



**ACTIVITY  
REPORT** 2021

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INTRODUCTION



# COMPANY PROFILE

DEME is a world leader in the highly specialised fields of dredging, solutions for the offshore energy market, infra 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 worldwide. We can rely on around 5,000 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.

We also 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.

In line with our ambitions to have a long-term, sustainable business our activities in the

## ALTHOUGH OUR ACTIVITIES ORIGINATED WITH OUR CORE DREDGING BUSINESS, OUR PORTFOLIO HAS DIVERSIFIED SUBSTANTIALLY OVER THE DECADES.

Our vision is to work towards a sustainable future by offering solutions for global challenges: rising sea levels, a growing population, reduction of emissions, polluted rivers, seas and soils, and a 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 and environmental solutions. These multidisciplinary capabilities and ability to benefit from synergies across projects, as well as our integrated corporate structure, have made us into a global solutions provider.

offshore wind industry are being extended outside of Europe, to Asia and the US and we have also entered the green hydrogen market with several initiatives underway.

We continuously strive for improvements in our environmental performance and productivity rates, and this is highlighted in our ongoing investments in our fleet and equipment.

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



LUC  
BERTRAND  
Chairman  
DEME Group

LUC  
VANDENBULCKE  
CEO  
DEME Group

**2021 again showed the strength and resilience of our employees. Projects have continued and been successful worldwide, and the Group managed to end the year with a record high orderbook. This would be an impressive achievement in any year, let alone one where everyone is dealing with the impact of a global pandemic.**

We would personally like to thank our people for their courage, flexibility and determination. Our crew, project teams and office staff have really gone above and beyond and made tremendous efforts to make progress. This is highlighted by some fantastic new contracts we have been awarded - Port-La Nouvelle, Coastal Virginia Offshore Wind, Dogger Bank, the long-term maintenance dredging contract for the River Scheldt and Belgian coast - to name but a few.

As well as having an incredibly strong team, our continuing focus on QHSE is undoubtedly at the heart of this success. Our clients want to know their complex, multidisciplinary projects are in safe hands. At the Lower Ok Tedi project in Papua New Guinea we achieved 10 years LTI-free. In Poland, at the Świnoujście - Szczecin fairway project, we also achieved a remarkable safety milestone, with more than 2.3 million LTI-free manhours.



**Our crew, project teams and office staff have really gone above and beyond and made tremendous efforts to make progress.**

LUC BERTRAND | CHAIRMAN DEME GROUP

### SAFETY FOCUS

While we are proud of these accomplishments, improving safety is a never-ending task. To encourage everyone to remain vigilant, we organised several events and initiatives throughout the year. One of these was our campaign highlighting 'Safety Success Stories'. Colleagues could share their knowledge and best practice about specific initiatives they have taken to make sure their working environment is as safe as possible. This has been a major internal "employee crowd" initiative.

Our ongoing efforts have also been recognised by our clients. Both the Jurong Island Westward Extension and Ayer Merbau Reclamation Phase 2 projects in Singapore received safety awards. We are proud that DEME's rigorous safety standards are appreciated and needless to say, our efforts will continue. We will remain vigilant.

### TOP EMPLOYER

We were delighted when DEME was again awarded the official certification from the Top Employers Institute, the global authority which recognises HR excellence. The award underlines the first-rate working conditions we have in place where our people have the opportunity to thrive and grow in their career. Our reputation as a great employer has enabled us to recruit more than 250 people in 2021. But given the number of new projects all over the world, we are continuing our recruitment drive. Given the diverse range of opportunities at DEME, we are confident we can find new colleagues keen to embark on an exciting career.

### DRIVING SUSTAINABILITY

Alongside safety, sustainability – and working towards a greener planet - is at the heart of DEME and can be seen in all aspects of our business. In order to cut greenhouse gas emissions and reduce our carbon footprint we are aiming to have one of the most modern, efficient fleets in the industry. A substantial part of our fleet can already operate on LNG and we are exploring the use of other clean fuels too. This includes our latest arrival, the mega cutter suction dredger 'Spartacus', which entered service and travelled directly to its first project powered by LNG.

HYPOR<sup>®</sup> Duqm is another clear example of how DEME is facilitating the growth of clean fuels. DEME and its partners will establish an industrial-scale, green hydrogen plant in Duqm. This flagship project, being carried out together with our local partner OQ Alternative Energy LLC, made very good progress in 2021. We signed a cooperation agreement with energy giant Uniper and secured its 150 km<sup>2</sup> site in the Special Economic Zone. Combining innovative technologies at scale, this is one of very few lighthouse projects worldwide which encompass the full value chain.

We have won a number of megaprojects whereby we are supporting the energy transition and the move to a more sustainable planet. In a remarkable accomplishment, Thistle Wind Partners, a consortium including DEME Concessions, was awarded 2 GW worth of option areas in Scotland's highly competitive ScotWind seabed leasing process, which includes both fixed and floating foundations.



**After many years of building up our presence in the US market, we had a crucial breakthrough and landed three major contracts in the offshore wind sector.**

LUC VANDENBULCKE | CEO DEME GROUP

Then in a landmark deal, and after many years of building up our presence in the US market, we had a crucial breakthrough and landed three major contracts in the offshore wind sector: Coastal Virginia Offshore Wind, Vineyard Wind 1 and South Fork offshore wind farm. Representing a total capacity of 2.6 GW, Coastal Virginia Offshore Wind is the largest offshore wind installation contract ever awarded in the US.

Following a public tender, we were awarded the 'Sustainable maintenance dredging works in the maritime access channels' contract for the River Scheldt and Belgian coast. Under this contract, we were scored on our ability to provide both technically advanced vessels and those that are able to excel in environmental technologies.

We are also encouraging our employees to play an active role in our ambitious goal to become climate neutral. For example, we ask our project teams to implement at least one 'Green Initiative' each year. These initiatives go beyond compliance and are employees' actions to make changes or modifications to a process, equipment or setup to minimise the environmental impact.

Separately, we are involved in an initiative to develop two emission-free, heavy mobile machines that are able to run on liquid hydrogen to contribute to the zero-emission construction site. A tank facility for liquid hydrogen and two, 40-tonne hydraulic excavators are currently being built.

### ICONIC PROJECTS

Meanwhile, DEME's vessels have been busy in every corner of the globe. A whole green flotilla has been working on the mammoth Abu Qir 2 project in Egypt. Ultimately, Abu Qir 2 will see a new city and greenfield port constructed. The combined strength of our fleet is clear – the team managed to dredge volumes of 800,000 m<sup>3</sup> in a single day.

We successfully completed the two-year River Elbe deepening and widening project safely, and well within the schedule. This project enables the new generations of container vessels to access the Port of Hamburg independently of the tides. In another part of the globe, the Tuas Terminal Phase 1 mega container port project in Singapore was largely completed.

### THE NUMBER ONE OFFSHORE WIND CONTRACTOR

In Offshore we had an extraordinary year. DEME has now installed more than 2,500 turbines, underlining its position as the number one offshore wind farm contractor in the world. Just a few of the impressive achievements include the breakthrough in the US market we have already highlighted and the Saint-Nazaire offshore wind farm project in France, where DEME is the first contractor in the world to install an entire wind farm into rock.

**Meanwhile, DEME's vessels have been busy in every corner of the globe. A whole green flotilla has been working on the mammoth Abu Qir 2 project in Egypt.**

LUC VANDENBULCKE | CEO DEME GROUP

In another engineering feat, we successfully completed the installation of the final and 165<sup>th</sup> wind turbine at Hornsea Two in the UK, the world's largest offshore wind farm. Both the WTG and monopile foundation installation scopes were performed in record time.

### FEHMARNBELT FIXED LINK PROJECT

2021 was also an important year for the Fehmarnbelt Fixed Link project, heralded as the infrastructure project of the century. In January work started in Denmark, and then in December, construction kicked off in Puttgarden, Germany. The integrated joint venture team started work on one of six enormous production facilities in Rødby where the tunnel elements will be constructed.

Work on the three major infrastructure projects in the Netherlands - Blankenburg Connection, the New Lock Terneuzen and RijnlandRoute - continued apace. In Belgium, we were delighted to win a second contract for the prestigious 'Oosterweel link' project, which will complete the Antwerp Ring Road.

### CIRCULAR ECONOMY

Our Environmental team is meanwhile preparing to start works on a major contract to remediate the former ExxonMobil site in Bowling near Glasgow. This project highlights the Group's focus on promoting a sustainable and circular economy. More than 90% of the material will be cleaned and reused. In the largest rehabilitation project in the Port of Antwerp ever, DEME and the consortium members, successfully completed work on encapsulating the heavily polluted ruins of Fort Sint-Filips.

Again highlighting our focus on sustainable projects, DEME Concessions has broadened its portfolio of offshore wind projects outside of Europe. A Memorandum of Understanding was signed to develop a 1,000 MW wind farm in Vietnam. In Japan, DEME Offshore and Penta-Ocean Construction Co., Ltd., have established a new company named Japan Offshore Marine Co., Ltd. JOM has been supporting developers in the Round 1 & 2 offshore wind farm submissions and has already signed one Preferred Supplier Agreement. DEME Concessions was also awarded a 40-year port concession for Port-La Nouvelle in a consortium team. This concession directly fits in with our ambitious sustainability goals because the port is undergoing a major redevelopment, which includes establishing a strategic hub for the offshore- and floating wind industry.

### FLEET INVESTMENT CONTINUES

To offer the very best solutions to our clients, DEME continues to invest in its fleet. 2021 was a milestone year as the world's most powerful cutter suction dredger 'Spartacus' joined the fleet. In Abu Qir, the efficiency of this innovative dredger is already showing some impressive results with high production levels, coupled with a substantial reduction in fuel consumption. From the very first day 'Spartacus' has lived up to, and in fact, exceeded our expectations.

The pioneering new offshore installation vessel 'Orion' has entered the fleet. 'Orion' is able to handle the enormous turbines and foundations of the future and is equipped with an integrated motion compensated pile gripper. Meanwhile, the DP3 vessel, 'Green Jade', which is equipped with a 4,000-tonne crane, is taking shape. DEME's first ever Service Operation Vessel, 'Groenewind', is another vessel making waves in the industry. Entering service in June, the performance of the twin-hulled 'Groenewind' has been impressive. Additionally, two major conversions are set to take place. Our two jack-up installation vessels 'Sea Installer' and 'Sea Challenger' will see their crane capacity increased to 1,600 tonnes.

More recently, DEME has entered into an agreement to acquire the DP3 offshore installation vessel 'Viking Neptun'. This move highlights DEME's commitment to its customers, and supports the continued growth of the offshore wind industry. With massive cable-carrying capacity, we are certain that 'Viking Neptun' will have an equally successful career as our renowned cable installation vessel 'Living Stone'. 🌱

**From the very first day 'Spartacus' has lived up to, and in fact, exceeded our expectations.**

LUC VANDENBULCKE | CEO DEME GROUP

# OUR VISION

Put simply, DEME's ultimate vision is to help pass on a sustainable planet to new generations to come. Every day we are doing our best to tackle the global challenges we all face, such as rising sea levels, a growing population, a reduction of CO<sub>2</sub> emissions, polluted rivers, seas and soils, and the increasing scarcity of natural resources.

As well as our many projects worldwide, which are directly tackling these challenges, we are also committed to achieving the United Nations Sustainable Development Goals, especially those where we can make the biggest impact. DEME has its own ambitious target to become climate-neutral by 2050.



## RENEWABLE ENERGY

We were already installing offshore wind farms more than two decades ago.

DEME's sustainability governance model focuses on two core elements. On the one hand, we **EXPLORE** sustainable business solutions (continuously challenge ourselves to develop more sustainable solutions) and on the other hand, we aim to **EXCEL** in our operations (sustainable performance in our daily operations). We are addressing sustainability in every aspect of our business, for example, DEME took the bold decision to completely transform its long-term loans' portfolio and instead we have converted them all into sustainability-linked financing packages. This major undertaking shows how we are taking definitive steps, each one taking us closer to realising our vision for a sustainable future.

Pursuing these ambitious goals goes hand in hand with our determined efforts to make progress, and in 2021, we have certainly made progress in all of our Activity Lines – Dredging, Offshore, Infra and Environmental. This has been in the context of another full year of the COVID pandemic.

## FLAGSHIP GREEN HYDROGEN PROJECT

In another demonstration of our actions to support the transition to cleaner energy, DEME has made significant progress with HYPOR<sup>®</sup> Duqm in Oman, which is a flagship green hydrogen project. DEME Concessions and its partners are aiming to establish an industrial-scale, green hydrogen plant in the Port of Duqm. This is at the cutting edge of developments in this sector and is exceptional because it encompasses the full value chain, starting with 100% renewable energy, the production of hydrogen in electrolyzers and then the conversion to green ammonia. DEME Concessions is also aiming to introduce the HYPOR concept to other strategic locations.

As well as this, DEME Concessions is looking into potential opportunities in Europe where there are substantial levels of offshore wind production and exploring where this renewable energy could be combined with the production of green molecules.

## CLEAN ENERGY – MORE THAN 2,500 TURBINES INSTALLED WORLDWIDE

We have achieved several truly remarkable milestones during the year. DEME has now installed more than 2,500 turbines worldwide. DEME was on board from the beginning - perhaps our idea to enter this new industry at the time would be considered a 'moonshot'. But the fact is we were already installing offshore wind farms more than two decades ago. The company showed its courage and we saw an opportunity to create the infrastructure able to produce clean energy. We then backed this up with the necessary investments to make sure this evolving industry would flourish.

As the number one offshore wind farm contractor in the world, our efforts are continuing. In 2021 alone, we installed more than 270 wind turbine generators. Meanwhile in France our leading position is highlighted at the Saint-Nazaire offshore wind farm, where DEME Offshore is showcasing its prowess. We are the first contractor in the world to install an entire wind farm into rock.

DEME's presence in the energy transition is being extended worldwide. We are entering new markets – the US, Taiwan, Brazil, Vietnam and Japan. We have again shown our ability to be an early pioneer. After many years of establishing ourselves in the US offshore wind market we set up our own company, DEME Offshore US LLC, in 2019. Our efforts have led to a major breakthrough when we were awarded three important contracts last year.

