with on the Rentel Offshore Wind Farm. Our engineering teams work very well together and have developed a robust and successful wind farm design and construction programme.

Towards the end of the year, we were also preparing for the export cable pull-ins at the substations. When the export cable, manufactured by Hellenic Cables in Greece, is installed, we will then pick up the inter-array cables from JDR in the UK and will commence with the connections of the foundations with the offshore substations string by string. As from June 2020, the installation of the Siemens turbines is expected to get underway, with the wind farms due to be commissioned by the end of the year.

What makes the SeaMade project really remarkable is that we only signed the contract in December 2018, and we aim to deliver the full BoP works for two wind farms in only two years.

## Modular Offshore Grid

*Pioneering project delivered months ahead of schedule*

In August 2017, the Belgian transmission system operator Elia awarded the Modular Offshore Grid (MOG) submarine power cable project to DEMA and just two years later, we successfully finished this pioneering project four months ahead of schedule. His Majesty the King of Belgium officially inaugurated the MOG on September 10, 2019.

We were awarded an EPCI contract which included the design, engineering, procurement, manufacturing, installation, testing and commissioning of 85 km of submarine power cables. The MOG groups and connects the energy from four new offshore wind farms, so that it can be injected into the Belgian onshore grid at the Stevin 380kV substation in Zeebrugge via fewer sea cables, compared to the traditional 'one export cable per wind farm' approach.

As the MOG plays an essential role in the transition towards more renewable energy, it is of high strategic value and the timely realisation of the project was therefore crucial.

DEMA Offshore knew it had to be 'first time right' and we took a 'Formula 1' approach, with each step of the project thoroughly prepared in advance. For example, pulling the cables into the offshore switchyard went very smoothly with the last cable pulled in in a record time of only six hours, which was really a feat given the complexity of this project. Another key challenge was the timely completion of the cable connections at the beach pits in order to avoid idle time during the tourist season when works at the beach were not allowed.

**—  
Readiness and preparedness were at the heart of the project, together with a great cooperation with our customer and a wonderful team.  
—**

Readiness and preparedness were at the heart of the project, together with a great cooperation with our customer and a wonderful team. In total some 500 people have been working on the project, including 31 different vessels over time. Despite the number of people involved, this project concluded with zero LTIs.

Our revolutionary cable installation and multipurpose vessel 'Living Stone' and our new TSHD 'Bonny River' were deployed, alongside 'Neptune', which we used as an accommodation vessel so we didn't have to rely on crew transfer vessels getting in and out of the field, which is 40 km from Zeebrugge. Our other vessels included the TSHDs 'Lange Wapper', 'Reynaert' and the rock placement vessel 'Flintstone' which, with their very experienced crew, all performed beyond expectations.



### BELGIUM

The MOG project included the design, engineering, procurement, manufacturing, installation, testing and commissioning of 85 km of submarine power cables



**FRANCE**  
We will undertake the transport and installation of the monopiles and transition pieces for the first offshore wind farm ever to be installed in France



**GERMANY**  
The Offshore Transmission Module (OTM) topside on the Albatros Offshore Wind Farm was successfully installed in March 2019

## FRANCE

### Saint-Nazaire

A consortium including DEME Offshore was delighted to be awarded a major engineering, procurement, construction and installation (EPCI) contract for 80 foundations for the OWF Saint-Nazaire project. It will be the first offshore wind farm ever to be installed in France.

DEME Offshore is very honoured to contribute to France's ambitious energy transition targets with this 480 MW development, owned by EDF Renewables and Enbridge. The project is located 15 km off the coast of Saint-Nazaire in western France.

In the consortium, we will undertake the transport and the installation of the monopiles and transition pieces, while

Eiffage Métal will carry out their design and fabrication.

Design activities already kicked off in order to start the production of the foundations in spring 2020. The first foundations will be installed offshore, in rocky seabed conditions and up to a 25 m water depth, starting in spring 2021, with completion being planned in summer 2022.

This contract highlights our technical expertise in providing innovative solutions for the offshore wind industry. The Saint-Nazaire project will deliver rock drilled monopiles, a new step forward in the offshore wind industry. A 450-tonne offshore foundation drill, with a massive 7.6 m diameter full face drilling head, is being designed and manufactured. In addition, we are also designing and fabricating a wave protection system to reduce its exposure to the long marine

Atlantic swell and enhance its marine operational working time. The so-called MODIGA will also assist us with the monopile drilling, installation and grouting.

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**We are very  
honoured to  
contribute to France's  
ambitious energy  
transition targets.**  
—

Another key factor in this project has been the cooperation of the local authorities, mayors, communities, fishermen and environmental groups. We want this support and participation to continue and aim to keep the community informed about progress and developments regularly and transparently.

## GERMANY

### Hohe See and Albatros

We were Siemens' Engineering, Procurement, Construction and Installation (EPCI) partner for the 497 MW Hohe See Offshore Wind Farm and for the 112 MW Albatros Offshore Wind Farm and were responsible for the design, manufacturing and offshore installation of all the foundations, as well as the offshore installation of the Offshore Transmission Module (OTM) topside on Albatros.

The offshore installation in spring 2019 of the remaining foundations for the Hohe See Offshore Wind Farm and all the foundations for the Albatros Offshore Wind Farm were executed in record time with our heavy lift jack-up vessels 'Innovation' (monopiles) and 'Sea Installer' (transition

pieces and anode cages). The OTM topside on the Albatros Offshore Wind Farm was also successfully installed in March 2019 by our offshore installation vessel 'Innovation' with the 'Pacific Osprey' as a feeding vessel.

Part of the key to success was the unique collaboration between the various teams involved in the realisation of these two wind farms. Our customer, Siemens, brought us in at a very early stage of the project – in fact already in the tendering phase – and this has led to a very positive cooperation.

Jointly, we developed and delivered a successful project to our end-client EnBW. This positive cooperation with Siemens will be further highlighted when we install the Siemens turbines at the SeaMade Offshore Wind Farm in 2020 on the foundations we have designed, manufactured and installed – just like we did at Hohe See and Albatros.

# UK

## Hornsea One

Following on from our work on the foundations and export cable installation at the Hornsea One project Offshore Wind Farm, DEME Offshore successfully installed the turbines in 2019.

Ørsted's Hornsea One project is not only the largest offshore wind farm in the world but it is also located 120 km offshore. Together with Fred Olsen, we installed 174 Siemens Gamesa 7 MW turbines between February and October, deploying our offshore installation vessel 'Sea Installer'.

'Sea Installer' is ideal for turbine installation and because there were two very similar vessels working on the project, we were able to offer our customer a very robust and efficient solution for the installation.

The project was executed with an outstanding safety performance and operations went very smoothly with a close and good teamwork between us, Ørsted and Siemens Gamesa. The two installation vessel setup was very efficient for our customer as both vessels could use the same foundations at the quayside and were berthed in the same position, facilitating a quick and smooth operation for our customer, with built-in redundancy if there should be any issues.

## Hornsea Two

DEME Offshore has been awarded a major contract for the transport and installation of 165 foundations at Ørsted's Hornsea Two Offshore Wind Farm in the UK. Additionally, DEME Offshore secured the contract for the transport and installation of the turbines at the wind farm.

The 1.4 GW Hornsea Two Offshore Wind Farm is located approximately 89 km off the Yorkshire coast and will meet the electricity needs of over 1.3 million homes per year. The wind farm borders the northern and western edge of the Hornsea One wind farm, where DEME Offshore was already involved in the foundations, turbines and export cable works.

## East Anglia ONE

The benefits of the two-vessel turbine installation solution is really highlighted at the East Anglia ONE Offshore Wind Farm project, where we are installing 102.7 MW Siemens Gamesa turbines off the Suffolk coast in the UK.

In this project we are working directly for Siemens Gamesa Renewable Energy and we are deploying our renowned sister vessels 'Sea Installer' and 'Sea Challenger' side by side. The project was initiated by 'Sea Installer', but after finishing the Hornsea One project 'Sea Challenger' joined the installation campaign at East Anglia ONE.

**Our customer has been very satisfied with this unique, duo-vessel solution.**

By using the two sister vessels we can make sure the project is kept on track for our customer. A positive element in this dual vessel setup is naturally the built-in redundancy. But having two similar vessels deployed also brings huge benefits in terms of preparations, approvals, planning, etc. Everything is more efficient and less costly because the documentation, marine warranty survey and sea fastening etc. are ditto. Operations started in June 2019 are due to conclude in spring 2020. Our customer has certainly been very satisfied with this unique, duo-vessel solution.

## Moray East Offshore Wind Farm

DEME Offshore was awarded an Engineering, Procurement, Construction and Installation (EPCI) contract for the 950 MW Moray East Offshore Wind Farm. Located in the Outer Moray Firth, off the northeast coast of Scotland, Moray East will comprise 100 x 9.5 MW MVOW wind turbines. We are responsible for the EPCI contract for the turbine foundations and three offshore substation platform foundations, as well as for the transport & installation of the three substation platforms.

In early 2019, we started manufacturing the pin piles and in spring installation began with our new, self-propelled DP2 offshore installation vessel 'Apollo'. Towards the end of the year approximately 85% of the 309 piles had been installed, enabling us to remain firmly on track for the foundation installation schedule, despite the challenging weather conditions in northern Scotland.

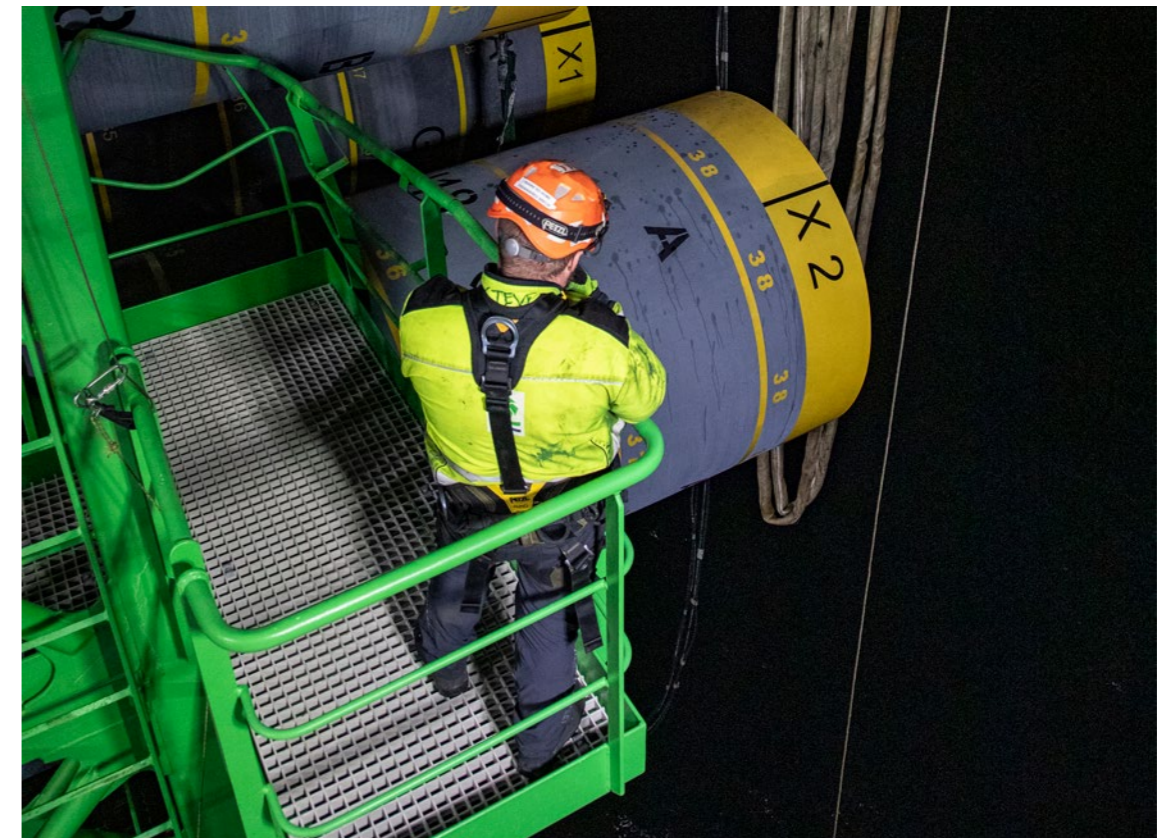
We have made sure local content is maximised. The piles are partly manufactured locally in Scotland and the jackets are going through the Smulders yard at its UK base in Newcastle for final assembly. Piling is expected to be completed by the end of February 2020 if weather conditions are favourable and then installation of the foundations will start in spring 2020 when 'Orion' joins the fleet, our game-changing, new offshore installation vessel which can comfortably load five jackets per trip, even when these are more than 80 m high and weigh 1,000 tonnes each.

To make sure we could adhere to the tight construction schedule, there are some 15 production locations involved in this huge project, representing more than 4,300 people. We split the manufacturing sites of the jacket and pile foundations so they could be produced efficiently by several fabrication locations at the same time.

Another important factor to maximise efficiency is a specially designed installation template, which is 28 m x 28 m. This tailor-made template hangs underwater under the 'Apollo' and is guided into position by the jack-up legs. Then one pile is lowered via a large moonpool and two other piles are lowered overboard through a guiding frame. Our patented piling template enables us to carry out this operation with precision accuracy and there is no need for any adjustments.

## UK

Towards the end of 2019 approximately 80% of the 309 pin piles had been installed at the Moray East Offshore Wind Farm



## UK

At Moray East we are responsible for the EPCI contract for the turbine foundations and three offshore substation platform foundations, as well as for the transport & installation of the three substation platforms.



**UK**  
We were awarded an EPCI contract for the inter-array cables for the 450 MW Neart na Gaoithe Offshore Wind Farm

### Neart na Gaoithe Offshore Wind Farm

In September 2019, we were awarded an EPCI contract for the inter-array cables for the Neart na Gaoithe Offshore Wind Farm which is being developed by EDF Renewables on a site located around 16 km from Fife Ness in Scotland.

Due to be commissioned in 2022, Neart na Gaoithe will encompass 54 wind turbines, of 8 MW each, with approximately 105 km of inter-array cables, generating up to 450 MW on completion.

Under the EPCI contract we are responsible for the engineering, cable design and manufacturing, load-out and transportation, cable installation and burial, post-installation survey, termination and testing, as well as the provision of cable protection systems.

In 2019, preparations got underway with a focus on the engineering, interfacing with the foundations contractor, documentation and procurement of the cables, which are being manufactured by JDR Cables in the UK.

The cables are due to be ready for installation in the first half of 2021, with installations scheduled for the second half of 2021. Our DP3 installation and multipurpose vessel 'Living Stone' will be deployed, together with our own trenching machine, CBT 1100.

This project highlights the extensive support we can provide to our customers in the early stages of a project, including detailed engineering work.



**US**  
We aim to offer US customers the safest, most reliable and efficient offshore wind solutions

## US

In recognition that the offshore wind industry is no longer confined to the waters of northern Europe alone, DEME Offshore has established an office in Boston to help realise the ambitious renewables plans in the US market, where more than 25 GW of offshore wind energy is slated in the coming years along the northeast coast.

Given the number of proposed offshore wind projects from Virginia to Maine, we are keen to be established right from the start of this new industry in the US. Over the last few years we have been setting up local partnerships in the US, ranging from maritime companies to tug operators and local supply companies.

After two years of preparatory business development works, DEME Offshore is able to offer all required services to install foundations, cables, scour protection, wind turbines and substations. Strong relationships have been built up with US ports and terminals for the related logistics, and engagements have been made with US maritime institutes to train US citizens in this new industry. DEME Offshore is ready to perform all services to deliver offshore wind farms in the US market. Our longstanding experience and expertise as a leader in the European offshore wind market will be brought to the US and combined with the local knowledge provided by local US partners.

## CHINA

### Pinghaiwan

COSCO-DEME New Energy (CDNE) is performing a contract to install 20 turbines, of 6 MW each, for the Pinghaiwan Phase 2 offshore wind project in the Putian Pinghai Bay area in the Chinese Province of Fujian, around 150 km northeast of Xiamen.

Our DP2 jack-up vessel 'LiYa' (ex-Goliath) is now working on her fourth project in China. After having installed turbines on the Binhai H2 and Dafeng H3 project in 2018, 'LiYa' performed works on the Lufeng Power Plant cooling water system, located 200 km east of Hong Kong and Shenzhen. In close cooperation with CDNE, the customer was able to optimally use the strengths of 'LiYa' and finish the project 53 days ahead of schedule.

The 20 turbines on the Pinghaiwan project will be installed on different types of foundations. 'LiYa' will perform works on the typical Chinese foundation called High-Rise Pile Cap, which consists of eight inclined installed piles of 2 m in diameter and a concrete cap 5 m high and 16 m in diameter. This foundation is often used in locations with soft top layers and harder layers underneath. 'LiYa' is performing lifting works for the completion of the cap and the lower part of the turbine.

CDNE is a joint venture formed in 2017 between DEME and COSCO Shipping, the largest shipping company in the world. In 2018 'Goliath' was renamed 'LiYa' (Elegant Power) and now operates under the Chinese flag.

## TAIWAN

### Hai Long Offshore Wind Farm

The Hai Long Offshore Wind Project signed Taiwan's first, large-scale Balance of Plant Preferred Supplier Agreement with CSBC-DEME Wind Engineering (CDWE). The Hai Long Project team consists of Canadian-based independent power producer Northland Power Inc. and Singapore-based Yushan Energy Co. Ltd., which have joined forces to develop the Hai Long 2 and 3 wind farms in zones 18 and 19 offshore of Changhua. In total, the Hai Long project represents more than 1 GW.

Engineering, Procurement, Construction and Installation (EPCI) of the foundations, inter-array cables, export cables and transportation and installation of the turbines are included in the BOP package. From the start of the bidding process, Hai Long and CDWE worked closely together, committing to meeting the localisation requirements of the Industrial Development Bureau and Bureau of Energy. The 'Industrial Relevance Plan' is one of the top priorities for the Hai Long Project.

To that end, CDWE launched a large-scale market study of Taiwanese steel fabricators and marine engineering services providers in February 2019 to assess local capabilities and set up a local team under its direction. In early 2023, offshore installation works are expected to take place, making optimal use of local materials and skills in constructing the Hai Long project.

### Zhong Neng Offshore Wind Farm

CDWE and the Zhong Neng Wind Power Corporation Preparatory Office have signed two contracts for the Zhong Neng Offshore Wind Farm project. The contracts include the transportation and installation of 33 jacket foundations, as well as a Preferred Bidder Agreement for the transportation and installation of the wind turbines.

The 300 MW Zhong Neng Offshore Wind Farm, developed by China Steel Corporation together with the Danish developer Copenhagen Offshore Partners (COP), is planned for completion in 2024. In order to implement the localisation policy required by the Taiwanese government, the Zhong Neng Wind Power Corporation Preparatory Office has worked closely with CDWE to optimise local content.

### Changfang-Xidao Offshore Wind Farm

CDWE was also awarded a contract for the WTG transport and installation scope of CIP's 600 MW Changfang-Xidao Offshore Wind Farm. The scope includes the transport and installation of 62 turbines, with an installation schedule divided in two phases between 2021 and 2023.





**TAIWAN**  
We signed a contract for the transportation and installation of 33 foundations, as well as a Preferred Bidder Agreement for the transportation and installation of the turbines at the Zhong Neng Offshore Wind Farm



Multipurpose drilling vessel 'Omalius'

## G-TEC

G-tec is our specialist geoscience services company, which provides geotechnical and geophysical offshore and marine site investigations, as well as environmental surveys to both the renewables industry and the oil & gas sector. 2019 was a very busy year, with full occupancy of G-tec's dedicated, multipurpose drilling vessel 'Omalius'.

### Neart na Gaoithe Offshore Wind Farm

G-tec started the year with the finalisation of the geotechnical site investigation campaign for the Neart na Gaoithe Offshore Wind Farm, which will be located 15.5 km off the Fife coast in Scotland. The offshore operations from the 'Omalius' were finished mid-January

2019, while the lab testing and reporting continued until the end of April 2019.

### German Bight

Ørsted awarded two offshore geotechnical investigation projects to G-tec in the German Bight area, which were successfully executed over a period of four months, including the soil sampling, seabed Cone Penetration Testing (CPT) and down-the-hole CPT operations. A variety of insitu measurements were also produced through seabed CPT, down-the-hole CPT and thermal CPT operations.

After completing the activities on the Gode Wind Offshore Wind Farm 03 + 04 project, 'Omalius' then proceeded to Ørsted's German Cluster Offshore

Wind Farm 01 project. The offshore works were carried out with a high level of efficiency, enabling G-tec to complete the work three weeks ahead of schedule. An extensive laboratory testing period will continue into 2020.

Ørsted was very pleased with G-tec's performance and delivery of high quality samples and results, faster than planned and congratulated it for the QHSE culture developed on the 'Omalius', stressing that it matched the highest QHSE standards.

### SeaMade

G-tec undertook an offshore geophysical survey of the SeaMade offshore wind farms, located off the Belgian coast. The purpose of the geophysical site investigation

was to collect enough data to be able to characterise the seabed and identify possible obstructions and UXO along the wind farms' cable routes. This survey was completed at the end of May 2019.

## 2019 was a very busy year, with full occupancy of G-tec's dedicated multipurpose drilling vessel 'Omalius'.

G-tec also performed UXO clearance operations for the SeaMade project including the identification of potential UXO targets

near the turbines and seabed clearance within the inter-array and export cable corridors. During the project, 295 targets were cleared, including two unexploded bombs which were handled by the Belgian military.

### Dunkirk Offshore Wind Farm, France

A consortium composed of G-tec, Geotec and Igeotest was contracted by RTE to perform a geotechnical campaign for the export cable route and the offshore substation for the Dunkirk Offshore Wind Farm project.

G-tec was responsible for the substation scope of work, which took place in challenging shallow water conditions of around 17 m LAT. We performed a range of activities including

seabed CPTs with a target depth of 20 m and borehole sampling in depths of up to 60 m. Works were successfully executed in November 2019.

# LANDFALL CONSTRUCTION, ROCK PLACEMENT AND OFFSHORE CIVIL WORKS



## NORWAY

We performed several rock installation projects around the Norwegian Continental Shelf on behalf of Equinor

**DEME Offshore is one of the world's leading experts in subsea rock placement, landfall constructions and offshore civil works. Our high-tech DP2 subsea fallpipe vessel fleet had high occupancy rates during the year. We also secured major contracts in Canada and Taiwan.**

### WindFloat Atlantic, Portugal

DEME Offshore carried out the rock placement activities for the pioneering WindFloat Atlantic project, 20 km off the coast of Viana do Castelo in Portugal, in August and September 2019. The facility has three wind turbines mounted on floating platforms which are anchored to the seabed only with chains at a depth of 100 m. This is the first floating wind farm in continental Europe.

Our work was necessary to protect part of the 30 km export cable. It was not possible to perform trenching for a 7 km section, therefore it had to be protected by rock placement, especially because it is quite close to the main shipping channel and vessel waiting areas. We deployed a dedicated fallpipe vessel and approximately 150,000 tonnes of rock were placed. We sourced the heavy density rock from a local quarry in Spain. It was a challenging project given the tight schedule and the fact we had to be finished before the arrival of the rough weather season in the Bay of Biscay.

### NordLink, Germany-Norway

On behalf of cable manufacturer NKT, we performed rock placement works for the 623 km NordLink cable that connects the German and Norwegian electricity markets. Some 516 km is a submarine cable. The campaign was successfully completed by our DP2 fallpipe vessel 'Flintstone' in the summer to a very tight deadline. In 2019, we installed approximately 40,000 tonnes of rock for the crossing protection works.

### North Sea Link (NSL) Interconnector, Norway-The UK

DEME Offshore is working on a two-year rock placement campaign for the North Sea Link (NSL) project, an interconnector between Norway and the UK. On behalf of cable manufacturer Prysmian Group, we started in 2018 and completed the works in November 2019. Passing through Norwegian and British waters, the 730 km long North Sea Link will be operational in 2021 and will be the longest subsea interconnector in the world. Given the many pipeline crossings and areas that cannot be reached by traditional trenching, depth rock protection is necessary. Around 400,000 tonnes of rock have been placed over the years. In 2019, we deployed our DP2 fallpipe vessel 'Flintstone' and performed the works between the summer and November.

### Equinor Norwegian Continental Shelf

We performed several major projects around the Norwegian Continental Shelf on behalf of Equinor. In a joint venture, we secured a long-term agreement with Equinor to provide subsea rock installation works, with the contract officially starting in April 2018. This year we dumped 850,000 tonnes at various projects.

### CPC Corporation gas pipeline, Taiwan

In November, DEME Offshore won a tender to perform rock placement works for CPC Corporation's gas pipeline, off the west coast of Taiwan. The existing pipeline is largely installed in a valley which is subject to landslides. If the area is not stabilised with a carpet of rock, there could be further shifts which could damage the pipeline itself. Very large quantities are required - 150,000 tonnes at two locations - and work got underway in February-March 2020.

We will deploy our DP2 fallpipe vessel 'Seahorse'. Given the volumes that have to be dumped at one location, careful consideration is necessary concerning the speed of the rock dumping, layer thicknesses and the logistics in the loadout port, which is located close to the site.