## BREATHING NEW LIFE INTO POLLUTED SITES

Our Environmental team has been addressing the problem of polluted soils and rivers for decades. As a front runner in this sector, DEME can now bring its expertise and experience to the most complex remediation projects. This can be seen in projects such as the remediation of the former ExxonMobil site in Bowling near Glasgow. This project also highlights the Group's focus on promoting a sustainable and circular economy - more than 90% of the material will be cleaned and reused.

We are applying our expertise and knowledge to clean these brownfield sites and we are giving them a new life and purpose. An old Renault site, located in Vilvoorde, is being transformed into a new 60-ha city quarter and at Blue Gate in Antwerp, we are turning a heavily polluted brownfield site into a sustainable business park. DEME takes the long-term view which is demonstrated clearly by our early entry into the offshore wind sector and into environmental remediation activities.

### BREATHING NEW LIFE IN POLLUTED SITES

We are applying our expertise and knowledge to clean polluted sites and we are giving them a new life and purpose.

## COASTAL AND FLOOD PROTECTION

With the constant threat of sea level rises and more turbulent weather conditions, DEME is applying its proven solutions to provide both coastal protection and to mitigate the risk of flooding incidents. DEME is also looking for possibilities to use nature-inspired solutions. Following on from the well-known Coastbusters project, a pioneering flood defence solution, we are part of the Bankbusters initiative. This re-examines traditional, unsustainable river embankment management methods and instead aims to develop circular, nature-based solutions. To mitigate the impact of sea level rise and increasing flood risks in estuarine regions, the Bankbusters consortium will research and design an engineered tidal marsh, reusing soft dredged sediments.



### COASTAL AND FLOOD PROTECTION

With the constant threat of sea level rises and more turbulent weather conditions, DEME is applying its proven solutions to provide both coastal protection and to mitigate the risk of flooding incidents.

## CREATING NEW LAND AND SUSTAINABLE INFRASTRUCTURE FOR THE FUTURE

DEME has been creating new land and sustainable infrastructure for more than 140 years as the global population increased and countries wanted to trade and boost their economies. 2021 was no exception, and indeed we have been working on the largest land reclamation and dredging project in our history at Abu Qir in Egypt. This enormous project will result in a new city and greenfield port. In 2021, the fleet reclaimed well over 130 million m<sup>3</sup> of material. Meanwhile in Singapore, the Tuas Terminal Phase 1 megaproject was largely completed. TTP1 included the reclamation of 88 million m<sup>3</sup> of land from the sea.

DEME is also playing an important role in the Fehmarnbelt Fixed Link project, heralded as the infrastructure project of the century. We are involved in all aspects of the project but we are leading the marine works. At 18 km, the Fehmarnbelt Fixed Link will be the longest immersed road and rail tunnel in the world. Connecting Denmark's Lolland Falster region with Germany's Schleswig Holstein region, the new infrastructure will shorten journey times substantially and foster trade and tourism in Northern Europe for the generations to come.



## TACKLING THE SCARCITY OF RESOURCES – SUSTAINABLE DEEP SEA HARVESTING

Tackling the scarcity of our planet's resources is another important part of our vision. Global Sea Mineral Resources (GSR), DEME's deep-sea exploratory division, took another important step in its ambition to responsibly collect metal-rich, polymetallic nodules from the deep ocean floor. GSR believes that these nodules could become an important source of high-grade, low carbon critical minerals such as nickel, cobalt, manganese and copper.

Given the move towards a decarbonised energy system and a growing and rapidly urbanising global population, demand for these metals is rising dramatically. In 2021, our team successfully tested GSR's pre-prototype nodule collector, Patania II, at a depth of 4,500 m, while being independently monitored by a consortium of EU scientists. GSR is taking a step-by-step, precautionary approach however. DEME will only pursue this ambition if the science shows that deep seabed minerals have less impact on the environment compared to relying solely on new and existing mines on land.

## REGREENING AND RESTORING ECOSYSTEMS

Restoring vulnerable ecosystems is another major focus of DEME. Loss of biodiversity and desertification are other global challenges we are addressing. We are taking a proactive role in finding greening solutions, particularly where we can support the socio-economic development of the region.



### SCARCITY OF MINERAL RESOURCES

Given the move towards a decarbonised energy system and a growing and rapidly urbanising global population, demand for mineral resources is rising dramatically.

## REDUCING EMISSIONS IN ALL AREAS OF OUR BUSINESS

Whether it's via the many clean energy projects we work on throughout the world or directly from our own operations, DEME is pursuing its ambition to reduce greenhouse gas emissions and its climate footprint. A key pillar in this is our multi-year investment programme to have the most modern, sustainable fleet in the industry. A significant part of our fleet can be powered by LNG and we are exploring the use of other clean future fuels too. DEME's new flagship, the giant cutter suction dredger 'Spartacus' entered service this year and sailed directly to Egypt on LNG. We were also successful in a recent public tender in Belgium, entitled the 'Sustainable maintenance dredging works in the maritime access channels' because of our ability to deploy technically advanced vessels and those that are able to excel in environmental technologies. Our hopper dredger 'Scheldt River', which can also be powered entirely by LNG, is being deployed for this project.

### LOCAL COMMUNITIES

Our 'One DEME' community is unbeatable and we also aim to bring this DEME spirit to the communities where we operate.



## PARTNERING COMMUNITIES

Our 'One DEME' community is unbeatable and we also aim to bring this DEME spirit to the communities where we operate. We strive to build sustainable partnerships and are involved in several social projects where we can give back to the local residents and support them to achieve their dreams and ambitions. Many of these initiatives are driven by our own employees, who spend years working at the heart of these communities.

## INNOVATIVE DISRUPTORS

Innovation too, is an equally important reason why our customers choose DEME. We are known for our ability to question well-known industry methods and techniques and to see if we can improve them. The inquiring minds of our people enables DEME to succeed, even when the challenges are complex. A prime example is the Saint-Nazaire offshore wind farm, which is the first to use drilled, XL monopile foundations.

## COMMITTED TO DELIVERING EXCELLENCE

To make sure we have a strong foundation we operate according to our 'STRIVE' values: Safety, Technical Leadership, Respect & Integrity, Innovation, Value creation and Environment. These are applicable to the entire DEME Group and show our commitment to consistently delivering excellence. Not only that, we encourage our suppliers, subcontractors and partners to adhere to these standards too. We understand that we can only achieve our ambitious sustainable targets by working together.

## A DIVERSE, TALENTED WORKFORCE

DEME always has the safety and wellbeing of our people at the top of its agenda, and this is not just our own employees, but anyone we do business with and indeed, any community where we are present. DEME is a diverse, multicultural company, with some 80 nationalities working for our company worldwide. Our people are special: talented, adaptable, able to come up with smart solutions whatever they are faced with. As we know, 2021 is the second year of the COVID-19 pandemic and yet our projects have continued. Our determination to keep our customers satisfied meant that everyone persevered despite the challenges – projects have made progress or been successfully completed. 🌱

## OUR MANAGEMENT TEAM



LUC VANDENBULCKE  
CHIEF EXECUTIVE OFFICER



ELS VERBRAECKEN  
CHIEF FINANCIAL OFFICER



ERIC TANCRÉ  
MANAGING DIRECTOR  
ACTIVITY LINE DREDGING &  
ACTIVITY LINE INFRA



HUGO BOUVY  
MANAGING DIRECTOR  
ACTIVITY LINE OFFSHORE



PHILIP HERMANS  
MANAGING DIRECTOR  
ACTIVITY LINE DREDGING



KOEN VANDERBEKE  
STRATEGIC OPERATIONS  
DIRECTOR



MARTIN D'UVA  
MANAGING DIRECTOR  
DEME CONCESSIONS



BART VERBOOMEN  
MANAGING DIRECTOR  
TECHNICAL DEPARTMENT



SOFIE VERLINDEN  
HEAD OF LEGAL



HANS CASIER  
CHIEF HUMAN RESOURCES  
OFFICER



DIRK POPPE  
MANAGING DIRECTOR  
ACTIVITY LINE  
ENVIRONMENTAL



RONNY SIMONS  
GENERAL MANAGER  
DEME INFRA



DIRK DEFLOOR  
AREA DIRECTOR  
BENELUX



KRISTOF VAN LOON  
GENERAL MANAGER  
DEME CONCESSIONS



CHRISTOPHER IWENS  
AREA DIRECTOR  
ASIA PACIFIC



WOUTER BORGHIJS  
GENERAL MANAGER  
DEME OFFSHORE



STEVEN POPPE  
AREA DIRECTOR  
AFRICA & AMERICAS



BART DE POORTER  
GENERAL MANAGER  
DEME OFFSHORE



CHRISTINE CUYT  
ASSISTANT TO THE  
MANAGEMENT TEAM



STEVEN BOUCKAERT  
GENERAL MANAGER  
DEME CONCESSIONS



AMEDEO PEYRON  
AREA DIRECTOR  
MIDDLE EAST  
AND SOUTH ASIA

## OUR EXECUTIVE COMMITTEE



LUC VANDENBULCKE  
CHIEF EXECUTIVE OFFICER



PHILIP HERMANS  
MANAGING DIRECTOR  
ACTIVITY LINE DREDGING



ELS VERBRAECKEN  
CHIEF FINANCIAL OFFICER



ERIC TANCRÉ  
MANAGING DIRECTOR  
ACTIVITY LINE DREDGING &  
ACTIVITY LINE INFRA



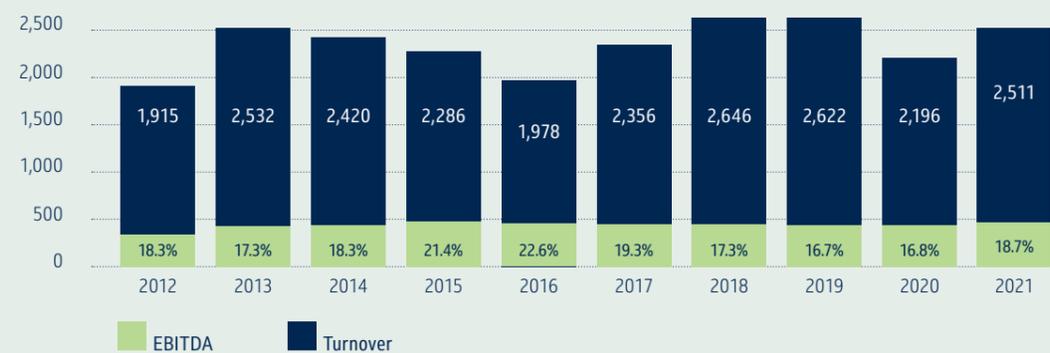
HUGO BOUVY  
MANAGING DIRECTOR  
DEME OFFSHORE

## FINANCIAL HIGHLIGHTS

DEME Group key figures As of December 31 (in millions of EUR)	2021	2020	DELTA
Turnover	2,510.6	2,195.8	314.8
EBITDA	469.3	369.5	99.8
EBIT	143.3	64.3	79.0
Net result from joint ventures and associates	10.5	22.4	-11.9
Net result share of the Group	114.6	50.4	64.2
Order book	5,905.2	4,500.1	1,405.1
Shareholders' equity (excl. minority interests)	1,579.5	1,467.5	112.0
Net financial debt	-392.7	-489.0	96.3
Operating working capital	-488.7	-556.6	67.9
Balance sheet total	4,049.6	3,919.9	129.7
Total investments	298.7	258.8	39.9
Dividend of the year	40.8	20.4	20.4
<b>NON-FINANCIAL KEY FIGURES</b>			
Average # personnel (in FTE)	4,880	4,976	-96
Ratio male/female personnel (%)	85/15	85/15	-
Number of nationalities	80	80	-
Lost Time Incident Frequency Rate (LTIFR)	0.19	0.19	-
GHG emissions worldwide in 1,000 tonne CO <sub>2</sub> -eq. (scope 1 & 2)	833	660	173
Occupancy rate of Trailing Suction Hopper Dredgers (in weeks)	41.4	37.5	3.9
Occupancy rate of Cutter Suction Dredgers (in weeks)	25.3	10.5	14.8
Occupancy rate of Offshore equipment (in weeks)	42.2	42.0	0.2

### 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. The amount also includes our share in the order book of joint ventures, but not of associates.

**Operating working capital** is net working capital (current assets less current liabilities), excluding interest-bearing debt and cash and cash equivalents and including other non-current assets.

**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.

The **occupancy rate** is the weighted average operational occupation in weeks of the DEME fleet expressed over a given calendar year.

For the definitions of the **non-financial key figures**, as well as further information about the topics, we refer to the **Sustainability Report**.



PBXN

ROT-R  
0057m

ROT-R-1  
0359m

SMR-R  
0051m

27

COMPANY  
OVERVIEW



# OUR PEOPLE

Despite the continuing disruption brought about by the pandemic in 2021, DEME had the benefit of many lessons learnt from the early days of the crisis. This meant the company was far better equipped and prepared to tackle the challenges.

Our COVID Taskforce led the effort and strict mitigation measures are in place worldwide. But ultimately, even in this context, the commitment and drive of DEME's employees has shone throughout, and this has enabled the company to end the year with a record high order book.

## 24/7 DEDICATION

The resilience and 24/7 dedication of DEME's employees during the pandemic is impressive – and we know that the last two years have been gruelling and that this commitment, flexibility and perseverance cannot be taken for granted. DEME's crews and project teams have sometimes had to face weeks of mandatory quarantine, many times a year, which is both mentally and physically challenging. But they have kept going, showing true grit and determination.

The Crew Planning team has also made a tremendous effort to carry out crew changes successfully, although they have been faced with a spider's web of COVID mitigation measures, travel restrictions and visa regulations. This immense, collective effort has enabled all of our operations, throughout the globe, to continue, and this includes some of the largest, most complex projects in DEME's history.

## FUTURE-PROOF IT SYSTEM

In May the new HR IT system 'Workday' went live, involving an employee self-service approach. All aspects related to HR can now be digitally managed by our employees, with one single source of data, making career development, reporting, and planning much easier. The new system also improves the recruitment process and contracting procedures due to digital signing functionalities that have been introduced. Everyone can easily get access to the information they need and there is one single source of information in place for the whole DEME population.

## TRAINING & DEVELOPMENT

Rapidly adapting to the new 'norm' in relation to social distancing, DEME still offers its extensive range of in-house, tailor-made training and management courses. However, there is now a digital hybrid version of many of them, which combines traditional 'classroom' teaching with remote learning. All of the courses have been updated to include COVID-specific protocols too.

## RECRUITMENT

DEME's digital capabilities are also highlighted when it comes to recruitment. Despite the challenges of having to hire people remotely, the recruitment team's innovative approach has enabled the company to attract new talent and people of the right calibre. Onboarding has sometimes been forced to go online, but the 'DEME Welcoming Day' and 'Basics for Starters' courses have been adapted. However, given the company's growth and the many projects coming along, the company is still looking to recruit more people to join the DEME team.



Crew and staff kept going during the pandemic, showing true grit and determination.



DEME encourages sports and wellbeing activities and offers the Energy@DEME programme to all employees.

## ENERGY@DEME

For the 18th year in a row, the Energy@DEME initiative continued, offering a varied sports and wellbeing programme to employees worldwide. The programme keeps on attracting more and more employees to participate in sports events and virtual sports challenges. We also relaunched the DEME Heroes programme. The Heroes took up the challenge to embark on a life changing journey and received medical and nutritional coaching throughout the year. They all successfully completed the Antwerp 10 Miles run or one of the Flanders Classic cycling races. 🌱

## DEME'S CORE VALUES

We have established a set of standards applicable to our business units and subsidiaries worldwide. These core values demonstrate 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. At DEME, we define our company culture using the acronym STRIVE.

### S 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.

### T 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 address the needs and challenges of our customers.

### R 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.

### I INNOVATION

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

### V VALUE CREATION

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

### E ENVIRONMENT

We protect the environment and the communities in which we do business by limiting our impact and exploring opportunities for sustainable value creation together with our stakeholders.

# SUSTAINABILITY

**At DEME, it is our ambition to fundamentally contribute to sustainable solutions for the global environmental, societal and economic challenges facing our world today.**

Every day we are involved in a wide range of large, complex projects worldwide, ranging from dredging and land reclamation to infra marine infrastructure, environmental and offshore energy works. All these projects have a potential impact – positive or negative, minor or substantial – on communities, local economies and the overall climate.

We always strive to improve the sustainability of our own operations.

**An intense internal cooperation process took place across our activities, leading to a two-dimensional strategy for sustainable performance.**

01

## TO EXPLORE SUSTAINABLE BUSINESS SOLUTIONS

by continuously challenging ourselves to enlarge our sustainable business portfolio and to align our business decisions with the Sustainable Development Goals where DEME can create the most impact.

02

## TO EXCEL IN OUR OPERATIONS

by maintaining and strengthening a sustainable performance in our daily operations.

This strategy will help us to create sustainable value for our customers, DEME and society.



## OUR COMMITMENT TO THE SUSTAINABLE DEVELOPMENT GOALS

It is undeniable that the world is facing multiple global challenges that could have a serious impact on society and the environment unless we take action now. With its 17 Sustainable Development Goals (SDGs), the UN has identified its priorities for creating a better world by 2030.

While these goals address different themes and aspects of sustainability, they are all interconnected. Together, they

will help us to overcome global poverty, stop climate change and fight inequality so that we all live in a better world.

At DEME, we are fully committed to helping achieve the SDGs. These goals have helped us to understand the economic, environmental and social impact of our operations as we move towards a project portfolio with a strong sustainable focus.

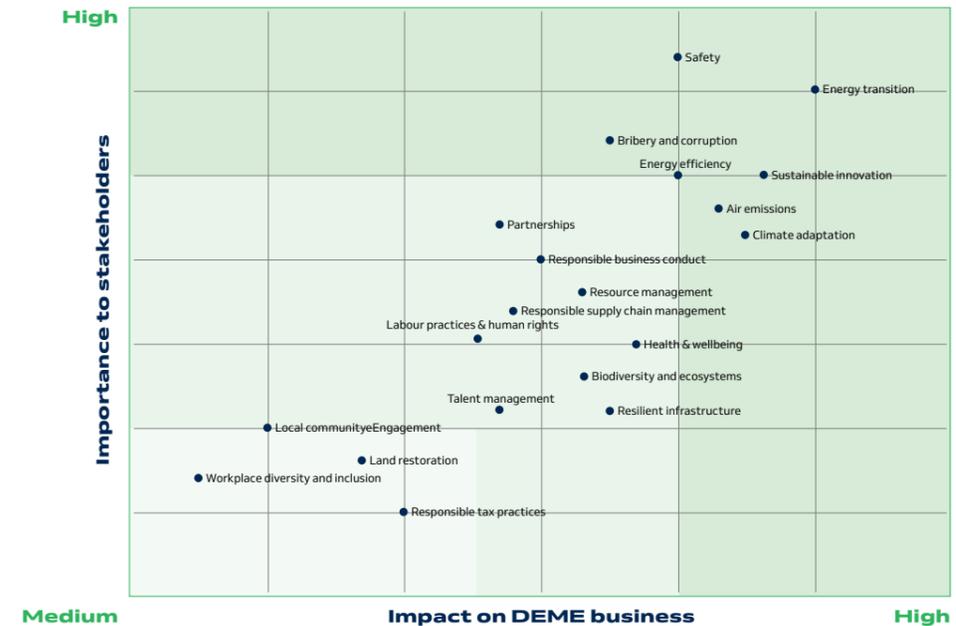
## MATERIALITY MATRIX

To understand the key Sustainable Development Goals and related sustainability themes where we can have the most impact, extensive stakeholder consultations were conducted in 2017 and 2018. These in-depth stakeholder consultations and additional research resulted in a materiality matrix reflecting key priorities, based on business impact and importance to our stakeholders. The materiality assessment helped us to further define our two-dimensional sustainability strategy, resulting in eight key sustainability

themes which are the drivers for our sustainable performance.

In 2021 we worked to further refine the implementation of these eight key sustainability themes on those impact areas that are most relevant for our business and for our external stakeholders. Consequently, we set up an operational framework of well-defined sustainability programmes connecting our ambitions with clear targets, action plans and performance indicators in a coherent and structured way.

DEME's Materiality Matrix 2021



For further information on DEME's approach to sustainability and the progress we have made towards achieving our ambitious goals, we refer to our Sustainability Report 2021.

# QUALITY, HEALTH, SAFETY & ENVIRONMENT

As part of the overall vision to create the safest working environment possible, DEME aims to focus on things that are going right and continuous improvement, based on its QHSE performance reports and available data. In 2021, five targeted initiatives were carried out by the QHSE team in line with this.

## NEW YEAR'S RESOLUTION

The year began with the 'New Year's Resolution'. This is when previous safety topics are reiterated to refresh people's memory, and it included a specific focus on checking Personal Protective Equipment (PPE) and DEME's well-known 'Licence to Stop' work authority. Employees were asked to check the condition of their PPE such as helmets and lifejackets, and the campaign emphasised that everyone has the authority to immediately stop the work if they consider something unsafe.

## FLORA & FAUNA

Continuing a two-year environmental campaign, the team encouraged employees to always consider the impact of DEME's activities on the environment and minimise any potential impact as much as possible. And importantly, the QHSE team wanted to stress that environmental impact is more than only careful waste management, for example it could be about reducing energy consumption, limiting the use of natural resources or monitoring for marine mammals when offshore piling is taking place.

## SAFETY STAND-DOWN

A Safety Stand-Down Day was held in April which focused on four incidents. Launched by DEME's CEO Luc Vandenbulcke, the event had very high participation levels with more than 4,000 people involved worldwide in offices, on project sites and vessels. Additionally, more than 500 Team Leaders and Captains attended two live briefing events.

DEME's goal is always to have everyone returning safely home again from work. The Stand-Down really served as a 'wake-up call' because the four incidents occurred during regular activities. During the videos about the incidents, everyone

was asked to stay vigilant, to look out for each other, and the importance of the safety tools 'Take 5' (when employees are asked to take five minutes to carry out a short risk analysis) and the 'Licence to Stop' was again highlighted.

## SAFETY WEEK

Safety Week is an annual initiative where High Potential (HIPO) incidents – those that have the potential to go wrong or could have a worse outcome – are examined and explained in detail. In 2021, there was a focus on 'being in the line of fire' which means being in the danger zone. One example highlighted was to avoid standing in a place of danger close to mooring lines, just in case one snaps. First thing in the morning these HIPO incidents were discussed while viewing videos explaining the potential dangers.

## SAFETY SUCCESS STORIES

Following the Safety Week, everyone was asked to share Safety Success Stories too. Via a special app, DEME colleagues could upload their stories and share their knowledge and tips about specific initiatives they have taken to make sure the working environment is as safe as possible.

There was a tremendous response, with around 215 Success Stories submitted. The QHSE team reviewed every one and chose eight to present at the **Safety Moment Day** in December. But lessons learnt from all of these Success Stories are taken on board by the QHSE team and developed further. For example, one initiative, which was initially inspired by an employee's Safety Success Story, related to the potential danger of open manholes on deck. Now all manholes are safely covered.



## ISO 50001 ENERGY MANAGEMENT SYSTEMS

DEME is proud to be one of the first companies in the industry to get accredited for ISO 50001 Energy Management Systems. Lloyd's Register performed numerous audits on our entities, vessels and project sites during the last quarter of the year. This Energy Management System is helping us to continuously improve and to achieve more sustainable performances.

The numerous campaigns and our successful ISO 50001 accreditation demonstrates how we manage our QHSE performances. Our employees are highly engaged and we are continually vigilant. DEME aims to create the safest working environment possible and we are all working together to achieve this every day. 🌱

You can find more information about our Quality, Health, Safety and Environment (QHSE) efforts in our Sustainability and QHSE Report.

# INNOVATION

**Ongoing efforts to stimulate an innovative, entrepreneurial culture throughout the company, allow DEME to continuously improve and anticipate developments in the market.**

## DEME DIVER CAMPAIGN

Following a very successful 'Diver campaign' in 2020, whereby the DEME community contributed more than 600 innovative new ideas, 2021 has focused on developing the most promising ones by entering them into an Acceleration Programme. This makes sure that these innovative ideas get turned into reality and start creating value for the company as soon as possible.

The 'Green Diver' looked for new, promising ideas to address corporate challenges such as how we can reduce our carbon footprint and how we can make sure we achieve operational excellence. Then the 'Blue Diver' reviewed more than 200 achieved initiatives that have been realised in the past three years and selected the best in every category to win a prize.

Some of the highly promising ideas which have entered the Acceleration Programme include automated bow coupling for offshore applications. This is a system that allows our hopper dredgers to connect to floating pipelines and the Diver idea is to speed up the process, while making it as safe and efficient as possible. Currently a prototype is being developed.

Another idea being accelerated is the development of working with zero-emission equipment on our projects. A third initiative is to join the Elon Musk Starlink satellite internet constellation to improve internet connection on board our fleet. High potential incident training aboard our vessels is another idea being developed and also how best to share this information throughout the organisation.

One of the many initiatives concerning sustainability focuses on procurement and ensuring our subcontractors and suppliers are also working on improving their sustainability efforts such as the reduction of their own CO<sub>2</sub> emissions.

'DEME Talks' – based on TED Talks – provides a great example of the success of these initiatives that have been developed since the Diver campaign in 2017. Just recently, the DEME Talks, which often take place during lunchtimes and switch between technical and non-technical topics, had a record number of participants from all over the world.

## TECHNOLOGY ANTENNA

In addition to innovation campaigns, the DEME Technology Antenna is our way of scouting for technological developments. This centralised location collects and shares all the information from our 'internal technology scouts', emerging technologies, interesting companies, university reports, etc. in a transparent way. Our 'scouts' keep a keen eye out for novel technology and feed this information into DEME, enabling us to spot new trends and introduce them into the organisation more quickly.

## WINNERS OF 'CO-CREATING OUR FUTURE' CAMPAIGN ARE AWARDED DRONES FOR THEIR VESSELS

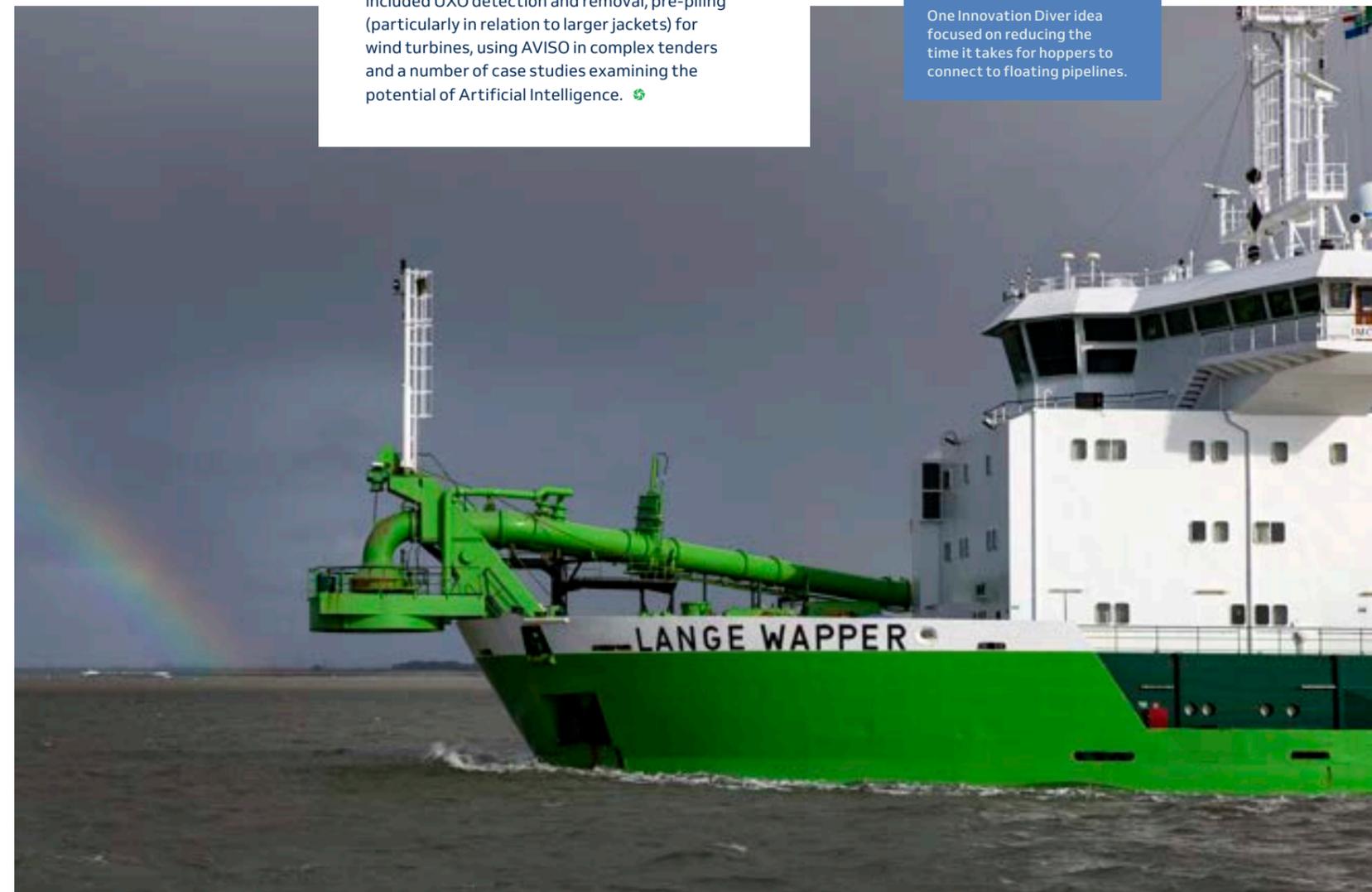
Alongside the DEME Divers, we also organise the 'Co-creating our future' innovation campaign for our vessels and project sites. The last edition - 'Loads of ideas' - targeted our crew. This looked for innovative ideas that can help improve our current fleet's productivity.