**NORWAY**  
DP2 fallpipe vessel 'Flintstone' worked several months in Norway for the NordLink and North Sea Link projects



### Baltic Connector, Finland/Estonia

DEME Offshore was the rock and landfall installation contractor for the important infrastructure project, the bi-directional gas pipeline Baltic Connector, which connects the gas networks of Finland and Estonia. Funded by the EU, the Baltic Connector will play a major role in the energy supply of both Finland and Estonia, enabling the countries to have multiple suppliers.

This pipeline has a 20 inch diameter and is 150 km in total and runs from Inkoo, Finland, 70 km across the Gulf of Finland to Paldiski, Estonia. We started preparatory works in May 2018 for the shore approaches and were actually dredging one year in advance due to the limited timeframe we had to complete the activities, given the approaching ice period. Our scope included extensive drilling & blasting work on the Finnish side and dredging in Estonia for the shore approach. We also executed some pre-lay rock placement, representing around 150,000 tonnes.

In March 2019 we returned with a drilling & blasting spread where we tackled the last areas of harder rock. We then cleaned up the trench that we had dredged in 2018 and installed a hydraulically-powered, linear winch to pull the pipeline to shore. We were ready to start pulling the pipeline in May in Finland, and in June we did the same on the Estonian side. We followed this by some

backfilling works and post-lay rock placement. The whole installation was successfully completed in August 2019, which was several months ahead of schedule.

This early delivery was largely possible due to our thorough early preparations the year before. We knew it was difficult to factor in the uncertainty about the weather conditions and that this is vital infrastructure which had to be ready on time.

### Hinkley Point, UK

In the UK, Balfour Beatty has appointed DEME Offshore as a subcontractor for the Hinkley Point nuclear power station shaft construction under an Early Contractor Involvement (ECI) agreement. Our scope included dredging works for six pits required for the construction of the intake and outfall structures of the new nuclear power plant, for which we completed a test pit in October 2018. The actual full installation scope on site is now expected to be executed in 2021 and 2022.

As well as the pit dredging, we have to install a gravel bed. The marine works include the placement of pre-cast concrete structures, large-diameter piling and the construction of shafts and liners connecting the intake and outfall structures with the tunnels which will be bored below. This is a very challenging project because there are many strong currents in the area and

there is a tidal amplitude of 7-8 m, as well as a lot of siltation. The six large concrete structures – four of them weighing over 5,000 tonnes each - have to be placed on the seabed and then a microtunnel has to be drilled from the shore under these giant structures. In the next phase we will deploy a heavy lift vessel to lift the 5,000-tonne structures. Test dredging is due to start in 2020.



**FINLAND/ESTONIA**  
DEME Offshore was the rock and landfall installation contractor for the Baltic Connector project



FINLAND/ESTONIA  
Landfall construction for the Baltic Connector,  
connecting the gas networks of Finland and Estonia

THE NETHERLANDS  
Decommissioning of the Q1  
Halfweg unmanned gas platform



# PLATFORM INSTALLATION AND DECOMMISSIONING

**With our expertise in platform installation and decommissioning services we carried out a milestone project in the North Sea. We successfully performed the decommissioning of the Q1 Halfweg gas platform. It was the second project carried out with our self-propelled DP2 offshore installation vessel 'Apollo', which joined our fleet at the end of 2018.**

## North Sea platform decommissioning

In an important decommissioning project in the Dutch sector of the North Sea and a first for DEME Offshore, we successfully performed the decommissioning of the Q1 Halfweg unmanned gas platform on behalf of Petrogas E&P Netherlands BV in January 2019. This was despite some vicious winter storms with 6 m wave heights. Our offshore installation vessel 'Apollo' fortunately has very long legs, and she jacked up into survival mode until the storms had passed. The scope included the Engineering, Preparations, Removal and Disposal (EPRD) of the 500-tonne topside, as well as the four foundation legs. To ensure the damaged legs were cut safely, the leg cutting operation was done remotely by means of high pressure water jetting. Both the topside, as well as the four legs were transported on the deck of 'Apollo' to the recycling yard.

This project represented a milestone for us as it was the first EPRD contract we have undertaken for the removal of a full platform entirely on our own. We also had to manage and supervise the disposal and recycling process to ensure the work was done safely and in an environmentally correct manner. We offloaded the platform at a disposal yard in Vlissingen, the Netherlands. Ultimately, an impressive 98% will be recycled.

The Q1 Halfweg platform was a three-well, unmanned gas production facility which was installed in 1995. The platform had been damaged following a collision with a chemical tanker. We took a very proactive approach when tendering and suggested a jack-up rather than a floating solution for its removal.

## Decommissioning of 11 platforms in the Southern North Sea

In partnership with AF Offshore Decom AS (AFOD) we have secured a contract for the removal of 7 + 4 Southern North Sea platforms from the UK sector. The platforms are currently being prepared by AFOD for removal and the engineering works are ongoing for the removal of up to 11 platforms scheduled to be executed between 2021 – 2024. We are responsible for the marine engineering and the removal and transportation of all 11 platforms. Engineering work continued throughout the year for the removal operations, offshore works could commence from 2020. 🌱

# SCALDIS

Scaldis is a highly experienced offshore heavy lift contractor and provides services for the oil & gas, renewables, decommissioning, civil and salvage markets.

Scaldis is specialised in the transportation and installation of offshore structures and the decommissioning of offshore facilities. We have earned a reputation as a solid and reliable partner and provide turnkey and cost-effective solutions in close cooperation with our customers.

## BELGIUM

### Substation installed on DP2 at the Northwester II project in Belgium

In a remarkable project, 'Gulliver' installed her first offshore transformer station on DP2 in record time, setting a new milestone for the company. We were able to carry out the positioning very accurately with the powerful DP2 system installed on our heavy lift vessel. The DP was vital because we were not allowed to deploy our anchors due to the infield cables.

The substation transportation barge was moored to the 'Gulliver' and the Dyneema slings connected to the topside. Once the topside was lifted, 'Gulliver' sailed on DP to the foundation and carefully started positioning herself before finally lowering the topside into position. The four-deck substation had to be installed on a monopile foundation.

## GERMANY

### OSS Albatros topside

In March 2019, we also lifted the OSS Albatros topside. This was related to the development of the Hohe See and Albatros Offshore Wind Farms. Scaldis was tasked with the transfer of the topside from a cargo barge to the jack-up vessel deployed for the offshore installation.

## NORWAY

### Refloating and salvage of 'Helge Ingstad' frigate in Bergen

In November 2018, the 'Helge Ingstad' frigate collided with the tanker 'Sola TS' near Bergen and sank on an inclined slope of a fjord. The Norwegian Navy called on the expertise of Scaldis and BOA Offshore to salvage the shipwreck. The salvage operation turned out to be the biggest one in Europe in 2019 and given this exceptional event, the whole project was livestreamed, so the eyes of the world were upon us. Scaldis developed a revolutionary lift method especially for this project by combining its two heavy lift vessels 'Rambiz' and 'Gulliver'.

Our pioneering lifting method enabled us to fully utilise the strength of 'Rambiz', which is equipped with two cranes with a total lifting capacity of 3,300 tonnes, and our new self-propelled DP2 vessel HLV 'Gulliver', which also has two cranes but a lifting capacity of 4,000 tonnes. Ultimately, this double duo lift gave us a combined total lifting capacity of 7,300 tonnes. It made it possible to lift the 133-metre long and 5,500-tonne frigate in one piece.

Missiles, ammunition and fuel were removed from the frigate during the winter months, while we, in combination with diving experts, installed 16 hoisting chains under the wreck to lift the vessel. The rigging and the chains alone weighed more than 250 tonnes. To perform the lift safely it was transported while hanging from the crane hooks of the heavy lift vessels to the nearest sheltered location.

The frigate was then placed on a submersible pontoon which was subsequently deballasted, allowing it to re-emerge above the waterline whilst supporting the frigate. During this operation, the hoisting cranes stabilised the ship until all 400 separate enclosed rooms had been de-ballasted and the seafastenings were secured for subsequent transport.

A fast-track salvage project as big and complex as this one highlights the essence of our expertise and the great team work with BOA and the Norwegian Navy.

### Salvage of Russian fishing trawler

We started and ended the year in the white snow of Norway. To finish the year we sailed to Tromsø, Norway's northernmost ice-free port for the salvage of a Russian fishing trawler that had caught fire and sunk. We lifted and parbuckled the 65-metre long, 1,700-tonne fishing vessel.

## UK

### Decommissioning the first two of 17 platforms in the Vulcan & Viking and Viking Bravo fields

Scaldis performed the engineering, offshore preparatory work, removal, dismantling and transportation of the Viking KD and LD platforms. These remote well-head platforms were installed in 1998. This campaign is part of a total of 17 platforms in the UK sector, which need to be removed by our joint venture.

After years of preparation we removed two in 2019 and six will follow in 2020 as part of the scope of our abilities. This project highlighted the work of our efficient and very experienced team and the suitability of 'Gulliver' for dismantling/decommissioning works. Here we transported the jacket and topside in the hooks.

Given the design of the topsides, it was almost impossible to seafasten them on a barge, so we developed a workable and competitive solution together with our customer. We sailed four times from the offshore field to the dismantling yard.

### Removal of the subsea wellhead structures Orwell, Thurne and Wissey

Scaldis was contracted by Tullow Oil SK Limited to remove and dispose of the Thames Decommissioning Phase 4 subsea structures. Located in a water depth of 35 m, the structures were removed by Gulliver's main cranes and a crawler crane. In addition, four conductors and a template were removed. The structures were secured and seafastened on deck of the 'Gulliver' and transported to the disposal yard in Great Yarmouth. Due to extensive preparation works, everything could be handled in a single trip. 🌍



UK  
Scaldis' heavy lift vessels are ideal for dismantling and decommissioning works



NORWAY - BERGEN  
Scaldis developed a revolutionary lift method by combining its two heavy lift vessels for the salvage of the Norwegian frigate 'Helge Ingstad'





## ENVIRONMENTAL

**Our environmental specialists take a proactive role in sourcing and developing potential remediation projects, alongside their development partners.**

We offer innovative solutions for soil remediation and brownfield redevelopment, environmental dredging, sediment and water treatment. We are also leveraging our expertise to develop solutions to tackle the plastic waste that is polluting the world's rivers and oceans. A test project got underway to assess the effectiveness of a new technology to catch plastics from our rivers before they reach our oceans.





# SOIL REMEDIATION AND BROWNFIELD DEVELOPMENT

## BELGIUM

### Blue Gate - Antwerp

Blue Gate Antwerp is a 66 ha blackfield site which is being transformed into a sustainable business park. Located in Antwerp's old petroleum harbour, the redevelopment is being undertaken in three phases, which will run until the end of 2036. The Blue Gate Antwerp project was awarded to the Blue O'pen Consortium in 2016, comprised of DEME and sustainability specialist BOPRO.



**BELGIUM - ANTWERP**  
Six hectares of remediated land has already been sold to new companies, all with a focus on sustainable business activities

We have successfully finished the first phase of this massive remediation and infrastructure project on schedule and it is ready for redevelopment. Six hectares have already been sold to new companies, all with a focus on sustainable business activities.

We elevated almost 600,000 m<sup>3</sup> of terrain, remediated 100,000 tonnes of soils which were polluted with mineral oils, PAHs and heavy metals, and we have moved some 200,000 tonnes, as the more lightly polluted soils could stay on the site once they had been mapped and reported.

The Blue O'pen Consortium has also been awarded the contract for the second phase of the development, which started in May 2019. Our scope includes soil remediation, raising the terrain and infrastructure works. Currently, we expect to clean 90,000 tonnes of soil and to use around 350,000 tonnes to raise the site. Eventually a 17 ha business park will be established when this phase of the project concludes at the end of 2022.

#### Ford site - Genk

As a member of the consortium Genk Green Logistics, we won a public tender in 2017 to remediate a part (40 ha) of the

former Ford site in Genk, which is situated alongside the Albert Canal. In the final quarter of 2018, we also won the tender to perform demolition and soil remediation works on a further 70 ha at the site in a joint venture. Both sites were fully remediated at the close of 2019. Some 120,000 tonnes of soil were cleaned by physico-chemical soil washing in our soil recycling centre GRC Zolder, which is also located along the Albert Canal. The site will now be operated by Genk Green Logistics, which will establish one of the largest logistics hubs in the region.



**BELGIUM - ANTWERP**  
We successfully finished the first phase of the Blue Gate remediation and infrastructure works

### Eastman (formerly Taminco) site - Ghent

During 2019, we were very busy remediating a historic dump site at the Eastman Chemical premises in Ghent. All the different types of waste - including hazardous, wood, plastics and anorganic - were sorted out and recycled as much as possible. If this was not practicable, they were immobilised and transported to certified dumping sites. A total of 180,000 tonnes were remediated and work wrapped up in November 2019.