The vessels with the highest rates of participation were awarded with a drone for their vessel, which can be used to carry out inspections and of course, for some wonderful photography. The prize also included drone training.

## TARGETED AVISO CAMPAIGNS

Continuing with our dedicated 'AVISO' campaigns, which focus on specific tenders, challenges or vessels, we launched several initiatives. Topics included UXO detection and removal, pre-piling (particularly in relation to larger jackets) for wind turbines, using AVISO in complex tenders and a number of case studies examining the potential of Artificial Intelligence. 🌱

One Innovation Diver idea focused on reducing the time it takes for hoppers to connect to floating pipelines.



# FLEET INVESTMENT



The efficiency of 'Spartacus' is already showing some impressive results with high production levels.

## WORLD'S MOST POWERFUL CUTTER SUCTION DREDGER 'SPARTACUS' JOINS THE FLEET

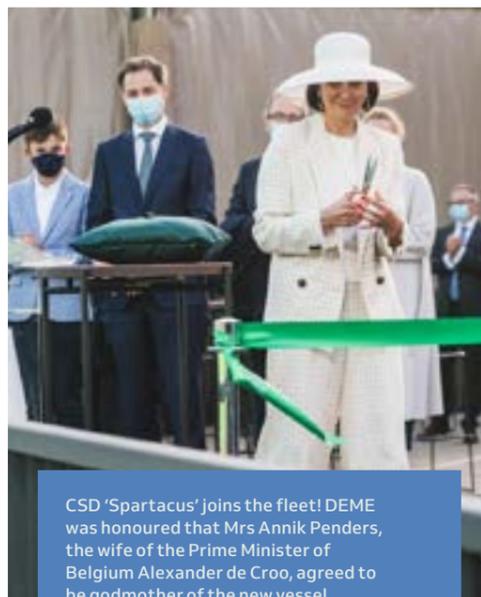
After delivery of the new mega cutter suction dredger (CSD) 'Spartacus' in August from the Royal IHC shipyard, the vessel went directly to her first project under own keel and powered by LNG. This exceptional vessel, the largest CSD in the world, started work on an equally exceptional project – Abu Qir 2 in Egypt – the biggest dredging and land reclamation project in DEME's history.

The efficiency of this powerful mega dredger is already showing some impressive results with high production levels, coupled with a substantial reduction in fuel consumption per unit of work. Being more productive, while using less energy fits in with our vision for a future-proof, sustainable fleet.

With a total installed power of 44,180 kW and 12,000 kW on the cutterhead, 'Spartacus' is more powerful and has more cutting power than any other CSD in the market. It can dredge up to an exceptional -45 m rather than the usual -35 m, and has unprecedented autonomy and pumping distance, having the ability to pump 15-20 km ashore at high flow rates.

Several innovative features have been introduced to reduce emissions and make the vessel as energy efficient as possible. As well as being equipped with dual fuel engines, enabling the operator to choose the cleanest fuel available, the vessel is equipped with an installation to recover waste heat from the engine exhausts, generate steam and convert this by means of a steam turbine into up to 2,000 kW of electrical power. Additionally, a cold recovery system that cools down the living quarters by draining heat to evaporate LNG reduces the electrical power consumption on board. But despite its size, 'Spartacus' is somewhat of a 'gentle giant'. A range of measures have been introduced to reduce noise and vibrations on board, making a huge difference to crew comfort.

We are confident 'Spartacus' will live up to the industry's expectations after seeing the vessel in action in Abu Qir. The mega CSD's workability in sea states is unrivalled. 'Spartacus' is groundbreaking in every sense.



CSD 'Spartacus' joins the fleet! DEME was honoured that Mrs Annik Penders, the wife of the Prime Minister of Belgium Alexander de Croo, agreed to be godmother of the new vessel.



Service Operation Vessel 'Groenewind' is equipped with a motion compensated gangway, which enables the technicians to safely transfer to the turbines.

### NEW SERVICE OPERATION VESSEL 'GROENEWIND' ENTERS THE FLEET AND IMMEDIATELY HEADS TO FIRST PROJECT

DEME's first ever Service Operation Vessel (SOV), 'Groenewind', was delivered in June and just a few weeks later she was successfully deployed on her first project. 'Groenewind' has been delivered at the CEMRE shipyard in Yalova, Turkey, on time and on budget.

Since starting work at the Rentel and SeaMade offshore wind farms in Belgium, the vessel's performance has been amazing, even in high sea states.

The Small Waterplane Area Twin Hull (SWATH), DP2 SOV is the first of its kind in the world. She provides exceptional comfort for the technicians on board because the SWATH design dramatically reduces motions, providing a very stable working platform. 'Groenewind' easily competes with large monohull vessels, consuming much less fuel (up to 50%) and the vessel is also half the construction weight, making it much more sustainable. Additionally, the 60 m vessel is equipped with a motion compensated gangway, which enables the technicians to safely transfer to the turbines.



The revolutionary offshore installation vessel 'Orion' is again equipped with its 5,000-tonne crane.

### OFFSHORE INSTALLATION VESSEL 'ORION'

The revolutionary, new offshore installation vessel 'Orion' has joined the fleet and is again equipped with its 5,000-tonne crane. When pioneering, and introducing vessels to the market that have never been seen before, there are occasionally challenges to overcome. As is well documented, there was an accident involving the crane hook during overload tests at the Liebherr manufacturing facility in May, 2020, before DEME could take ownership of 'Orion'.

'Orion' is able to handle the enormous turbines and foundations of the future and in line with this, it will also be equipped with an integrated motion compensated pile gripper. The pile gripper is future-proof, built to handle the largest monopiles. The tool also enables the crew to upend the monopiles, which are transported horizontally on deck. This technology, coupled with the vessel's DP3 capability, will enable the monopiles to remain vertical and stable, despite motions and waves.

When entering the offshore wind industry, 'Orion' is the first floating monohulled vessel in the offshore wind industry to perform these monopile installation operations, speeding up installation times dramatically.

With a total installed power of 44,180 kW and at 216.5 m long, the vessel has a huge, unobstructed deck and a deadweight that has been maximised so she can handle the heaviest monopiles, jackets and wind turbine components.

Sustainability considerations are a vital part of the vessel's design. 'Orion' has dual fuel engines enabling it 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 to electrical energy. The evaporation of LNG also cools the accommodation with a cold recovery system.

### PIONEERING DP3 INSTALLATION VESSEL 'GREEN JADE' TAKING SHAPE

The pioneering new offshore installation vessel 'Green Jade' is taking shape. 'Green Jade' will feature an exceptional combination of high transport and load capacity, impressive lifting heights and green technology. Equipped with a 4,000-tonne crane, the new vessel is perfectly suited for the transport and installation of the next generation of offshore wind farm foundations and turbines. The vessel will be deployed by CSBC-DEME Wind Engineering (CDWE). 'Green Jade' will sail under the Taiwanese flag and be crewed by Taiwanese nationals. With the ambitious offshore wind targets in Taiwan, the vessel already has her first wind farm projects lined up.

### TWO MAJOR CONVERSIONS AS DEME PREPARES FOR NEXT GENERATION OF OFFSHORE WIND TURBINES

DEME's DP2 jack-up installation vessels 'Sea Installer' and 'Sea Challenger' will both undergo a major crane upgrade, when their capacity is increased to 1,600 tonnes, enabling them to handle the next generation of mega wind turbines.

The upgraded 'Sea Installer' is due to be deployed for the first time at the 800 MW Vineyard Wind 1 project, one of the first large-scale wind farms in the US. Vineyard Wind 1 will feature 62, GE Haliade-X offshore turbines, which have a 220 m rotor, 107 m blades and will be a staggering 248 m high.

Then in a further vote of confidence in the Japanese market, the DP2 jack-up installation vessel 'Sea Challenger' will be brought under the Japanese flag and operated by Japan Offshore Marine (JOM), a cooperation between DEME Offshore and Penta-Ocean Construction Co., Ltd., Japan's leading marine contractor. The investment in a crane upgrade will ensure the company is ready for the future and to become an offshore wind industry leader in the Japanese market.



Offshore installation vessel 'Green Jade' has her first wind farm projects lined up in Taiwan.

### MAJOR REFURBISHMENT OF 'PEARL RIVER'

In a strong sign showing our confidence in the future, we have carried out a major refurbishment of our trailing suction hopper dredger 'Pearl River'. This represents one of the largest ship refurbishments in our history and is in addition to our multi-year, newbuild fleet investment programme.

Built in 1994 and a firm favourite with our crew, 'Pearl River' has been a real workhorse of the fleet over the years and had suffered quite some wear and tear. But rather than retire the vessel we decided to make a substantial investment, which has given the TSHD at least another 10 years of productive life.

The main improvements made to the vessel were the addition of a bow thruster, making it much better at manoeuvring, and this was coupled with a complete overhaul of the engines and the gearboxes. Additionally, approximately 275 tonnes of steel was renewed, including all the bottom doors and frames, making the TSHD much stronger. New dredge computers were also installed on the bridge and the accommodation has been modernised. 🌱



The modernisation of the TSHD 'Pearl River' represents one of the largest ship refurbishments in DEME's history.

# STRUCTURED FINANCE & TREASURY

The Structured Finance & Treasury team has been busy assisting customers and supporting the DEME Group itself during 2021. An important part of its work over the past year has been transforming existing, long-term loans into sustainability linked financing.

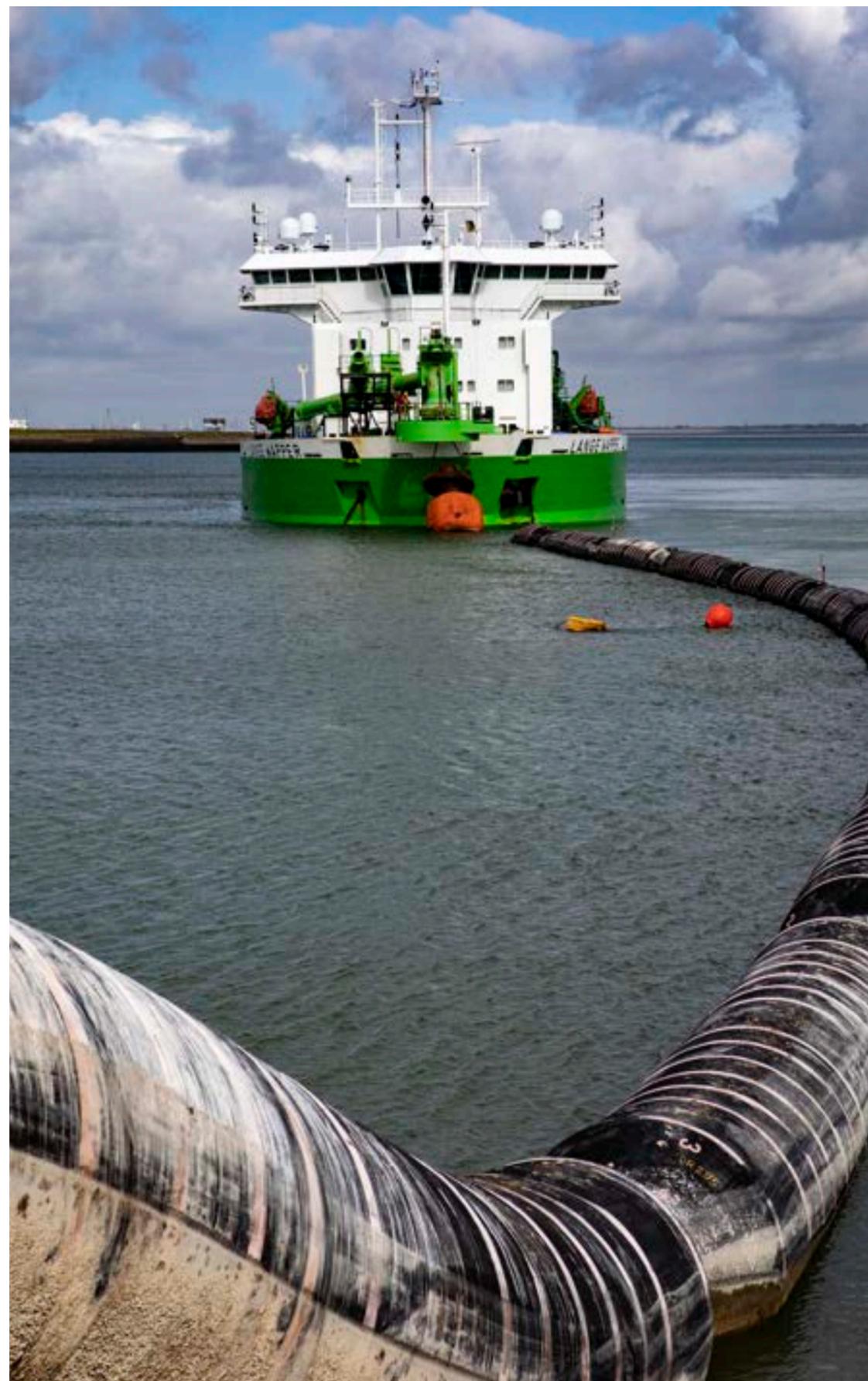
## FINANCING PACKAGES FOR CUSTOMERS

The team specialises in organising tailor-made financing packages for DEME's customers and they then negotiate these with investors, financial institutions and authorities. Each package is adapted to the customer's exact requirements and the packages can include buyer's credits, soft loans, structures allowing customers to defer payments, or a combination. Customers benefit knowing they have a safe, competitive and transparent payment solution which is unavailable to them in their home market.

All of DEME's financing packages are fully compliant with the OECD Guidelines. DEME works with a broad range of financial institutions and in the home market DEME has a long-standing relationship with Credendo, the Belgian Export Credit Agency (ECA).

## SUSTAINABILITY LINKED FINANCING

With a view to achieving DEME's ambitious sustainability goals, the team has been transforming existing, long-term loans which finance capital expenditure, into sustainability linked financing packages. These are directly linked to low carbon fuel and safety KPIs. These KPIs will trigger adjustments on the interest margins applied to the long-term loans. DEME wants to underline to its stakeholders that the company is committed to sustainability in all aspects of its business.



## INCOMING/OUTGOING SECURITIES SYSTEM

As part of the finance technology transformation journey, the team has implemented a new system for incoming and outgoing securities. The system enables better visibility and central control over DEME's securities portfolio, as well as digitalising processes.

## TRIGGER PROJECT – NEW TREASURY MANAGEMENT SOLUTION INTRODUCED

To address multiple, complex challenges, DEME's Treasury department embarked on a major project that continued during the year and included introducing a new treasury management solution, adopting a payment hub, integrating a sanction screening service and rationalising the Group's entities' banking landscape.

The goals of the so-called TRIGGER project included adopting secure bank communication channels, standardising payment formats, increasing automation, and adopting a universal workflow tool to track payments. This new system makes sure the Treasury department is future-proof, and supports DEME's entities across the globe with a single treasury and payment hub solution, which is very efficient and leads to substantial cost savings.

Suitable payment controls are enhanced and this in turn, reduces the risk of fraud and errors and makes it easier to carry out speedy reporting. By the end of the year 120 entities in 30 countries are now supported with one centralised treasury management system and payment hub solution. The system is designed to support business growth as new countries and businesses are added in the future.

DEME now knows that controls are in place, payments are made in a compliant way, and no actions are being taken without the correct approvals. Manual work involved in banking activities has been reduced drastically and the processing of paper bank statements has been replaced by the automated collection of digital statements. 🔄

# DRIVE

The positive results of DEME's continuous improvement programme, known as DRIVE, are clear in several major projects we have performed in 2021. During the year we launched approximately 350 DRIVE initiatives. Two exceptional projects are clear examples of productivity improvements we have achieved through the DRIVE programme: Sea Channel in the Arctic and Abu Qir 2 in Egypt.

## SEA CHANNEL IN THE ARCTIC

In the Sea Channel project – one of the most remote projects in our portfolio – we were dredging the access channel to Sabetta port, where a liquefied natural gas facility is being developed. In the 2021 campaign we mobilised eight large hopper dredgers, though overall there were some 20 vessels involved.

Through a DRIVE exercise and by preparing well in advance, we set out with the aim of optimising the dredging production and decided to deploy two extra-large ploughs. Specifically built by DEME for the Sea Channel project, these ploughs flattened out the high spots and this was over an enormous area of 25 million m<sup>2</sup>. This campaign was completed without a single high spot left in the dredged area. Despite being in challenging conditions, we even finished the project four weeks ahead of schedule and crucially, far ahead of the ice season. Additionally, there was much less overdredging, reducing the amount of material we handled by millions of tonnes.

## ABU QIR 2 IN EGYPT

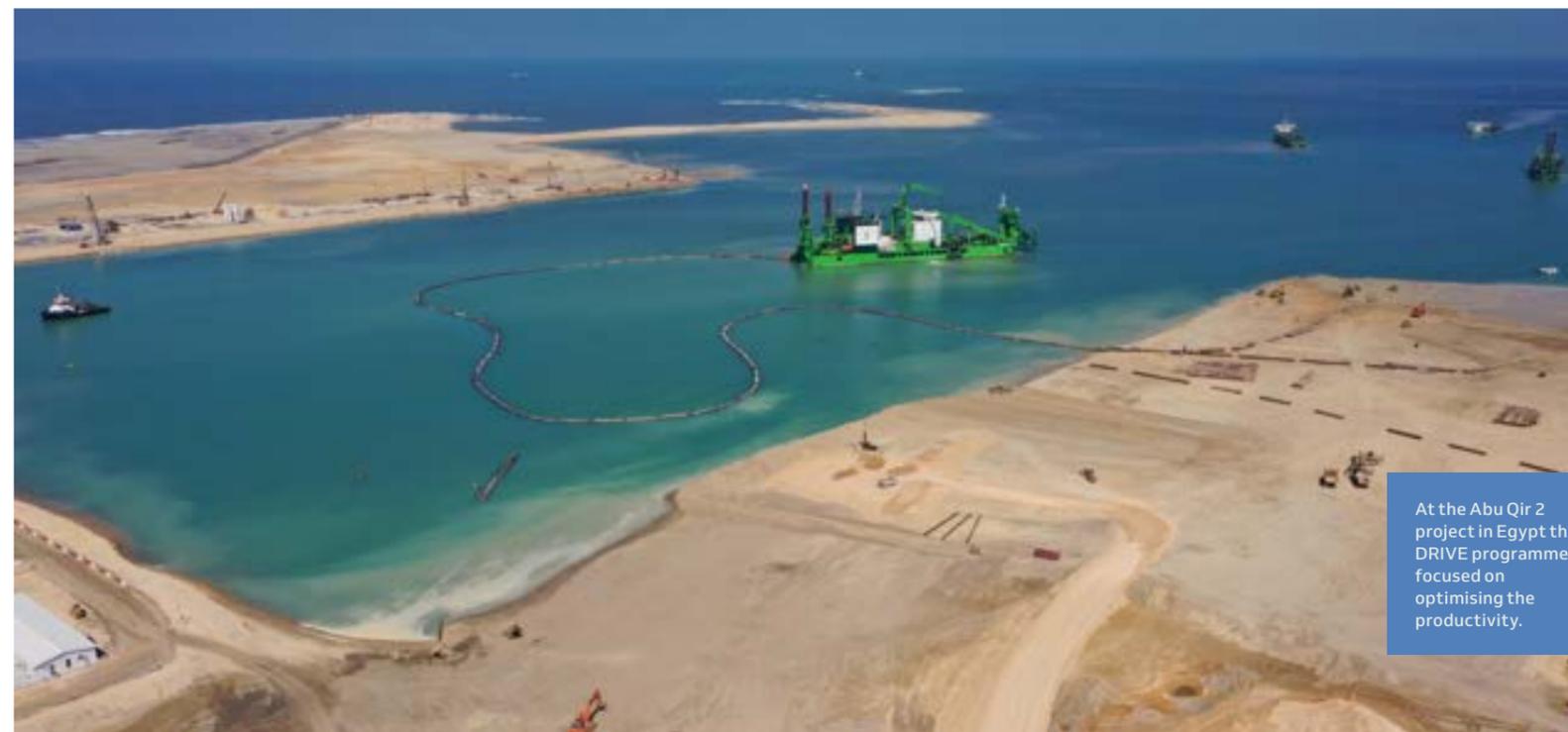
In Egypt, at the Abu Qir 2 project, which is the largest dredging and land reclamation project in our history, we again have a large number of our fleet present – up to 10 dredgers at peak times – including our new mega cutter 'Spartacus'. Here, we focused on optimising the productivity of our cutter, as well as for the project overall. Experts from our 'BOOS-T' team, who mainly focus on the continuous improvement process regarding our fleet, assist the vessels in achieving the DRIVE goals. The experts were embedded in the project team of Abu Qir and looked at ways of optimising the core production. All the initiatives meant that production was improved, again saving many weeks in the schedule.

## OPTIMISING FOUNDATION INSTALLATION & CABLE-LAYING PROCESSES

Meanwhile, in our offshore activities our DRIVE programme focused on optimising foundation installation at wind farms and our cable-laying processes when laying and burying cables. We performed a thorough production analysis of each part of the process seeing where we could make gains. For example, when we are spooling cables at manufacturing locations we worked with the cable fabricators to see if we can jointly speed up the process. 🔄



A thorough production analysis of the foundation installation process was executed.



At the Abu Qir 2 project in Egypt the DRIVE programme focused on optimising the productivity.



# 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, as defined in the DEME Code of Ethics and Business Integrity for Business Partners.

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.

# 50

## DREDGING



Dredging is more than just one of our core activities. It is 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 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 areas, roads, bridges etc. on all continents.

# EUROPE



## BELGIUM

### OOSTERWEEL LINK

Preparation works for the Oosterweel link project are in full swing, including the engineering and permitting for the construction of a new drydock in Zeebrugge for the immersed tunnel elements. In June 2020, DEME was awarded this prestigious project, which will ultimately complete the famous Antwerp Ring Road.

As a member of the 'Tijdelijke Maatschap Combinatie Oosterweeltunnel' (TM COTU), DEME will construct the Scheldt tunnel for project developer LANTIS. Known as the jewel in the crown of this crucial infrastructure project, the Scheldt tunnel will be the most important connecting element in the Oosterweel link and closes the Antwerp Ring Road on the north side.

Eight tunnel elements of approximately 60,000 tonnes each will be built in the inner port of Zeebrugge after which these will be towed to Antwerp, where they will be immersed in a pre-dredged trench in the River Scheldt.

The tunnel, which is virtually on the doorstep of DEME's HQ, has a total length of 1,900 m. We are responsible for the dredging and dry earthmoving works together with one of the joint venture partners.

### RIVER SCHELDT AND BELGIAN COAST

In November, following a public tender, DEME was awarded another long-term maintenance contract for the River Scheldt and Belgian coast, together with a joint venture partner. Under this contract, the dredging companies were scored on their ability to deploy both technically advanced vessels as well as vessels which are equipped with environmental technologies. DEME's trailing suction hopper dredger 'Scheldt River' will be utilised because it has dual fuel engines and can operate in LNG mode.

#### BELGIUM

DEME was awarded the long-term maintenance contract for the River Scheldt and Belgian coast.

### HEDWIGE PROSPERPOLDER

In a project to restore a floodplain and an estuarine natural intertidal area along the River Scheldt on the Belgian-Dutch border, work has progressed smoothly and at the end of the year DEME was even ahead of schedule at the Hedwige Prosperpolder.

As part of a consortium, DEME was awarded a five-year contract from De Vlaamse Waterweg (the Flemish waterways authority) for the dry earthmoving works and in 2021, DEME completed a new primary dyke. In 2022 the team will start breaking down the existing dyke, enabling the river to flow into the intertidal area, effectively returning the land back to the water.

### LOSVAL 1B2

In September and on schedule, DEME concluded 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. The team handled around 1.13 million m<sup>3</sup> of material.

### NEW CONTRACT IN THE PORT OF ANTWERP

For the same client, the Port of Antwerp authority, DEME won a new contract to remove a landfill site. This former landfill site will be transformed into a sustainable business park.

### MARINAS AND ACCESS CHANNELS IN OSTEND, ZEEBRUGGE AND BLANKENBERGE

In a long-term maintenance dredging campaign carried out by DEME's CSDs 'Vlaanderen XVI' and the electrically-powered 'Blanew', the team continued to dredge the marinas of Ostend, Zeebrugge and Blankenberge. 'Blanew' is directly connected to the shore-based renewable electricity network. Here, DEME uses the material dredged in the access channel to the marina to replenish the foreshore at Blankenberge.

### NIUWPOORT MARINA

In 2021, DEME focused on the permitting process and the detailed engineering for the construction of a new marina in Nieuwpoort. Performed by a consortium, DEME is responsible for the dredging and dry earthmoving works.

Nieuwpoort Marina, with 2,000 berths, is already a huge harbour, but there is a strong demand for larger berths. Therefore an additional dock with a deeper draught is needed. Eventually the development will create a new district with 1,000 apartments and 600 extra berths.

### KNOKKE

DEME supplied sand to stabilise the foreshore of Knokke from another one of its projects. The surplus sand was transported from the New Lock Terneuzen project by DEME's split hopper barges 'Pagadder' and 'Sloeber' and spread over the foreshore.