### Zonneberg Terranova - Ghent

Together with our joint venture partner, DEC acquired the previous dredging disposal site "Callemansputte", which is adjacent to the former gypsum dump site of Nilefos in the Port of Ghent, in October. We fully remediated the gypsum dump in 2018 and the new 15 MW "Zonneberg" solar farm has been established there, producing green energy for 4,000 households.

We will remediate the 22 ha Callemansputte site and turn it into a nature park, including several lakes and bird-watching hides. As this site is around 5 m high and

the Terranova one approximately 55 m, the whole site will be landscaped into one. This project will run for 11 years.

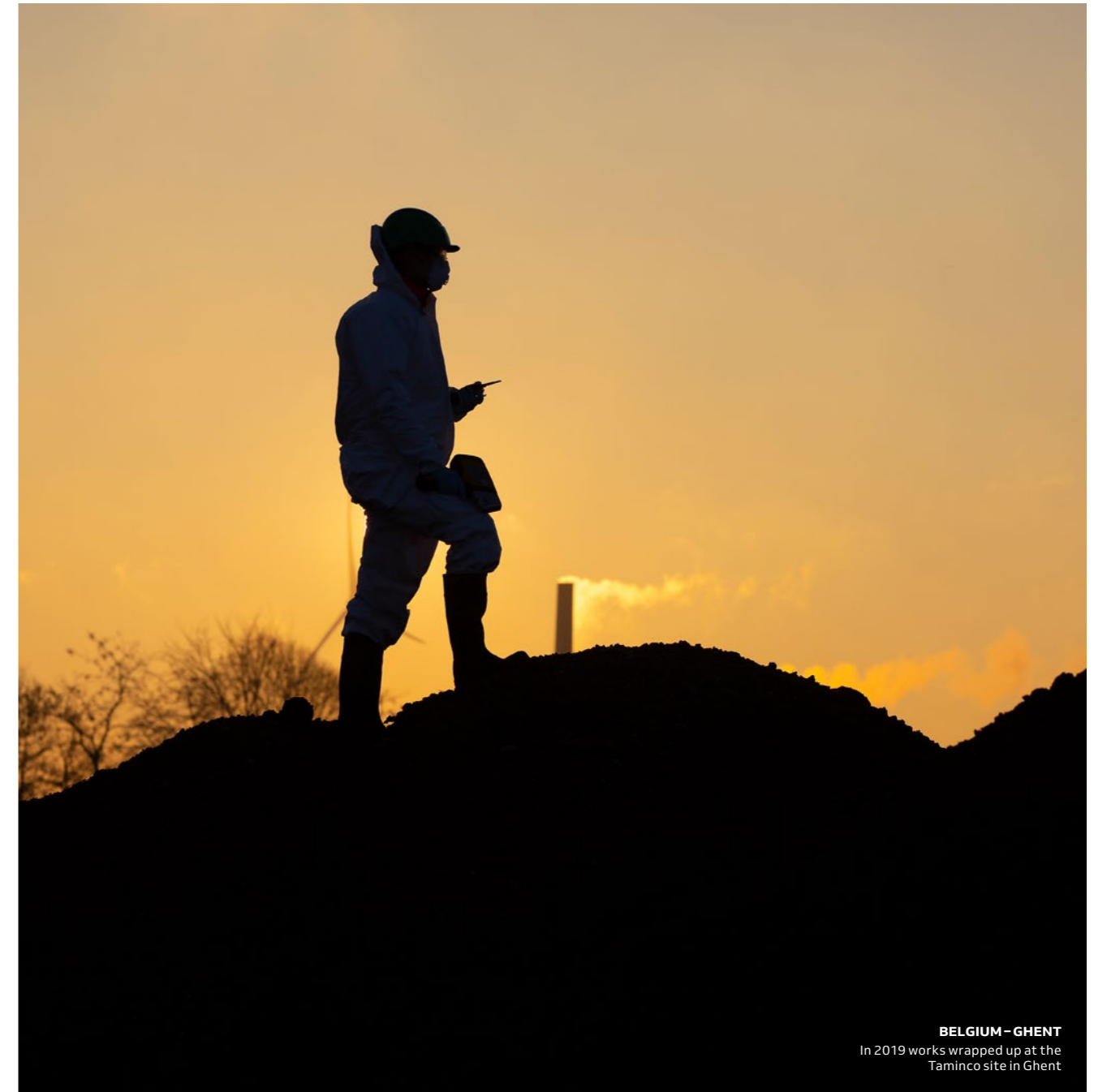
### New Docks - Ghent

The second phase of the prestigious 'New Docks' project (2 ha) in the centre of Ghent was successfully completed at the end of the year. A total of 15,000 tonnes of contaminated soil were excavated and treated in 2019.

We finished the first phase in 2018 and the new houses on the site are already being made into homes. The former docks were bought by project developers



**BELGIUM - ZELZATE**  
A 15 MW solar farm has been established on remediated land, producing green energy for 4,000 households



**BELGIUM - GHENT**  
In 2019 works wrapped up at the Taminco site in Ghent

and we worked in partnership with them to remediate the ground to the highest environmental standards. Eventually the former industrial site will be transformed into a new neighbourhood in the city with 1,500 homes, businesses and recreational areas.

**BP - Hoboken**

After a long tendering process, in which DEC participated with a project developer, BP sold its former Hoboken lubricants production plant to the project developer and granted the contract for the remediation works to DEC. After

its remediation, we will work together to transform the site into a “Maritime Cluster Antwerp”. Our scope includes the demolition of old tanks, soil remediation and the treatment of 50,000 tonnes of contaminated soil. Preparations have kicked off, with onsite work expected to start in April 2020.

**Fort Sint-Filips - Antwerp**

On behalf of the Port of Antwerp, a consortium including DEC started working on the large-scale and complex remediation of the historically polluted Fort Sint-Filips in Antwerp in October 2019.

Located on the right bank of the Scheldt River the old fort served as a dumping and incineration site for waste products between 1950 and 1970, particularly from the petrochemical industry. Works at the heavily contaminated site will take almost two years.

Nowadays the fort and the surrounding canals, an area of 31 ha, are buried under a layer of sand. The waste products will be removed, after which the dump will be filled and capped. The top layer will consist of film and clay mats, while an impermeable cement-bentonite wall will be built around the fort. Contaminated soil in the remainder

of the area will be excavated and removed. We will also clean up the buffer pond and embankments, with contaminated sludge being removed and parts being capped. We also have to take the piping from the surrounding chemical plants that run through the site into account, to ensure drainage is maintained.

The banks of the fort are part of the Sigma Plan that should provide better protection from high water levels for the areas around the Scheldt and its tributaries. Therefore, the height of the dykes is being increased and a new groyne area is also being constructed as a tidal nature reserve.

**Codami - Manage**

Depollution works at the Codami site in Manage were completed in October 2019. Nearly 100,000 tonnes of polluted soils were handled using off-site techniques.

**Nearly 100,000 tonnes of polluted soils were handled.**

**Tertre**

At Tertre, we continued the remodelling and capping of a large, heavily polluted industrial site, using confinement techniques. Approximately 100,000 tonnes of polluted soils were managed during the year. Due to added work, the Tertre project is expected to be finished at the end of 2020.



**NORWAY – TØNSBERG – VALLØY**  
A four-year project to remediate a former refinery site located near Tønsberg successfully concluded at the end of 2019



**THE NETHERLANDS – TERNEUZEN**  
The New Lock Terneuzen project also included soil remediation works

**ITALY**

**Bussi**

DEC has been awarded a tender from the Italian Ministry of the Environment to remediate two former landfill sites from a disused chemical factory in Bussi. Located on the river Tirino in Abruzzo, Bussi is one of the oldest industrial clusters in Italy. In 2020 we will carry out a study examining the types of contaminated materials present on the site and the volumes. Operations are expected to get underway in 2021. Between 400,000 - 500,000 tonnes are likely to be handled.

**NORWAY**

**Tønsberg – Valløy**

A four-year project to remediate a former refinery site located near Tønsberg successfully concluded at the end of 2019 and on schedule, even though the expected volumes to be remediated almost doubled.

This challenging project highlights the close cooperation required between us, Exxon-Mobil and the Norwegian Environment Agency. Very strict environmental regulations were in place, for example all of the excavated acid tar had to be turned into good quality, usable

secondary fuel and we also had to ship 50% of the treated soil by water. The site will ultimately be used for commercial and residential purposes.

As the facility had been subjected to bombing raids in the Second World War, the strictest safety measures were in place to check for the presence of UXO. At the final count, we discovered several UXOs, including intact bombs of up to 1,000 lbs, as well as several landmines. Each bomb and mine had to be detonated by the Norwegian Army. We built protective layers around the bombs to limit their impact when they were detonated.

**THE NETHERLANDS**

**New Lock Terneuzen – Schependijk**

We performed remediation and reclamation works at the New Lock Terneuzen megaproject in the Netherlands.

These were completed in the first quarter of 2019 and ultimately some 25,000 m<sup>3</sup> of polluted material was removed from the 'Schependijk'. This was then transported to one of our soil and sediment treatment centres, cleaned and given a new life at the Milieupark Oost project mentioned in this section. We are very pleased to see fully

remediated, historically polluted material becoming part of a new nature reserve.

**Milieupark Oost**

Milieupark Oost is a public-private partnership between us and the Council of Den Helder. Work was ongoing during 2019. A former dumping area known as 'Insteekhaven' was completely filled in so the area could be covered over. To realise these works a special solar power shield was deployed. One of the two remediation areas of Milieupark Oost was closed and this area was handed over to its owner in a specific shape so solar power can be developed there.

We have also secured a long-term contract for the remaining remediation area, which is set to be used to treat onshore and offshore waste, such as cuttings and mud from gas and oil drilling exploration.

# ENVIRONMENTAL DREDGING AND SEDIMENT TREATMENT



**ITALY - TARANTO**  
We deployed an in-house developed soil wash installation at the ILVA steel plant project in Taranto

## BELGIUM

### Nyrstar, Balen

In Balen, we are performing ongoing works involving the dehydration of Nyrstar's process residue. We are carrying out the tailing management and dewatering, as well as making filter cakes from the material for the mining and metals company.

### Flemish Inland Waterways

We are working for De Vlaamse Waterweg (the Flemish inland waterway authority) as part of a seven-year contract, treating the dredged sediments at its centres throughout Belgium.

### Walloon waterways

Under a four-year framework contract, we dredged approximately 100,000 m<sup>3</sup> of potentially contaminated sediments from the Walloon waterways. All the sediments were dredged by our equipment and transported by our own barges. The material was discharged into treatment centres using high-density pumps.

### AMORAS, Antwerp, Belgium

As part of a consortium we have been awarded a 15-year contract for the AMORAS facilities in Antwerp. This is a major design, construction and operation contract for sediment treatment and storage in the Port of Antwerp.

## FRANCE

### Condé

Our subsidiary Ecoterres is performing works, together with a joint venture partner, which will eventually lead to the reopening of a 6 km section of a canal between the Belgian border and the city of Condé in Northern France.

In 2019, three large dedicated landfills, which will be used to store contaminated sediments dredged from the canal, were under construction. We have been busy layering HDPE liners in the landfill sites, which will eventually be a total approximately 36 ha. A staggering 360,000 m<sup>2</sup> of liners will have been placed when the trio of deposit sites are completed in 2020. Following their construction, we will start dredging the canal in 2020 for a period of two years. This represents 1.5 million m<sup>3</sup> of polluted sediments and is one of the biggest dredging projects in France.

Unloading the sediment is particularly challenging, taking into account its characteristics (heterogeneous material, 'pumpability' characteristics and presence of coarse material). We will have to unload the material from barges to the disposal sites using crane pontoons and barges.

To meet this challenge we intend to design and build a dedicated unloading system in-house, which will provide us with high productivity levels and a speedy flow rate to handle 6-700,000 m<sup>3</sup> a year.

Additionally, we are developing a pioneering new vessel especially for this project. The new autonomous (unmanned) pushboat will push barges through the canal and will be piloted remotely from a 'control tower'. The new vessel is expected to be operational in Q4 2020.

### Dunkerque

In another framework contract, which highlights how we aim to develop long-term relationships with our clients, we continued performing maintenance dredging in Dunkerque with our joint venture partner and sister company SDI. This includes our management of the sediments at a local centre within the port.

## ITALY

### Taranto

DEC finalised a major project to dredge three channels and to dewater the dredged material using an in-house designed, soil wash installation at ILVA's steel plant in Taranto. We achieved high production rates of 500-600 m<sup>3</sup> in situ per day. This is the first time that a solution where the dredge unit is directly 'in line' with the washed-watering facility has been deployed. The project completed in June 2019, and we treated a total of 60,000 m<sup>3</sup>.