### BREAKWATERS IN BELGIUM

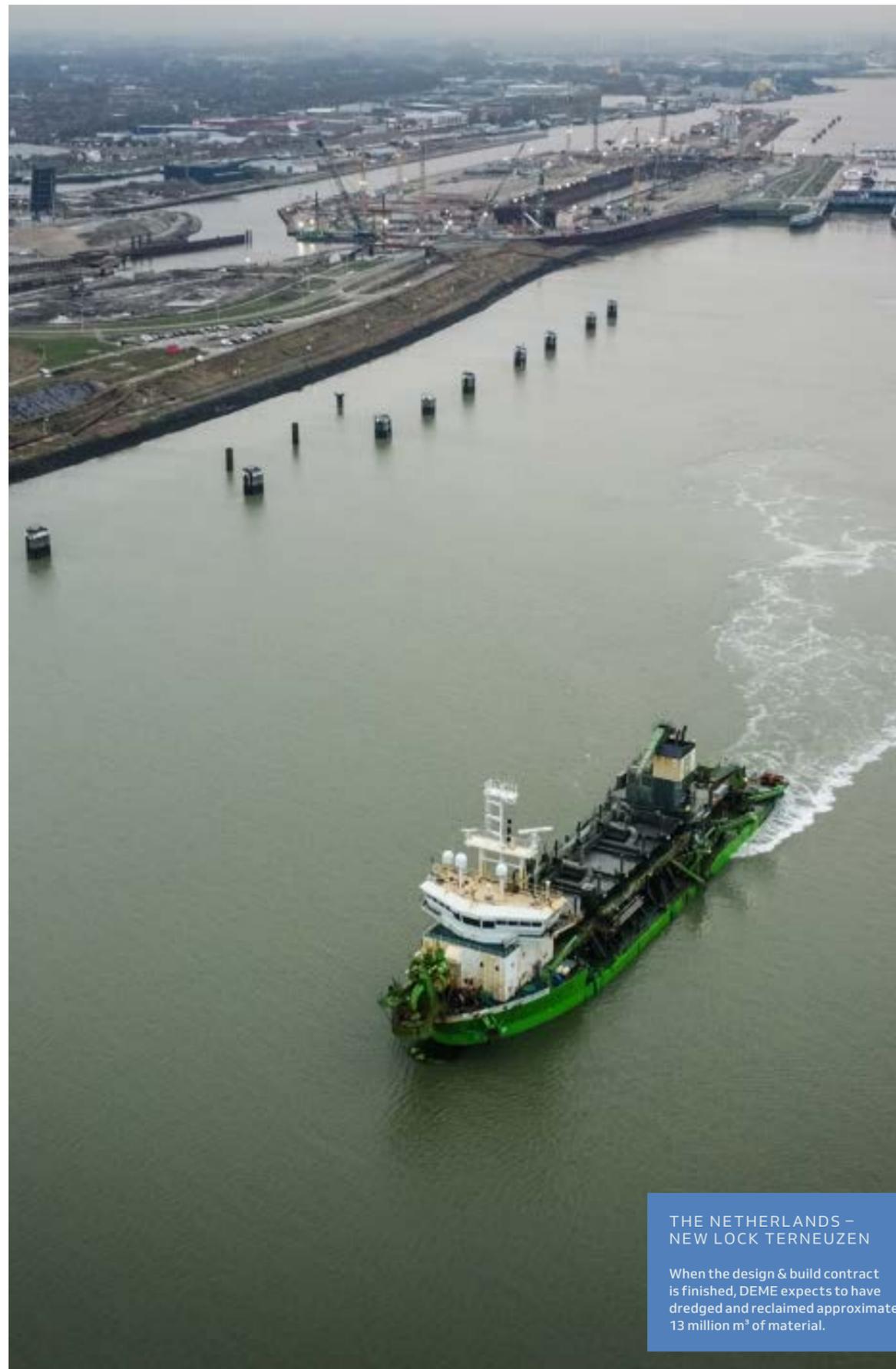
In October, DEME started works on an extensive breakwater improvement programme along the Belgian coast to prevent further erosion. The DEME team removed four existing groynes and construct new ones, which are both longer and higher. The work was challenging because it was being carried out in the middle of winter. This refurbishment project is expected to take two years to complete. In another project on behalf of the Flemish government agency MDK, DEME will also perform two beach replenishment contracts in the same area, near De Haan.

### PORT OF ZEEBRUGGE

A 'sweep' contract for the Port of Zeebrugge was carried out, whereby the DEME team leveled out the high spots in front of the quay wall with a deep-water plough, enabling the port to maintain the draught for the latest generation of container vessels.

### PORT OF ANTWERP 5<sup>TH</sup> HARBOUR DOCK

DEME has been awarded a contract from the Port of Antwerp authority to deepen the northern quay wall over a section of 1.4 km. The deepening works, whereby DEME will dredge a further 3.5 m will take the depth to 11.33 m, making the quay accessible for deeper draught vessels. Our civil partner has already started preparations but DEME will begin its scope in 2022.



#### THE NETHERLANDS – NEW LOCK TERNEUZEN

When the design & build contract is finished, DEME expects to have dredged and reclaimed approximately 13 million m<sup>3</sup> of material.

## THE NETHERLANDS

### RIJNLANDROUTE

By the end of the year, all the dry earthmoving works had been wrapped up at the RijnlandRoute. The RijnlandRoute is a new road running between Katwijk and Leiden (a connection between the A4 and A44).

### NEW LOCK TERNEUZEN

Several key milestones were achieved at the New Lock Terneuzen, including the excavation of both lock heads and the lock chamber.

DEME's engineers have developed dedicated equipment specifically for this project such as a purpose-built pontoon 'Impérieuse' to excavate very stiff clay out of the future outer and inner lock heads. Another pontoon, 'Pebbles', was designed to disperse an even gravel bed on the bottom of the lock heads. This vessel is able to carry out very precise dredging works to ensure that the required tolerances are adhered to.

Then for the outer harbour, the backhoe dredger 'Samson' was deployed for the excavations and part of the reusable sand (about 135,000 m<sup>3</sup>) was used to replenish the beach at Knokke.

Additionally, a significant part of the bank and scour protection works were completed, which covered about 100,000 m<sup>2</sup> and required the installation of 85,000 tonnes of rock. In 2022, work will further ramp up for the next phase of the project, with the addition of several backhoes and cutter suction dredgers.

When the design & build contract is finished, DEME expects to have dredged and reclaimed approximately 13 million m<sup>3</sup> of material.

The 427-metre-long New Lock Terneuzen is being built between the existing locks and is designed to improve access to the ports of Ghent and Terneuzen.

### BLANKENBURG CONNECTION

Dry earthmoving works continued apace at the Blankenburg Connection project, including excavating the construction pits for the tunnel elements. Preparations for the immersed tunnel's dredging works also got underway.

Earthmoving works in 2021 represented volumes of 0.8 million m<sup>3</sup>.

A major part of the project is to construct an 825 m immersed tunnel (the Maasdeltatunnel). 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, an immersed tunnel, a deepened connection to the A20 road and a high connection to the A15. Rijkswaterstaat (part of the Dutch Ministry of Infrastructure and Water Management) awarded the public-private partnership project 'A24 Blankenburg Connection' to the BAAK Consortium, which comprises DEME Concessions, Ballast Nedam Concessies and Macquarie Capital.



#### THE NETHERLANDS – MARKEN

The flood protection project aims to reinforce and build higher dykes on both the south and west side of the former Marken island.

### MARKEN ISLAND

In a prestigious project in the Netherlands, our subsidiary de Vries & van de Wiel has been awarded a major flood protection contract for the historic Marken island, following a public tender. The company is delighted to win this special project and to lead the joint venture. The scope will involve reinforcing and building higher dykes on both the south and west side of the island, which is a famous tourist destination. This represents around 6 km of dykes.

As most of the buildings are hundreds of years old, they are built on wooden piles and Marken has an icebreaking system in place, which prevents ice coming in from the IJsselmeer (IJssel lake). de Vries & van de Wiel will also have to construct a new icebreaking system, as the new dykes will be built outside of the existing ones.

Under the contract's requirements, the works are not allowed to disturb local residents or the thriving tourist industry. The company must maintain transparent and open communication about the project, so proper stakeholder management is vital.

In line with this, de Vries & van de Wiel has been asked to set up a test site in 2022 where it can demonstrate its innovative solution to tackle this complex project. The team will prepare a small section of the dyke to show the techniques being used.

This follows on from other dyke reinforcement projects awarded such as Gorinchem-Waardenburg and Lekdijk.

Design work was being carried out in 2021 and operations should get underway in 2023.

Once completed, the reinforcement works are expected to keep Marken safe and secure for the next 50 years and beyond.

### DYKE REINFORCEMENT GORINCHEM-WAARDENBURG (GoWa)

In June, de Vries & van de Wiel and its joint venture partners started operational works at the 'Dyke reinforcement Gorinchem-Waardenburg' (GoWa) project.

This 23-km dyke reinforcement project is part of the Netherlands Flood Protection Programme (Hoogwaterbeschermingsprogramma). Waterschap Rivierenland (the client) tendered using a new contract form, known as an Alliance. The partners of the Alliance work together right from the planning study, designing and costing the project, including risk sharing.

In July, the team was already being put through its paces, following flooding in Valkenburg, which led to flooding further downstream near the project's location. The Alliance, including de Vries & van de Wiel, demonstrated its expertise and worked with Waterschap Rivierenland to make sure everything was safe and secure. This highlights how crucial these projects are, as flooding becomes more commonplace due to climate change.

The Flood Protection Programme involves the reinforcement of 1,300 km of dykes and 500 locks and pumping stations throughout the Netherlands over the next 30 years.

## DYKE REINFORCEMENT OF LEKDIJK

As part of the Netherlands Flood Protection Programme, the Lek Ensemble Combination, including de Vries & van de Wiel, has also been awarded a so-called Innovation Partnership contract. Under the contract, the Dutch government has selected three parties which will work together to achieve six projects related to dyke reinforcement. These parties must design the project whilst taking sustainability, innovation and cooperation into account.

Awarded by Hoogheemraadschap De Stichtse Rijnlanden (HDSR), the six projects concern the reinforcement of the northern Lekdijk, located between Schoonhoven and Amerongen, over a total length of approximately 55 km. The Lek Ensemble Combination was awarded the Wijk bij Duurstede-Amerongen section. If the planned performance is met, a second project will be assigned.

In 2021, the team has been further detailing the project plan and budget and they are currently working on the design, stakeholder management and environmental permits. In line with its ambitions to innovate and be as sustainable as possible, the consortium is looking to work with electric equipment such as electric bulldozers and cranes.

## FOUNDATION 'EMISSION-FREE NETWORK INFRA'

To successfully achieve these projects, the consortium has initiated the Emission-free Network Infrastructure (ENI) foundation. This brings a network of infrastructure specialists together where knowledge can be shared, making it possible to achieve zero emissions as quickly as possible. Currently, members include Volvo, Hyundai, Rijkswaterstaat (the Directorate-General for Public Works and Water Management) and TNO amongst others.

## RIVERS IN THE WEST OF THE NETHERLANDS

A maintenance dredging programme for rivers in the west of the Netherlands near Dordrecht and Rotterdam was extended for 2022. The hopper dredger 'Zeeland' is being deployed and approximately 300,000 m<sup>3</sup> is dredged per year.

For these maintenance dredging projects, we apply in-house predictive tools, which are based on years of experience. Over the decades, de Vries & van de Wiel has built up an enormous dataset, which enables our experts to predict changes in water levels.

## IJBURG (AMSTERDAM)

The prestigious Iburg project in Amsterdam, which created a new island, was successfully completed in November. In a joint venture, 100 ha of land was reclaimed which will be used for residential and recreational purposes. The whole project, which kicked off in 2018, represents dredged volumes of around 12 million m<sup>3</sup> of material. As well as several beaches, a special nature area was created which is earmarked for oyster beds. Some 8,000 houses are being constructed under the first phase.

Selective catalytic reduction equipment was also installed on the fleet deployed on this project to reduce emissions, and in particular to reduce nitrogen oxide emissions.

## STRATEGIC SAND-WINNING CONCESSIONS

de Vries & van de Wiel has six sand-winning locations in the IJsselmeer, it can make use of. Longstanding agreements with the Directorate-General for Public Works and Water Management in the Netherlands enables the company to dredge good quality sand close to its customers' projects.

# GERMANY



## RIVER ELBE DEEPENING AND WIDENING

DEME successfully completed the historic, two-year River Elbe deepening and widening project well within the schedule. The project team was delighted that they delivered such a large-scale project to the client, which went smoothly from an operational perspective and, more crucial, from a safety perspective. Thanks to stringent measures in place, especially to combat COVID, the project has been successfully completed without any major disruption due to the pandemic.

The fairway adjustment of the Elbe is a project of the Federal Waterways and Shipping Administration. The river was deepened from Hamburg to the mouth of the Elbe and widened in some places to enable the new generations of container vessels to access the Port of Hamburg independently of the tides. Containerships with a draught of up to 13.50 m are able to reach the Port independently of the

tide, and even with a draught of up to 14.50 m on the tidal wave.

DEME completed the main dredging works in early 2021 and these were followed by a final campaign by DEME's backhoe dredger 'Samson', alongside our split hopper barges 'Sloeber' and 'Pagadder'. They removed boulders and smaller wrecks, and levelled the remaining clay ridges.

After the completion of the dredging operations, the benefits of the increased depth were immediately apparent. In May, the port authority announced that ULCCs could take advantage of the new navigation channel depth with a - although for now limited - draught increase. The 'CMA CGM Jacques Saadé' was the first containership of the Megamax class to utilise the Elbe's improved draught. This meant that the ship could bring around 1,000 more containers to Hamburg.

Some severe winter storms and very icy conditions could not be avoided, including the risks posed by floating ice. However, special toolbox talks were arranged so the crew could take appropriate measures to prevent any damage to the equipment.

DEME's TSHD 'Bonny River' was the last of the larger vessels to be deployed. But at peak times, three of the famous green dredgers were present. Ultimately the team dredged, transported and relocated a staggering 28 million m<sup>3</sup> of material and handed this important project over to a satisfied client.

In contrast to the previous deepening of the Elbe fairway, there is also an extensive river engineering concept in place to dampen the tidal energy, which in turn, prevents major changes in the flow and water levels.

### RIVER ELBE MAINTENANCE DREDGING

With several TSHDs, DEME also performed maintenance dredging along the River Elbe in 2021. One of DEME's newest hoppers 'Meuse River' was deployed, after successful interventions of the TSHDs 'Uilenspiegel' and 'Scheldt River'. During the year, another member of our fleet, the water injection dredger 'Dhamra', was busy tackling the areas where large TSHDs cannot reach so easily.

Then in May 2021, following the success of the previous maintenance project, DEME and its joint venture partner were awarded a new one-year maintenance contract for the Elbe.



GERMANY –  
RIVER ELBE

With several trailing suction hopper dredgers, DEME performed the maintenance dredging along the River Elbe.

## THE UK

### POOLE BAY BEACH MANAGEMENT WORKS

This beach replenishment of approximately 400,000 m<sup>3</sup> of sand is required every three to four years for both coastal protection and amenity benefits. The sand was won from a Crown Estate Area and from maintenance dredging of the nearby Swash Channel, the approach channel to Poole Harbour.

## POLAND

### ŚWINOUJŚCIE - SZCZECIN FAIRWAY

DEME and its joint venture partner had a very busy year at the Świnoujście - Szczecin fairway project and faced several complex challenges, particularly the presence of thick ice in the winter months and the largest UXO campaign in DEME's history.

The fairway provides access from the Baltic Sea, starting at the city of Świnoujście up to the Port of Szczecin, which is 66 km further inland. It had a depth of -10.5 m and has been deepened to -12.5 m, enabling the Port of Szczecin to handle much deeper draught vessels.

Despite the challenges, the team was firmly on track and on the verge of completing the two artificial islands in the lagoon by the end of the year, marking a major milestone. In line with DEME's sustainable solutions, these two islands (already named 'Bryśna' and 'Śmięcka') are created from dredged material and will become nature habitats.

Rock revetment works had just been finished off and two quay walls, as well as a jetty for hoppers, which will be deployed for maintenance dredging activities in the future, were being finalised. In addition, shrubs and trees were planted on the islands and their evolution will be carefully monitored in the years to come.

Given the remoteness of the islands and sometimes the related logistical challenges, the project team had a clever idea to establish a system for having fresh (potable) water on the islands at any time by installing a containerised freshwater treatment plant by tapping water from buffer (non-potable) water tanks.

In a further measure, DEME's TSHD 'Scheldt River' operated on LNG during the project, reducing emissions substantially. Other measures included the use of semi-electric bulldozers and solar panels on the offices.

In a final stage the joint venture team will carry out a survey along the 66 km channel, making sure there are no high spots left behind, before handing over to the client.



POLAND - ŚWINOUJŚCIE - SZCZECIN FAIRWAY  
Dredged material was used to create two artificial islands in the Szczecin Lagoon.



In line with DEME's focus on sustainability, the TSHD 'Scheldt River' operated on LNG during the project.



By the end of 2021, the two new islands were almost completed, marking a major milestone.

#### Remarkable safety record

This project also has a remarkable safety record, with more than 2.3 million LTI-free manhours. Additionally, the project team was nominated for the International Association of Dredging Companies (IADC) Safety Award because of its stringent health and safety measures, which saw the CSD 'Amazone' successfully mobilised at the very beginning of the pandemic, even though there were lockdowns in both Poland and Belgium.

#### UXO campaign – 60,000 objects

Following heavy bombardments in World War Two, it was crucial to perform an extensive UXO campaign. The initial survey campaign was carried out by DEME's specialist colleagues at G-tec and this alone took seven months to complete.

G-tec conducted most of the survey works for identifying potential UXO using an underwater towed set of magnetometers. In one of the largest UXO campaigns in DEME's history, nearly 60,000 objects were recovered and 2,000 of these were indeed UXOs. An unexploded 'Tallboy' bomb was amongst the discoveries. After a year of research and preparations, the Tallboy was safely detonated by the Polish Navy.

The DEME team is extremely proud to have accomplished this special project which creates land for the future. Eventually, 23 million m<sup>3</sup> was dredged in only one year. This success is largely thanks to fabulous relationships with our client, joint venture partner, the regional authorities and the local community.



#### FRANCE – PORT-LA NOUVELLE

The capital dredging for the access channel has been finalised, and we also won a new extension contract for the port.

## FRANCE

### PORT-LA NOUVELLE

The capital dredging project for the access channel to Port-La Nouvelle has been finalised, deploying DEME's TSHD 'Artevelde'. In addition, an old breakwater was successfully removed using a grab dredger. Approximately 1.9 million m<sup>3</sup> was dredged and the consortium team also built a 200 m quay wall, which is suitable for heavy loads such as wind turbines and floating foundations.

We have also won an extension contract for the French port in 2021. Representing expected volumes of 10 million m<sup>3</sup>, this contract includes four quay walls and two port extensions. Design work and soil investigations were taking place at the end of the year.

Port-La Nouvelle is being redeveloped and will include a strategic base for the offshore- and floating wind industry. As well as this, there will be new liquid and dry bulk terminals. The new port will be a real engine for the region's development. This important project really highlights DEME Group's ability to apply its engineering, dredging and infra expertise to support these initiatives, which ultimately drive economic growth. For DEME this project is particularly special because it directly fits into our vision of promoting sustainable energy growth.

### BREST

We have won a port extension contract for the so-called 'New Polder of Brest'. This is another development related to the growth of the offshore wind industry in France. We originally began dredging at the port in 2019 but there was a two-year delay for reasons outside of our control. DEME started work again in late 2021 and has mobilised its CSD 'Ganga'.

The team is carrying out a dredging campaign, whereby the silty, poor quality material is being placed in a reclamation area and this is being combined using consolidation and dewatering techniques. When the consolidation phase of the project is completed, the reclamation area will be transformed into a new port hub.

This project demonstrates how DEME is making every effort to come up with sustainable solutions. In the past this material would have been dumped offshore but now it is being turned into valuable material which can be used as the foundation for a new offshore wind terminal.

### DUNKERQUE, GRAVELINES AND GIRONDE

Several long-term maintenance contracts have been executed throughout France, which included Gravelines in the north of France, and Dunkerque, where we carried out dredging works for a new jetty. Meanwhile in Le Havre, DEME has won the 'Siemens Quay' project, which supports Siemens' new wind turbine production plant in the port area.

We are also responsible for a sediment management project addressing historical pollution in Dunkerque. The dredged material is taken to a dedicated area for dewatering and drying and then our customer can reuse this material for various projects – another example of the valorisation of dredging material.



#### FRANCE – BREST

The reclamation area will be transformed into a new port hub.

## ITALY

### LIVORNO

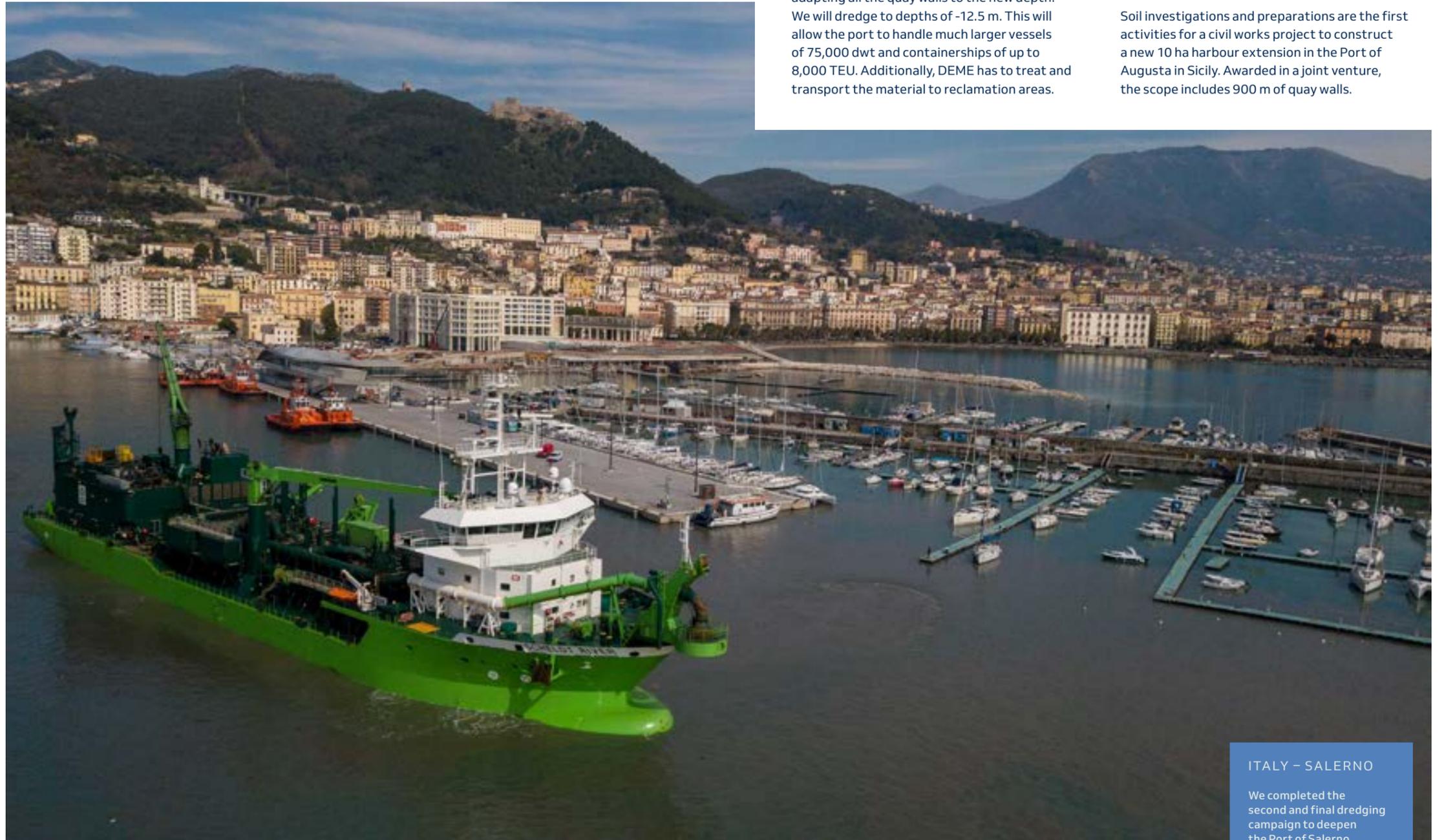
Right at the end of 2021 on December 31<sup>st</sup>, SIDRA, part of the DEME Group - as the leader of a joint venture with Italian partners - was very proud to land Phase 1 of the prestigious Piattaforma Europa (Europa Platform) project for a new container terminal in the Port of Livorno. In a strategic position in the Mediterranean, the Port of Livorno has embarked on a major expansion project, which will eventually encompass 3 km of docks, two large terminals, 2 million m<sup>2</sup> of new areas and a port entrance with depths of up to -20 m.

This development will see Livorno, which is already well-known for its container, forestry, new cars and ro-ro activities, become the port for Tuscany and Florence.

Our scope represents approximately 16 million m<sup>3</sup> of dredging volumes and additionally, the joint venture will construct 6 km of breakwaters.

### SALERNO

In this stunning site south of Naples, we completed the second and final dredging campaign to deepen the Port of Salerno at the beginning of the year. Representing more than 3 million m<sup>3</sup>, the project was finished off by our TSHD 'Congo River', but during the project execution four members of our fleet carried out the work. DEME performed the first phase of the dredging campaign in 2019.



#### ITALY – SALERNO

We completed the second and final dredging campaign to deepen the Port of Salerno.

### RAVENNA

After months of planning and preparations, the team mobilised to start work on the prestigious, multi-year design & build contract for the entire restructuring of the Port of Ravenna. This important project is being carried out in a joint venture with our Italian partner Consorzio Stabile Grandi Lavori.

DEME expects to handle volumes of approximately 5 million m<sup>3</sup> over the entire project which encompasses deepening the port and adapting all the quay walls to the new depth. We will dredge to depths of -12.5 m. This will allow the port to handle much larger vessels of 75,000 dwt and containerships of up to 8,000 TEU. Additionally, DEME has to treat and transport the material to reclamation areas.

### SICILY

We were awarded a new contract in Sicily to dredge the harbour and access channel to the port of Termini Imerese. The scope includes the transport to the offshore dumping sites.

Soil investigations and preparations are the first activities for a civil works project to construct a new 10 ha harbour extension in the Port of Augusta in Sicily. Awarded in a joint venture, the scope includes 900 m of quay walls.

## PORTUGAL - LEIXÕES

At the end of the year, our TSHD 'Meuse River' had just finalised the dredging works.



## PORTUGAL

### LEIXÕES

Underlining DEME's return to Portugal, the Southern European team is performing a great project in the country, this time in the Port of Leixões, near Porto. The scope to deepen and extend the port includes 2.9 million m<sup>3</sup> of dredging, of which 1.8 million m<sup>3</sup> is extremely hard rock material.

At the end of 2021, our TSHD 'Meuse River' had just finalised the dredging works whereby the vessel was removing the loose material and using the fine sand to replenish local beaches.

Phase 2 of this major project will start in 2022, when DEME's new cutter suction dredger 'Spartacus' arrives. This smart CSD is the most powerful in the world and its ability to cut hard rock is unrivalled. The vessel's capability to work in high sea states will also be tested, as the Leixões waters are subject to long ocean swells and can be very challenging conditions to operate in.

As part of this contract, our Portuguese partners will extend the Leixões breakwater by 300 m.

## EASTERN EUROPE



The project has been successful because of our disciplined organisation and planning.

## RUSSIA

### THE ARCTIC, SEA CHANNEL

We completed a second highly successful campaign for the 'Sea Channel' project in the Arctic – one of the remotest projects in our history. Once the ice had thawed, our fleet set out in July. We mobilised eight large hopper dredgers, including 'Uilenspiegel', 'Bonny River', 'Meuse River', 'Scheldt River', 'Pearl River' and 'Lange Wapper', and more than 20 vessels were eventually deployed at the project's location in Ob Bay. We dredged the access channel to Sabetta port, where a liquefied natural gas facility is being developed.

This time, our fleet was tasked with dredging an enormous area of 25 million m<sup>2</sup> or the equivalent of 5,000 football fields. These were handed over to our customer several weeks before the deadline.

### NOT ONE HIGH SPOT

This achievement was all the more impressive because this vast dredged area was delivered without a single high spot. A key factor in levelling out the high spots was our decision to deploy two enormous ploughing vessels, with ploughs of approximately 30 m long, which weighed 75 tonnes. Flattening out the high spots over such a huge surface area of 2,500 ha, has never been done before at such a large scale.