**FRANCE – CONDE**  
Three large dedicated landfills, which will be used to store contaminated sediments dredged from the canal, were under construction

**Treatment centres in Belgium, the Netherlands and France**

With several soil and sediment recycling centres in Belgium, the Netherlands and France, our environment specialists treated 1.22 million tonnes of polluted soil and dredged sediments in 2019, making DEMA a leading company in this specialised activity.

During 2019 our soil and sediment treatment centres were very busy and we are also aiming to establish two new centres in northern France. Like our other centres, the two new locations are alongside waterways and we encourage companies to carry out the transport of polluted and treated soils/sediments by water wherever possible. A record 295,000 tonnes of polluted soils, sediments and sludges were treated in our centres in Wallonia. Additionally, 32,500 tonnes of polluted soils, sediments and sludges were managed but treated in external centres.

We have around 30 mobile and fixed water treatment plants



# WATER TREATMENT

Purazur is our subsidiary specialising in water treatment solutions. As well as performing design and build contracts, we have around 30 mobile and fixed water treatment plants. In addition to our traditional focus on industrial wastewater, we also moved into the process water side of the industry in 2019, whether this is drinking water, demineralised water, ultra-pure water, cooling water or other forms.

## Belgoprocess, Dessel

A contract to design and build a new water treatment plant for radioactive wastewater containing nitrogen on behalf of NIRAS/Belgoprocess in Dessel moved into the onsite assembly stage in November 2019. The project involves both the biological purification of the wastewater and the separation and dewatering of the produced bio-sludge.

This is a challenging project for two reasons: there is limited space and because the site is in a highly controlled zone. This meant that we had to devise a compact design based on skids to limit the onsite installation time as much as possible.

During the year we constructed the new plant at our workshop and performed rigorous tests. We wanted to ensure that everything was working perfectly before construction started in the controlled zone. Commissioning is expected to take place in January 2020.

In a second project for Belgoprocess – and one outside of the controlled zone – we designed and built a unit to handle three wastewater streams, which have to be pumped across the site. The project was completed in June 2019.

## Two pilot projects

We are conducting a three-month pilot test for our sister company Ekosto for an ultrafiltration and reverse osmosis facility. Although a water treatment plant is already in place, this additional installation made sure the effluent quality was in line with the required standards and a full-scale installation has now been proposed.

In a four-month pilot project in Lommel, Belgium, we carried out sampling, lab testing and pilot testing on site for a design and build contract for a facility to process contaminated surface water which has been polluted with zinc and cadmium.

## Operations & Maintenance activities

In a new contract, we will deliver Operations & Maintenance services to a pharmaceutical company in Belgium from January 2020. Our operators will carry out the daily supervision of the water treatment installation, do inspections, sampling, laboratory tests, as well as the calibration and cleaning of instrumentation, amongst other tasks. 🔄

Wherever we work, our people often unfortunately face the same issue: the modern-day scourge of pollution on beaches and in our oceans



# PLASTIC SOUP SOLUTIONS

Wherever we work, whether performing offshore turbine installation, dredging, or building a quay wall, our people often unfortunately face the same issue – the modern-day scourge of plastic pollution.

In order to tackle this problem we launched a new business unit, Plastic Soup Solutions. To play a role in cleaning up our environment we have decided to tackle the plastic problem at the source. As we all know, there is growing awareness about plastics in the oceans, but how does it get into the ocean in the first place? Via the rivers. It is estimated that just 10 rivers lead to the huge plastics problem in the oceans.

So we decided to do something about it by focusing on rivers and ports. To make a start, we are initially tackling macro-plastics because these are easier to capture and we wanted to act now and do something tangible. We are also working in close cooperation with several Belgian universities.

## Tackling plastics at the source

This initiative to tackle plastic pollution originally came from an innovation call within the company where several of our high potentials attending our disruptive technology event suggested that DEME could play an important role. But later in 2018 we were approached by the Flemish waterways authority and asked if we could develop an innovative solution to catch floating litter in rivers, partly to reduce damage claims from inland shippers, who sometimes experienced plastics or tree branches getting tangled in their propellers. In 2019, we have been busy with the design and engineering phase of an innovative plastic catcher, and from February 2020 onwards this will be operational on the Scheldt River, near the bridge of Temse.

## Artificial Intelligence, Virtual Reality and Autonomous Sailing

This catcher is using state-of-the-art technology, combining Artificial Intelligence (AI) for object recognition, Autonomous Sailing and Virtual Reality (VR).

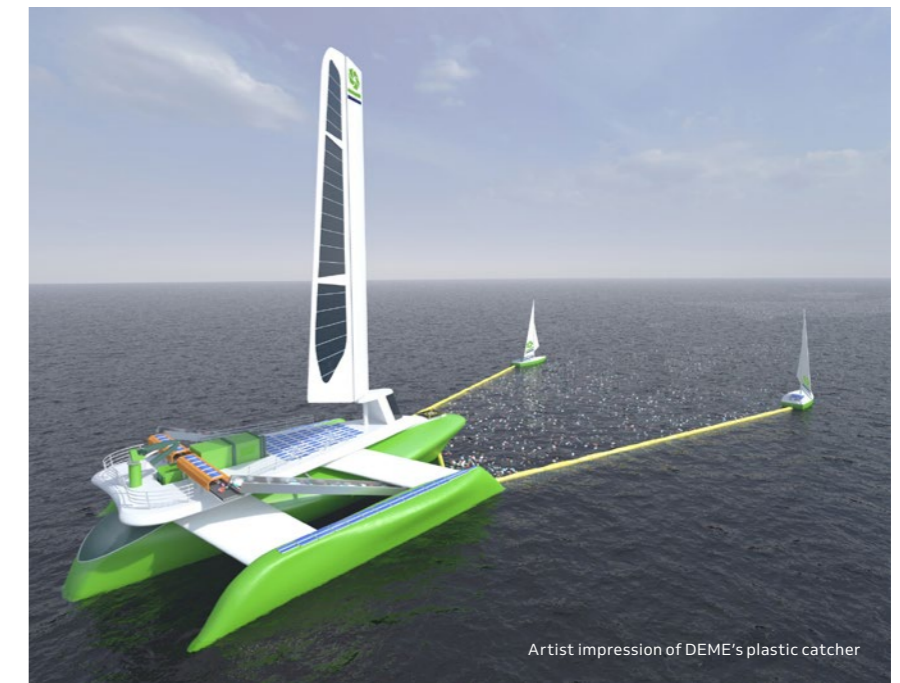
We chose this bridge location because it has the largest tidal difference of 7.5 m between high and low tide and strong currents, so we felt it would be the optimal place to test our technology.

Installation of the catcher, a 200 m wide 'funnel', started in December 2019 and then it will be tested and monitored for a year. Cameras deploying AI are placed on the bridge checking for debris. Once they spot an item, they focus on it and follow it.

Current, wind and environmental data are processed, which enables the system to predict where the object will go.

The unmanned, autonomous vessel gets the message that an object is there and if the object will end up in the shipping channel, it will be intercepted by the vessel and pushed towards the funnel. Once the catcher is full, an operator puts on a virtual reality headset and empties the funnel into a container on the vessel. The vessel stays by the funnel and then takes the container to unload at the quayside.

In this first phase we will focus on floating, macro-plastics, but as we know that this is only the tip of the iceberg, we are also busy looking into technologies to tackle the plastics below the waterline.



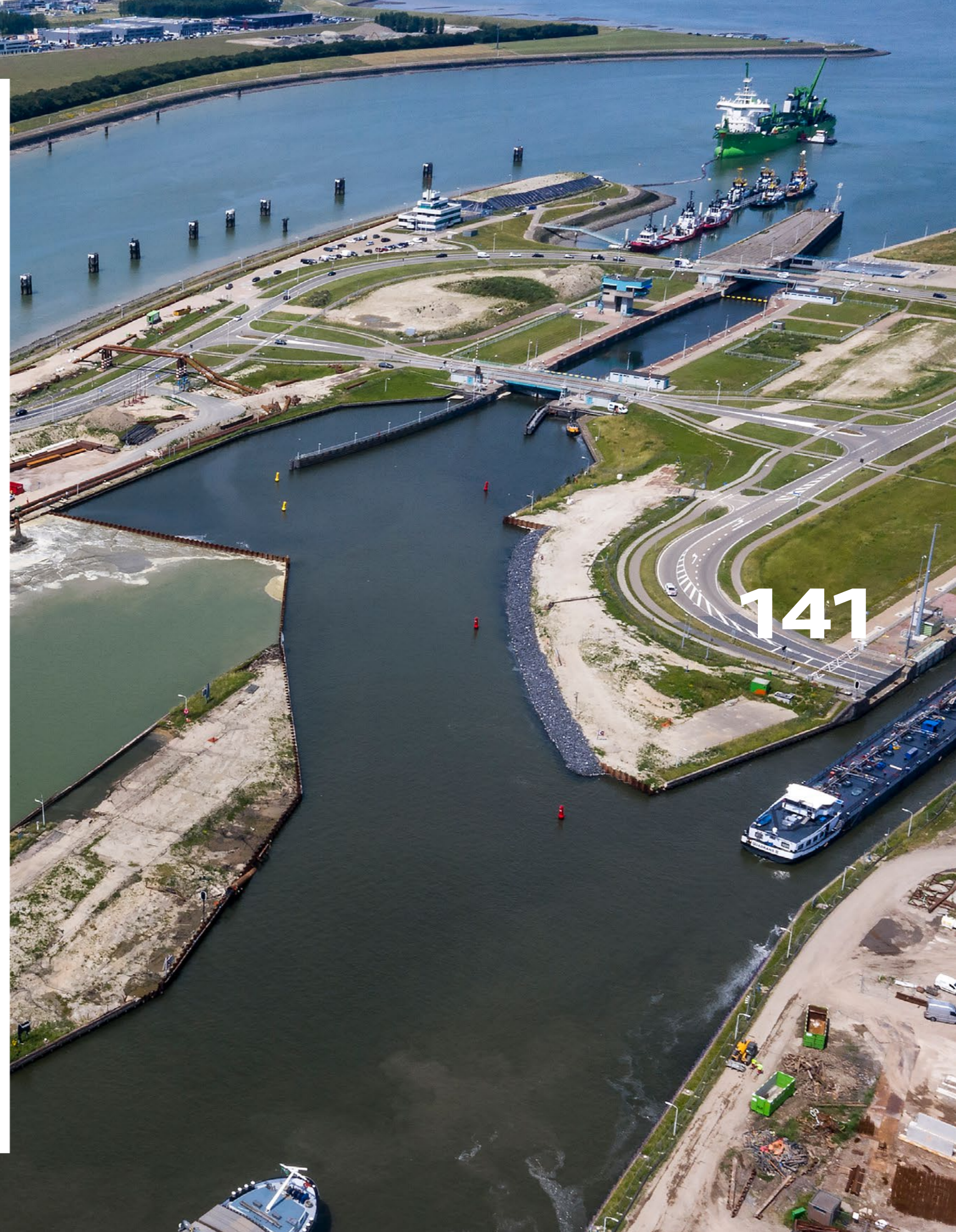
Artist impression of DEME's plastic catcher



# INFRA

**DIMCO is our subsidiary which specialises in marine infrastructure and civil works that complement and reinforce the company's dredging activities.**

These include the design and construction of hydraulic works such as jetties, port terminals, locks and weirs, infrastructural works such as bored, immersed and cut and cover tunnels, foundation and marine works for bridges or other constructions in a marine or fluvial environment, and civil works for harbour construction, dams and sea defences, canal construction, revetment, quay wall construction and shore protection.

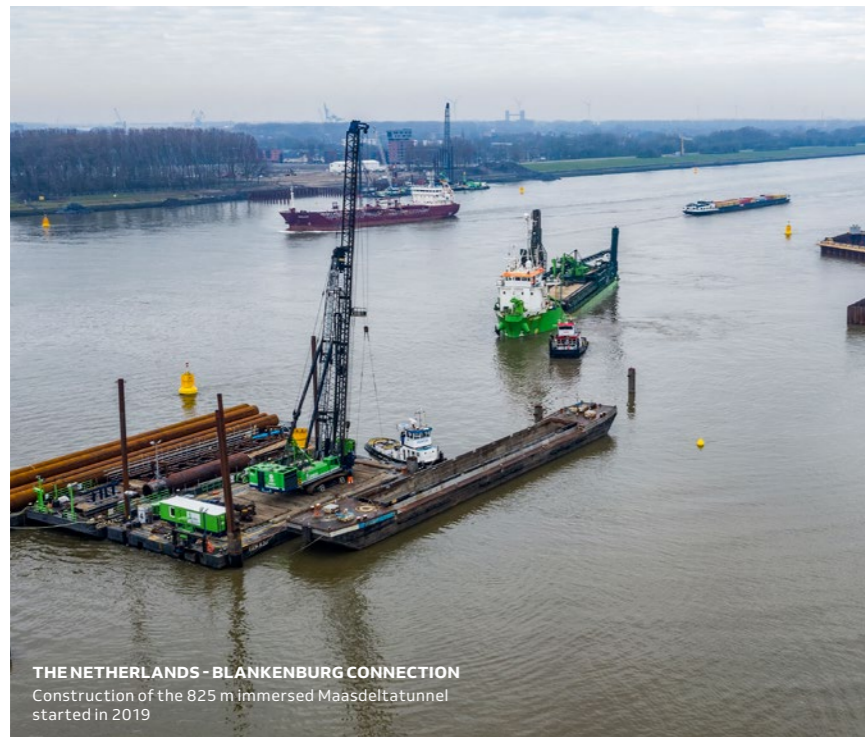




2019 was dominated by three prestigious megaprojects in the Netherlands: the RijnlandRoute, Blankenburg Connection and New Lock Terneuzen. These huge projects highlight how our core activity lines support, reinforce and generate works for each other. This combined strength ensures the success of these complex projects.



THE NETHERLANDS - BLANKENBURG CONNECTION  
Piling works for the immersed tunnel



THE NETHERLANDS - BLANKENBURG CONNECTION  
Construction of the 825 m immersed Maasdeltatunnel started in 2019

## Blankenburg Connection

The A24 'Blankenburg Connection' connects the A20 and the A15 and improves access to the Rotterdam region. The scope includes the construction of a highway with 2x3 lanes, a land tunnel, immersed tunnel, a deepened connection to the A20 road and a high connection to the A15. Additionally, the A20 will be widened.

Rijkswaterstaat (part of the Dutch Ministry of Infrastructure and Water Management and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands) awarded the EUR 1 billion, public-private partnership project 'A24 Blankenburg Connection' to the BAAK Consortium, which comprises DEME Concessions, Ballast Nedam Concessies and Macquarie Capital. The project was awarded on a design, build, finance and maintenance basis and will run for a period of 20 years.

Together with Ballast Nedam Infra we finalised the basic design and commenced the construction of the 825 m immersed tunnel (the Maasdeltatunnel). The cofferdams of the Maasdeltatunnel in both the north and south have been completed and the combi-walls of the tunnel approaches and ramps are nearing completion. Dry earthmoving works are progressing on schedule.

Dredging and backfilling volumes represent approximately 1 million m<sup>3</sup> and dry earthmoving works around 2 million m<sup>3</sup>. Dredging works will start in early 2021. Our subsidiary de Vries & van de Wiel carried out the initial sand supply during 2019, which represented volumes of around 350,000 m<sup>3</sup> and this supply will continue in the years to come.

Works are expected to be completed on the project by the end of 2025.

## New Lock Terneuzen

The New Lock Terneuzen is progressing right on schedule. A Dutch-Belgian joint venture Sassevaart, comprised of DIMCO, Dredging International and the construction companies BAM Contractors, BAM Infra Nederland and Van Laere, was awarded a design and construct contract for the new lock, as well as the maintenance contract for a period of two years.

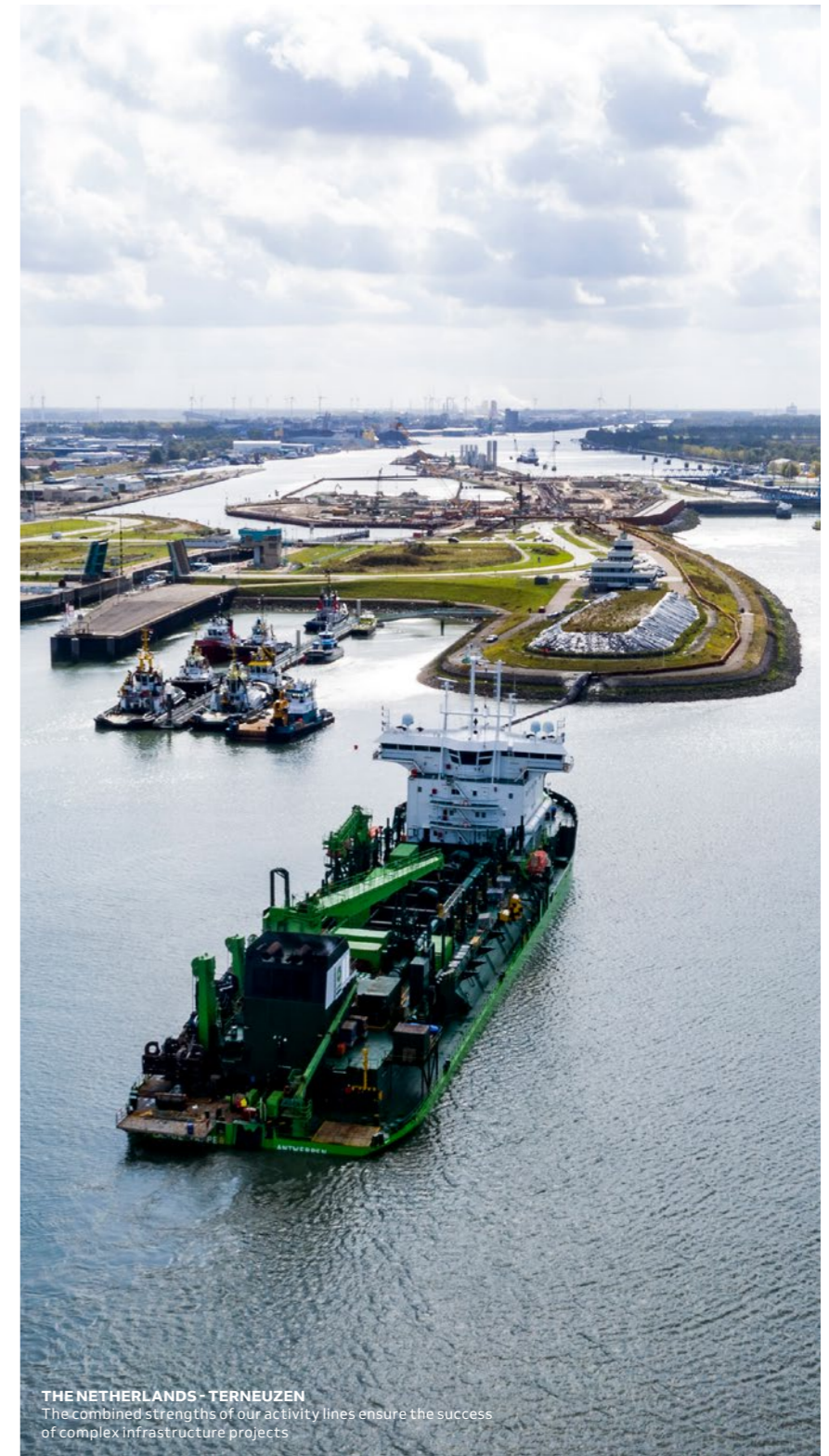
At 427 m long, 55 m wide and 16.44 m deep, the new lock is being constructed in the middle of the existing Terneuzen locks' complex, between the West and East locks. It is designed to provide better access to the ports of Ghent and Terneuzen, and to promote a faster flow of shipping between the Netherlands, Belgium and France.

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**In 2019, DIMCO achieved several major milestones on the New Lock Terneuzen project.**  
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In 2019, DIMCO achieved several major milestones on the New Lock Terneuzen project. The design was finalised and crucially on May 6 we completed the so-called Kapitein Rooibos canal. Representing the shortest canal in the Netherlands, it is approximately 200 m long and 50 m wide. This 'bypass canal' is an innovative concept we developed for the tender. The new canal enables the middle lock to remain in operation for one year longer than originally planned. This smart solution minimises the impact of the works and was certainly one of the main reasons we were awarded the contract for the new lock.

In addition, we have started the construction of the four lock gates, which are 58 m high and weigh around 1,600 tonnes each, in plenty of time before they are shipped in July 2021. Furthermore, two lock bridges of 83.3 m are under construction. We have also finalised the combi-walls and diaphragm walls for forming the future lock chamber.

DEME Building Materials is supplying the gravel and sand for making concrete on the site and de Vries & van de Wiel performed



THE NETHERLANDS - TERNEUZEN  
The combined strengths of our activity lines ensure the success of complex infrastructure projects

remediation and reclamation works under Phases 1 and 2 of the project. These were completed in the first quarter and finally some 25,000 m<sup>3</sup> of polluted material was removed from the 'Schependijk'.

The first ship is expected to sail through the New Lock Terneuzen by March 2023.

## River Lek - Renovation Stuw Ensemble

Together with two Dutch partners, we continued upgrading the lock and weir complex on the River Lek. The weirs were originally developed between 1960 and 1970. Works continued throughout 2019.



**THE NETHERLANDS - TERNEUZEN**  
At 427 m long, 55 m wide and 16.44 m deep, the new lock is being constructed in the middle of the existing Terneuzen locks complex

## RijnlandRoute

As a member of the COMOL5 joint venture, we were awarded a design in 2017, build and 15-year maintenance contract for the RijnlandRoute, which is a new road connection from Katwijk, via the A44, to the A4 at Leiden in the Netherlands.

COMOL5 (DIMCO, Mobilis, Croon-wolter&dros and VINCI Construction Grands Projets) is responsible for the reconstruction of the Leiden West motorway junction and the construction of the 4 km N434 road, including a 2.2 km bored tunnel.

With the design finalised and all the permits in place in early 2019, preparations began on the start shaft where the massive tunnel bore machine (TBM), which is 100 metres long and 11 metres high, would begin its work. The giant machine arrived in April 2019 and was assembled by early August and tunnelling began on the twin tube tunnel. As the tunnelling began, we carried out the related dry earthmoving activities and the removal of sludge and mud from the tunnel, which represents approximately 500,000 m<sup>3</sup>. This is being transported to three dumping pits situated next to the project.

Towards the end of the year, we were close to finishing the first tube of the tunnel, which is no mean feat given that the machine drills 24/7 and has to travel a distance of 2.25 km. It will then surface in a specially developed arrival pit. On arrival, which is expected to take place in January 2020, the bore machine will be dismantled and taken over the road back to the starting pit and will be re-assembled to start the second tube. Once the tunnelling starts again it is expected to take six months to complete the second tube.

## The tunnel boring machine started its underground journey in August 2019.

A crucial part of keeping the project on track concerns the early fabrication of the Tunnel Technical Installations (TTI), which are being built in Eindhoven. These are tailor-made, containerised units, which are already connected with the traffic centre in Rhooen. The 25 modular units of 3 x 3 x 9 m include cameras, lights and signs, etc. which

would normally have to be installed in the tunnel. Building them offsite and testing them in advance saves a lot of time and there are fewer interfaces and ultimately this 'plug & play' approach helps de-risk the project. Once the customer has approved them they are transported by container to the site and connected to each other.

The sand supply for this huge project was also completed in 2019. Eventually this represented more than 2,000 ship movements and a total of 1.1 million m<sup>3</sup> was delivered by de Vries & van de Wiel.

As well as the tunnelling, we have been performing various road improvement works to existing roads and the construction of the new flyovers and viaducts is also on schedule. Eventually, we have to relocate the motorways underneath the flyovers over two weekends in October 2020. ♻️



## NAMING CEREMONY TUNNEL BORING MACHINE

In early 2019, the finishing touches were made to the tunnel bore machine that will the tunnel for the RijnlandRoute. The impressive 100 metres long and 11 metres high 'mobile factory' is being developed at the Herrenknecht factory in Schwanau, Germany.

In a name-giving competition held at local schools, the giant tunnel bore machine was named Gaia, after the Mother Earth goddess. The naming of the tunnel boring machine and the accompanying blessing ceremony was attended by officials and tunnel workers in July 2019. Such inaugurations are traditionally held in order to assure good luck for the project ahead.

**THE NETHERLANDS - RIJNLANDROUTE**  
The tunnel boring machine started its underground journey in August 2019



**DEME  
CONCESSIONS  
& GSR**

**149**



# DEME CONCESSIONS

DEME Concessions brings together all of our concessions in the fields of infrastructure (dredging and marine infrastructure), renewables (wind, wave and tidal), ports and marine resources. DEME Concessions provides equity, project finance and specific knowledge to support the various activities of our Group.



## RENEWABLES

### Merkur

The 396 MW Merkur Offshore Wind Farm in Germany, in which we held a 12.5% share, became fully operational in August. In line with our investment regeneration policy, we decided to sell our stake, and the transaction was signed in early December. Closing is expected in spring 2020 following EU merger clearance.



### Rentel

The 309 MW Rentel Offshore Wind Farm, located in the Belgian North Sea, was fully commissioned in March and is putting in a strong performance in line with expectations. The project was developed by Rentel NV, a consortium of eight Belgian shareholders, including DEME, Otary and Elicio NV, and represents a total investment of EUR 1.1 billion. Additionally, the consortium sold the 85 km export cable so it became part of Elia's Modular Offshore Grid, which will combine electricity generated by the Rentel, Northwester 2 and SeaMade Offshore Wind Farms.

### SeaMade

DEME holds a participation in the concessions for the Seastar (246 MW) and Mermaid (266 MW) Offshore Wind Farms in Belgium which have been merged into the 'SeaMade' project. SeaMade NV is responsible for the simultaneous development of both Mermaid and Seastar, resulting in the single largest wind farm financed and built in Belgium. SeaMade is expected to be operational in 2020.



### Wave and Tidal

We acquired a minority interest in the Scottish development company Tidal Power Scotland Limited (TPSL), which controls the MeyGen project, Pentland Firth, Scotland - the world's first commercially grid-connected tidal stream array. Phase 1A (6 MW) was installed in 2017 and generated over 10 GWh by the end of 2018.

Besides the participation in TPSL, we are involved in DEME Blue Energy, together with ParticipatieMaatschappij Vlaanderen, and in cooperation with Nuhma, we are also an equity partner in Bluepower, another tidal equity development company which is developing the West Islay Tidal Energy Park in Scotland (30 MW).

The MeyGen project has performed better than expected, generating over 10 GWh by the end of 2018, and given its successful installation and operation, it is

considered the reference project for the global blue energy industry. The MeyGen development adopts a staged build-out approach with a planned expansion of Phase 1A by two more 2 MW turbines in 2019. This will be followed by the first of the commercial build-out stages, representing a capacity of up to 82 MW. If all the proposed phases, including Phase 2 and 3, come to fruition, MeyGen will have a capacity of up to 398 MW.

### Storage

The climate target to reduce CO<sub>2</sub> emissions in Belgium by 80% by 2050 compared to 2005 levels is a major challenge. Hydrogen can play an important role in the mix of solutions to address this challenge. That is why DEME is joining forces with six other leading players, including the Port of Antwerp and the Port of Zeebrugge. The partners will

make a joint analysis of the entire hydrogen import and transport chain to map the financial, technical and regulatory aspects of the various components in the logistics chain. As a pioneer in the development, construction and financing of offshore wind farms, we want to make full use of our expertise for the production, transport and storage of green hydrogen from renewable energy sources.

In 2019, the European Commission granted the status of Project of Common Interest (PCI) to a multifunctional island with an important pumped hydro storage function. Its realisation within a participative, co-creation framework is currently being studied.

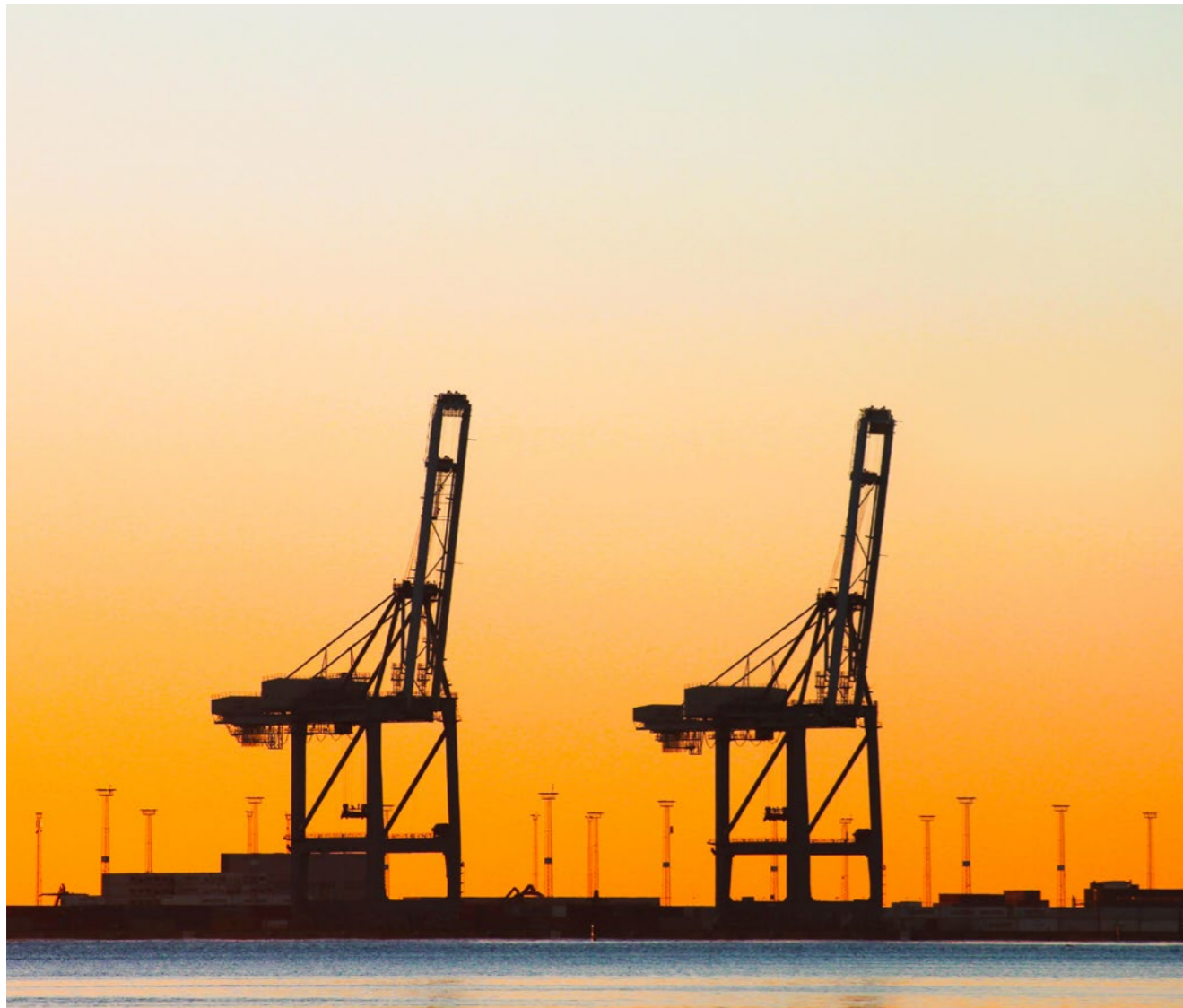


## INFRA STRUCTURE

### Blankenburg Connection

Rijkswaterstaat (The Directorate-General for Public Works and Water Management of the Netherlands) awarded the EUR 1 billion, Public-Private Partnership project 'A24 Blankenburg Connection' to the BAAK Consortium in 2018, which consists of DEME Concessions, Ballast Nedam and Macquarie Capital. The project includes the design, build, finance and maintenance for a period of 20 years using existing and new infrastructure.

The A24 Blankenburg Connection connects the A20 and the A15 and will improve access to Rotterdam. This project is in full swing and highlights our capability to leverage synergies within our Group.



## PORT CONCESSIONS

### Port of Duqm, Oman

In a first for DEME Concessions, we have become a port authority in the Port of Duqm in Oman, teaming up with the Port of Antwerp International and the Government of Oman. DEME Concessions and the Port of Antwerp International have a 50% share in the joint venture with the government.

This huge port is located 550 km to the north of the capital Muscat. The joint venture has been granted a long-term concession to co-invest, operate and manage the port. Our goal is to contribute to the development of port marine services such as towage, pilotage, bunkering and assist in the commercial development of drybulk, container and logistics activities.



## MINERAL CONCESSIONS

### GSR

Our specialist subsidiary Global Sea Mineral Resources (GSR) focuses on the development of a sustainable marine harvesting industry. In 2013 we signed a 15-year contract with the International Seabed Authority to prospect and explore polymetallic nodules. Under this contract, we have the exclusive rights for the exploration of 76,728 square km of seabed in the North Equatorial Pacific Ocean, in 4,000 to 5,000 m water depth, between Hawaii and Mexico.

# GLOBAL SEA MINERAL RESOURCES



Nodule collector pre-prototype Patania II

Working at the true cutting edge of technology and in the deepest parts of the Pacific Ocean is both exciting and challenging. In 2019 GSR, our deep-sea specialist, embarked on an expedition to perform functionality testing of Patania II, a purpose-built, pre-prototype polymetallic nodule collection vehicle.

This expedition is part of our ProCat project which started in 2016 following the award of a 15-year contract for exploration rights for polymetallic nodules with the International Seabed Authority (ISA). Under this contract, we have the exclusive rights for the exploration of 76,728 square km of seabed in the North Equatorial Pacific Ocean, in 4,000 to 5,000 m water depth, between Hawaii and Mexico.

## Pacific expedition

With much anticipation and a pioneering spirit, GSR travelled to the Pacific Ocean in March 2019 to carry out a rigorous test programme. On a test dive, when Patania II reached a 3,000 m water depth, all power and communication to the vehicle was lost. Damage had occurred to a critical cable, which resulted in the power failure.

The cable, known as an umbilical, is 5 km long and contains specialised wiring to power, control and communicate with Patania II from a surface support vessel, as well as hold Patania II's 25-tonne weight. Unfortunately, the damage meant that GSR's mission had to be postponed while the winch and umbilical are being re-engineered. GSR is determined to overcome this hurdle and will return to the Pacific in 2020.

## JPI OCEANS – MiningImpact 2018-2022

GSR has teamed up with JPI Oceans (an intergovernmental platform coordinating marine and maritime research funding), which involves 31 partners from nine European countries. The 'MiningImpact 2018-2022' project is an independent, transnational scientific research project, initiated through

JPI Oceans with the aim of studying the environmental impacts and risks of deep-sea mining for the benefit of all potential users of such scientific information.

GSR is facilitating the independent study of the impact of its activities as part of its precautionary approach to seabed mineral exploitation.

## Cook Islands' exploratory mission

Our partnership with the state-owned Cook Islands Investment Corporation (CIIC) began in 2012. Through our joint venture with CIIC, we assisted the Cook Islands in securing a 15-year polymetallic nodule exploration contract in international waters, and we carry out exploration work on their behalf. The joint venture also allows us to partner with the Cook Islands' government for mineral exploration within its Exclusive Economic Zone.

GSR successfully conducted its first offshore research campaign in the Cook Islands' national waters in September 2019.

Conducted on board the MV Grinna II, the research mission involved the deployment of 'free-fall grab samplers' at 5,100 m deep for the collection of nearly half a tonne of polymetallic nodules which will provide crucial mineral resource information. This minerals-focused research campaign was the first in a decade for the Cook Islands and was conducted under the supervision of the Cook Islands' Seabed Mineral Authority.

We are excited to compare new observations with historical data. Most of the nodules have been sent to Belgium for further research and analysis.



## Signatory to the UN's Global Compact Sustainable Ocean Principles

This year we were among the first signatories of the UN's Global Compact Sustainable Ocean Principles. In committing to the nine principles, companies pledge to take action to prevent pollution, manage their use of marine resources to ensure long-term sustainability and be transparent about their ocean-related activities and impacts. GSR joined the Sustainable Ocean Business Action Platform in September, a UN initiative to secure healthy and productive oceans.

By supporting principles to engage in ocean sustainability in the lead up to the UN Ocean Conference in 2020, we are demonstrating our commitment to a healthy and productive ocean, while working tirelessly to provide the metals society needs to enable a transition to a decarbonised world.

## Sustainable Development Goals

We are also fully committed to the UN's Sustainable Development Goals (SDGs). We believe that the seabed minerals industry – managed and regulated correctly with rigorous environmental protection, effective conservation and stringent enforcement – could significantly contribute to the achievement of at least three SDGs and accelerate our progress towards a clean energy, decarbonised world and closed loop economy.


The three SDGs where we can make a difference are:

**SDG 12** - Ensure sustainable consumption and production patterns.

**SDG 13** - Take urgent action to combat climate change and its impacts.

**SDG14** - Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

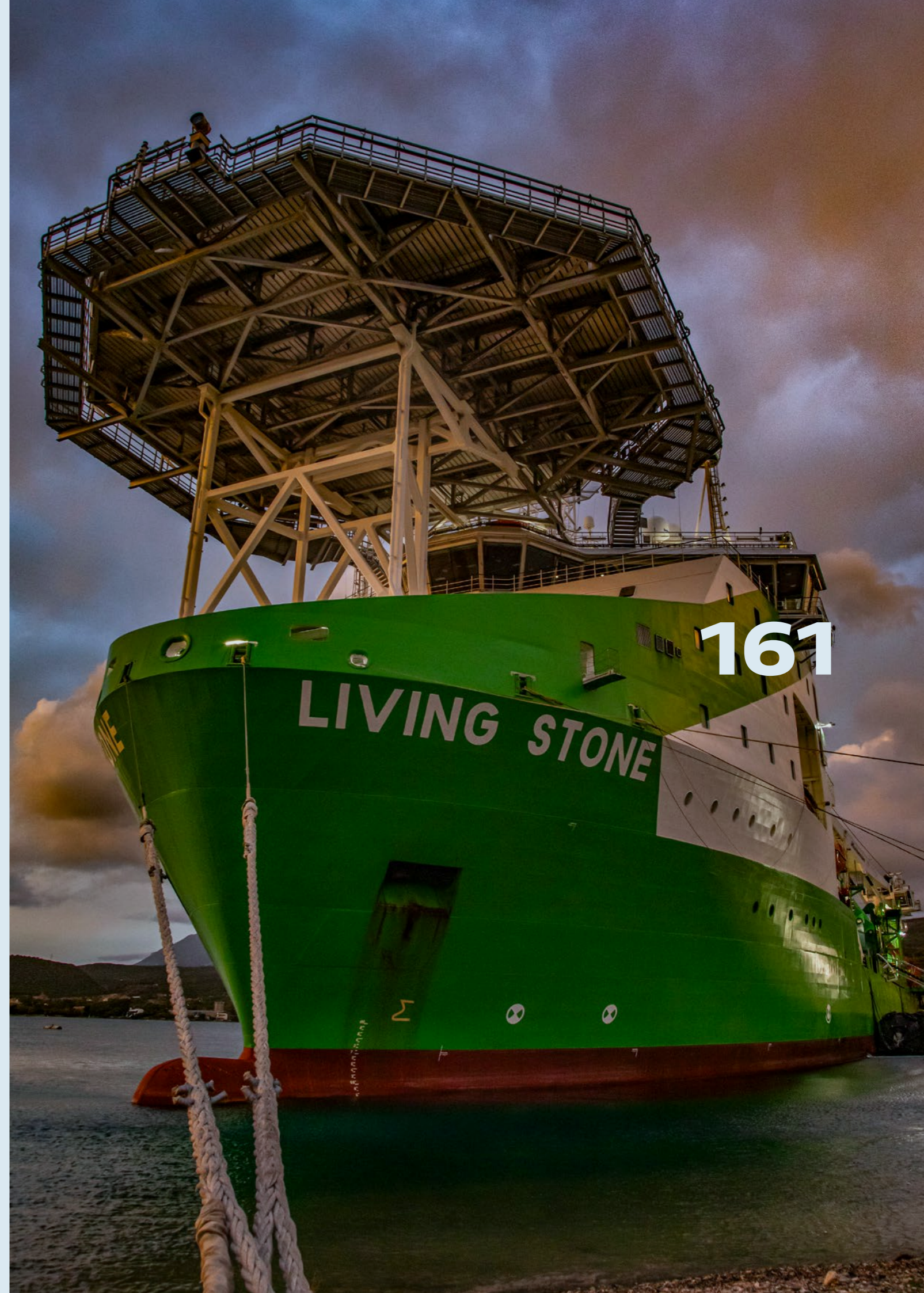
## Blue Nodules

We are also taking part in the 'Blue Nodules' project which ends in 2020. This European Commission-led project focuses on 'Breakthrough Solutions for the Sustainable Harvesting and Processing of Deep-Sea Polymetallic Nodules'. 



Polymetallic nodules contain critical raw materials such as nickel, copper and cobalt.

**FLEET**



# FLEET

## Dredging equipment

### TRAILING SUCTION HOPPER DREDGERS

DP/DT Congo River	30,190 m <sup>3</sup>
DP/DT Pearl River	24,130 m <sup>3</sup>
DP/DT Nile River	17,000 m <sup>3</sup>
DP2 Bonny River, DF	15,016 m <sup>3</sup>
DP/DT Lange Wapper	13,700 m <sup>3</sup>
DP/DT Uilenspiegel	13,700 m <sup>3</sup>
DP/DT Breughel	11,796 m <sup>3</sup>
DP/DT Brabo	11,650 m <sup>3</sup>
DP/DT Breydel	11,296 m <sup>3</sup>
Antigoon	8,460 m <sup>3</sup>
DP/DT Scheldt River, DF	8,400 m <sup>3</sup>
DP/DT Meuse River*, DF	8,300 m <sup>3</sup>
Artevelde	5,580 m <sup>3</sup>
Marieke	5,600 m <sup>3</sup>
Reynaert	5,580 m <sup>3</sup>
Pallierter	5,320 m <sup>3</sup>
Charlemagne	5,000 m <sup>3</sup>
Victor Horta	5,136 m <sup>3</sup>
Mellina	3,309 m <sup>3</sup>
Minerva, DF	3,500 m <sup>3</sup>
Orwell	2,575 m <sup>3</sup>
River Thames	2,501 m <sup>3</sup>

### CUTTER SUCTION DREDGERS

Spartacus, DF*	44,180 kW
D'Artagnan**	28,200 kW
Ambiorix**	28,200 kW
Al Jarraf	12,860 kW
Amazone	12,860 kW
Al Mahaar	11,224 kW
Rubens	10,896 kW
Ganga	6,250 kW
Cap Martin	5,541 kW
Dijle	2,632 kW
Vlaanderen XVI	1,786 kW
Seçkin	1,180 kW
Blanew	565 kW
Pixy	465 kW

### BACKHOE DREDGERS

Samson	4,124 kW
Pinocchio	2,416 kW
Peter The Great	1,964 kW

### BUCKET LADDER DREDGERS

Adriatico	900 l
Bayard	300 l
Belgica	175 l

### SELF-PROPELLED SPLIT HOPPER BARGES

DI 68	1,000 m <sup>3</sup>
DI 69	1,000 m <sup>3</sup>
Pantagruelle	2,000 m <sup>3</sup>
Sloeber	2,735 m <sup>3</sup>
Pagadder	2,735 m <sup>3</sup>
Vlaanderen VII	1,000 m <sup>3</sup>
Vlaanderen VIII	1,000 m <sup>3</sup>
Bengel* °	3,595 m <sup>3</sup>
Deugniet* °	3,595 m <sup>3</sup>

### WATER INJECTION DREDGERS

Parakeet 2 x 6,207 m <sup>3</sup> /h
Dhamra 2 x 6,000 m <sup>3</sup> /h

### DREDGING PLOUGHS

Aramis
Buckingham
Parakeet
Dhamra

### SPREADER & MULTIPURPOSE PONTOONS

Adriatico
DP/DT Al Dana
DP/DT Bayard II
DP/DT Naseem
DP/DT Thornton 1
DP/DT Vagant
De Otter
Matteoor

### INLAND/RIVER DREDGERS

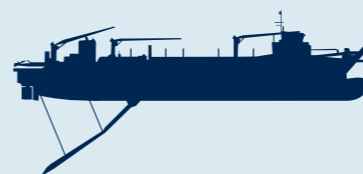
TRAILING SUCTION HOPPER DREDGERS	
Piet Hein	995 m <sup>3</sup>
Zeeland	735 m <sup>3</sup>

PLAIN SUCTION DREDGERS	
Grinza 6 and 7	646 m <sup>3</sup>

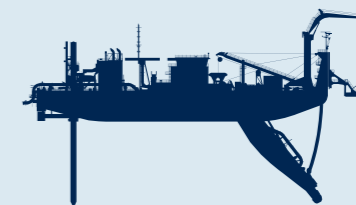
BARGE UNLOADING SUCTION DREDGERS	
Texel	2,076 kW
Vlieland	925 kW

BACKHOE DREDGERS	
IJburg	3-5 m <sup>3</sup>
VW9, VW47, VW55	1.5-3 m <sup>3</sup>

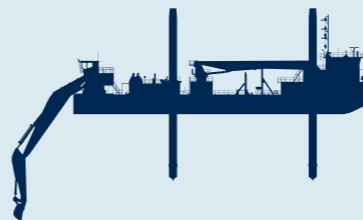
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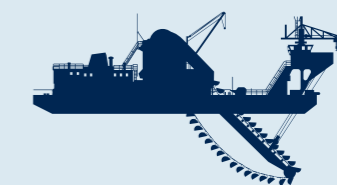
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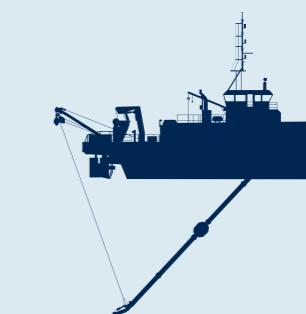
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\* Delivery 2020/21

\*\* Incl. D.R.A.C.U.L.A.®power

° Can be equipped as TSHD

DF Dual Fuel Main Engines (LNG/MGO)

DP/DT Dynamic Positioning / Dynamic Tracking

# FLEET

## Offshore equipment

### OFFSHORE INSTALLATION VESSELS

<b>FLOATING OFFSHORE INSTALLATION VESSEL</b>	<b>9</b>	
DP3 Orion, DF*	30,000 t	
Crane	5,000 t	
<b>JACK-UP OFFSHORE INSTALLATION VESSELS</b>	<b>10</b>	
DP2 Innovation	8,000 t	
Crane	1,500 t	
DP2 Sea Installer	7,400 t	
Crane	900 t	
DP2 Sea Challenger	7,400 t	
Crane	900 t	
DP2 Apollo	4,500 t	
Crane	800 t	
DP2 Thor	2,600 t	
Crane	500 t	
DP2 Neptune	1,600 t	
Crane	600 t	
DP2 Goliath	1,400 t	
Crane	400 t	
<b>FALLPIPE VESSELS</b>	<b>11</b>	
DP2 Flintstone	17,500 t	
DP2 Seahorse***	16,500 t	
DP2 Rollingstone	11,500 t	

### CABLE INSTALLATION & MULTIPURPOSE VESSEL

DP3 Living Stone, DF	<b>12</b>	
Cable Installation	10,000 t	
Rock Placement	12,000 t	

### HEAVY LIFTING EQUIPMENT

Gulliver***	<b>13</b>	4,000 t
Rambiz***		3,300 t

### OFFSHORE MAINTENANCE & SERVICE VESSELS

Aquata	<b>14</b>	12 pax
Arista		12 pax
Swath SOV*		25 pax

### OFFSHORE PONTOONS

Bremen	10,000 t
Wismar	10,000 t
Stralsund	10,000 t

### MULTIPURPOSE DRILLING VESSEL

DP2 Omalius

## Environmental technology

### FIXED SEDIMENT RECYCLING CENTRES

DEC Puurs	<b>16</b>
DEC Zeebrugge	
DEC Zwijndrecht	
DEC Heusden-Zolder	
DEC Gent-Zeehaven	
DEC Deinze	
SEDISOL Charleroi	

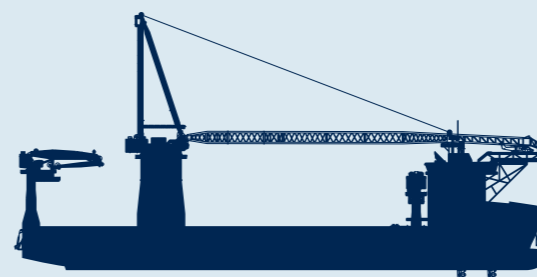
### FIXED SOIL RECYCLING CENTRES

GRC Kallo, Port of Antwerp	<b>16</b>
GRC Brugge, Port of Zeebrugge	
GRC Zolder, Albertkanaal	
Petit Try, Charleroi	
Filterres, Seraing	
Cetraval, Tubize	
Offshore Waste Centre (NL)	

### MOBILE TREATMENT PLANTS

Mobile filter presses
Mobile immobilisation plants
Mobile soil washing plants
Mobile thermal plant

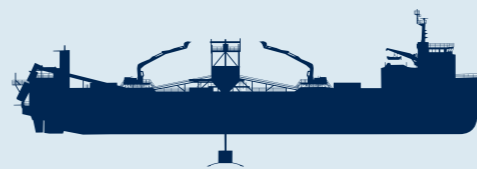
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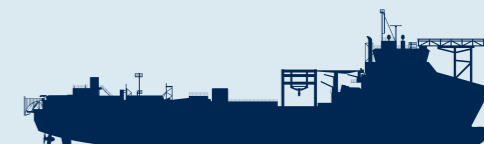
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13



14



15



16



\* Delivery 2020/21  
\*\*\* Co-ownership

DF Dual Fuel Main Engines (LNG/MGO)  
DP/DT Dynamic Positioning / Dynamic Tracking



### Forward-looking Statements

This activity report may contain forward-looking statements. Such statements refer to future expectations and other forward-looking perceptions that are based on the management's current views, estimates and assumptions concerning future events. Such forward-looking statements, by their nature, are subject to known and unknown risks, uncertainties and other factors, which may cause the actual results to be materially different from those contemplated, projected, forecasted, estimated or budgeted whether expressed or implied, by these forward-looking statements contained in this activity report.

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