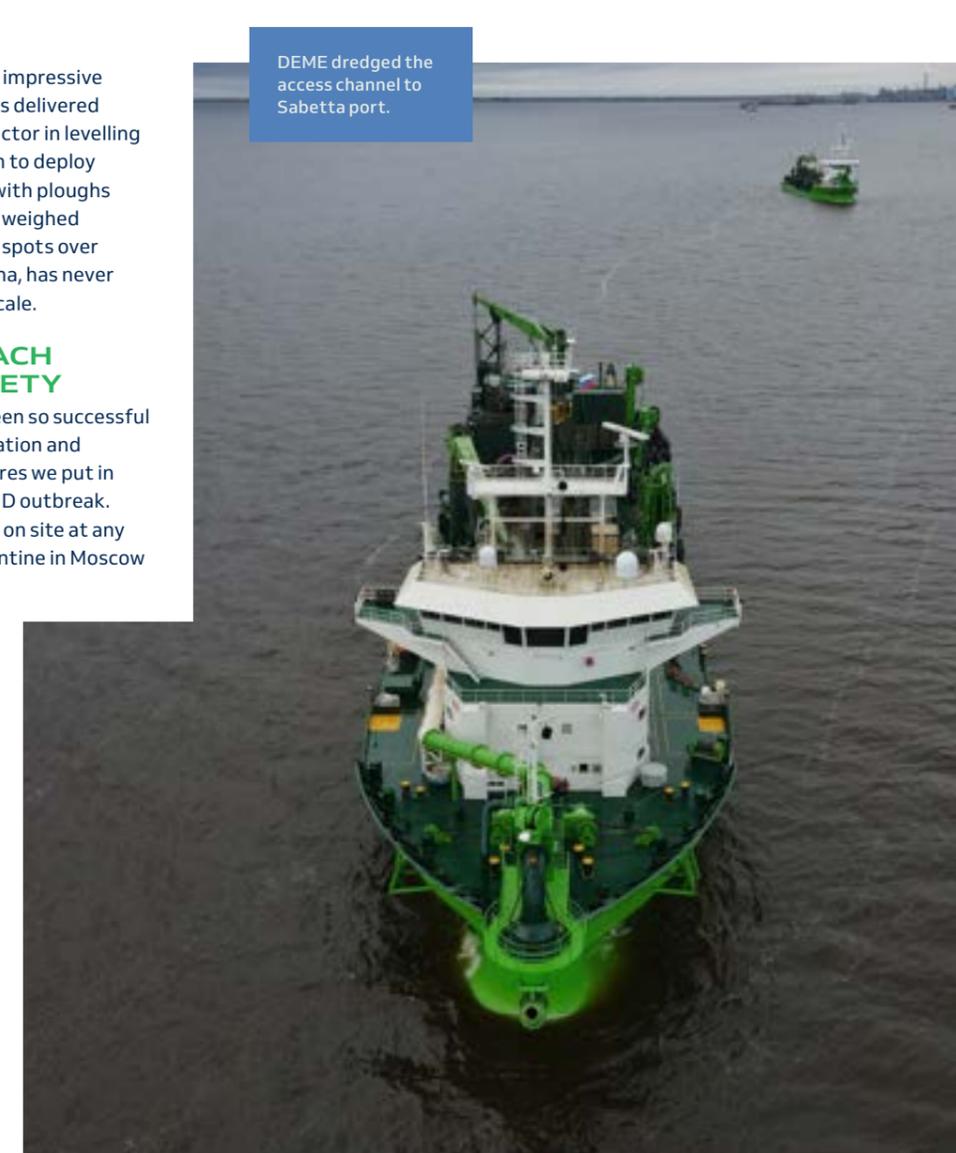
### DISCIPLINED APPROACH TO HEALTH AND SAFETY

Undoubtedly, the campaign has been so successful because of our disciplined organisation and planning, and the stringent measures we put in place to mitigate the risk of a COVID outbreak. Hundreds of our people – with 500 on site at any one time – had to first enter quarantine in Moscow

for two weeks before travelling on to the project location. We are very proud that our rigorous safety checks meant that the crew changes could go ahead as planned and indeed, there was not a single COVID case during the project.

The team members showed exceptional empathy for each other, ensuring the safety of their colleagues and everyone was disciplined, took responsibility, and pulled together to make sure their colleagues could return home safely. 🌱

DEME dredged the access channel to Sabetta port.



## AMERICAS



## BRAZIL

We return to Sepetiba Bay to carry out maintenance dredging works.

## BRAZIL

## SEPETIBA BAY

We will return to Sepetiba Bay following a contract award in December from Companhia Siderúrgica Nacional (CSN), one of the largest steel producers in Latin America. Our team is set to dredge around 1.7 million m<sup>3</sup> during the maintenance dredging works.

## COLOMBIA

## BUENAVENTURA

We concluded a successful maintenance campaign for three different clients in the Port of Buenaventura at the end of the year. For INVIAS, which is part of the Ministry of Transport, we performed maintenance dredging along the access channel to the port. Then in the inner port our vessel dredged in front of the private terminals of SPRBUN and COMPAS to maintain the required depth.

## PERU

## PORT OF CHANCAY

Working as a subcontractor for a local consortium, our TSHD 'Lange Wapper' was busy working on the first phase of the Port of Chancay, a new port being developed by Cosco Shipping. This is quite a difficult job because the port doesn't have a breakwater yet and also the soil conditions are challenging.

## URUGUAY AND ARGENTINA

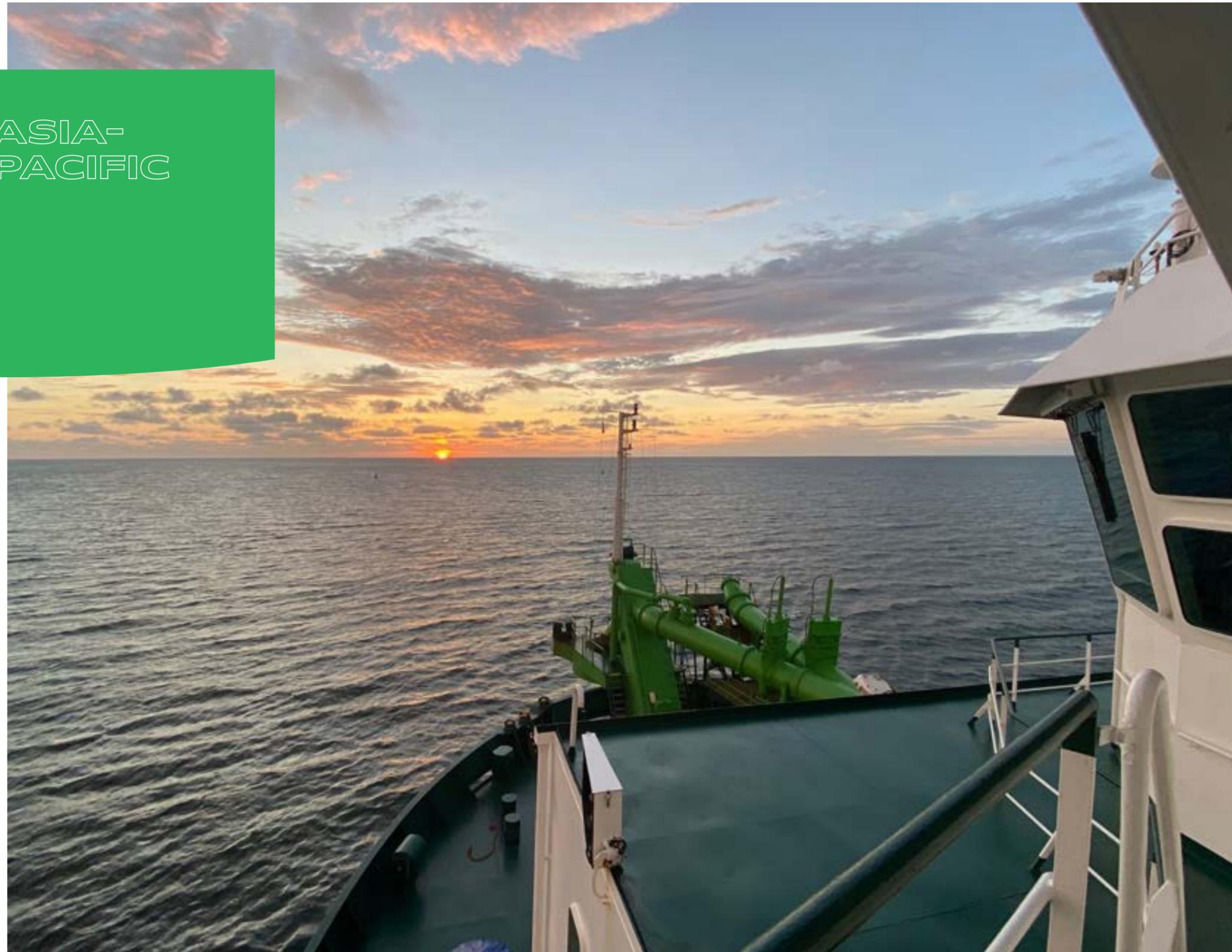
We returned to carry out the deepening and maintenance of the Canal Martín García. Under a five-year contract, which was awarded in a joint venture, TSHD 'Minerva' tackled the sedimentation in the Canal to keep it fully accessible. Approximately 4 million m<sup>3</sup> was dredged in 2021. Located between Uruguay and Argentina, the Canal is the main access channel to Uruguay's second largest port, Nueva Palmira, as well as to the Rio Uruguay. The main objective of the dredging programme is to maintain a depth of 10.4 m. In rocky areas this is 11.6 m. 🌱



## URUGUAY AND ARGENTINA

We carried out the deepening and maintenance of the Canal Martín García with our TSHD 'Minerva'.

## ASIA- PACIFIC



## INDIA

### JNPT, MUMBAI

A major new project to carry out the maintenance works for Jawaharlal Nehru Port Trust (JNPT) in Mumbai, India's largest container port, has been secured. Mobilisation got underway in October 2021, with works starting up in December 2021. Our TSHD 'Antigoon' and a water injection dredger have been mobilised and they are expected to complete the 16 million m<sup>3</sup> project in 2022. The contract also foresees a second, similar campaign to commence in October 2022.

### BMCT, MUMBAI

The capital dredging works executed for the PSA terminal in Mumbai were concluded ahead of schedule and brought the available water depth down by 1 m to 15.5 MCD. Our vessels, CSD 'Al Mahaar' and a TSHD were deployed at the site.

### EAST COAST PROJECT

In a joint venture with Larsen & Toubro, the majority of the 12 m<sup>3</sup> million capital dredging works for a new harbour have been finished. Upon completion of jetty and shore protection works by our partner, a final maintenance and clean-up campaign will conclude the works.

## PAPUA NEW GUINEA

### LOWER OK TEDI RIVER

In an extraordinary feat, highlighting the resilience and dedication of our team, we achieved 10 years LTI-free at Lower Ok Tedi in Papua New Guinea – the most remote project in our portfolio and also the most longstanding project, as we mark our 25<sup>th</sup> year there in 2022.

Our team's accomplishment is all the more remarkable given that the last two years have taken place during the coronavirus pandemic. In recognition of this exceptional milestone, Ok Tedi Mining Limited (OTML) presented a Certificate of Achievement to DEME. This award recognised that our rigorous QHSES standards have allowed our local employees and fly-in fly-out personnel to return home safely at the end of each shift. This is possible due to the dedicated support and perseverance from our QHSES department and onsite medical team.

Over this decade, DEME's vessel 'Cap Martin' has dredged some 100 million m<sup>3</sup> of sedimentation, which reduces seasonal flooding of the lands on which the river communities live.

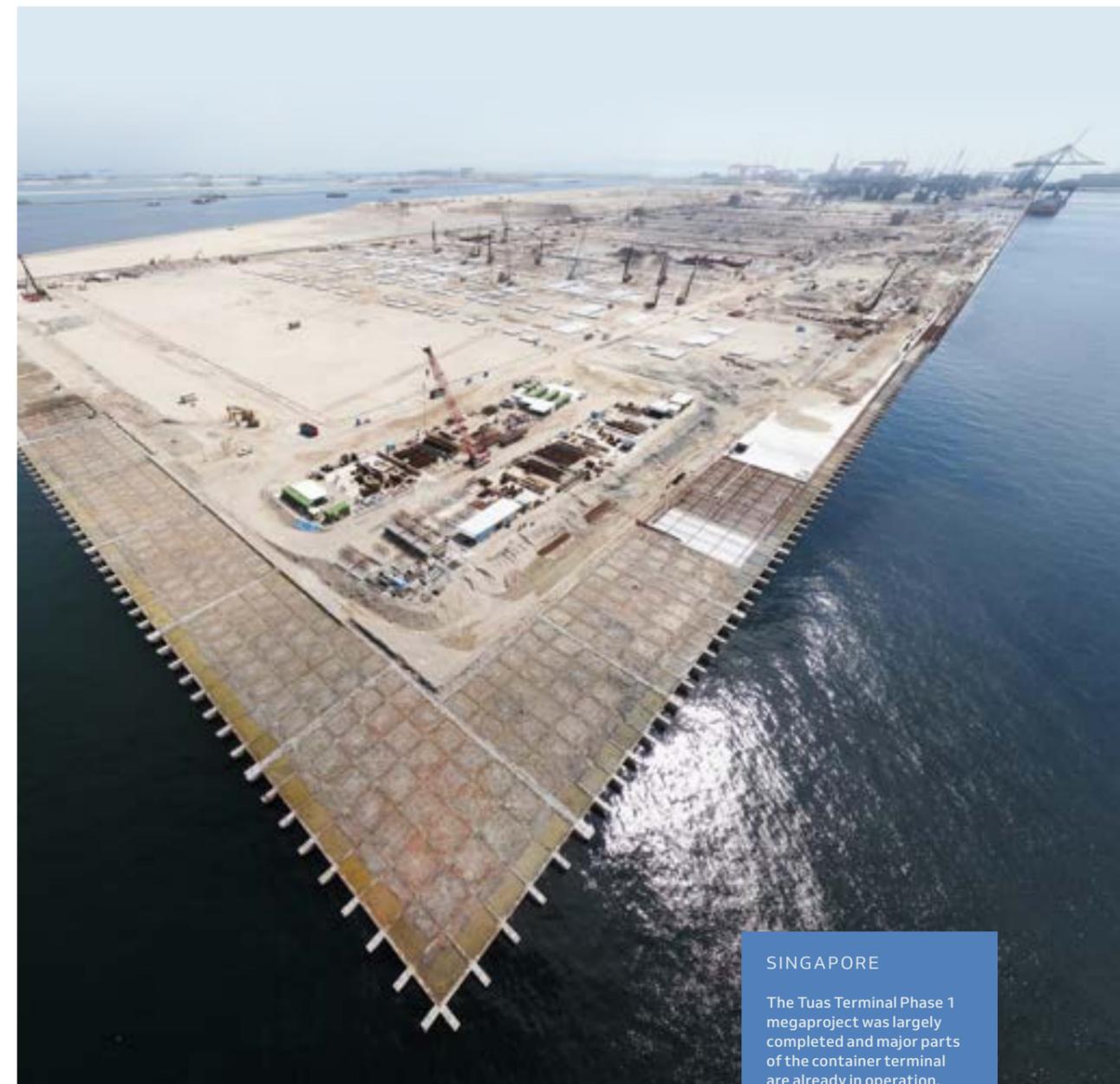
In 2021, the Ok Tedi's team spirit was certainly evident. Even though the Bige camp was hit by an outbreak of COVID, DEME still managed to achieve its annual target thanks to their hard work. A major factor in keeping operations on track was an initiative to encourage the onsite team and crew to get double vaccinated against COVID-19 to protect themselves, their colleagues and families. Showing their dedication, everyone got on board and this has enabled DEME to maintain its production levels and even exceed them.

The Ok Tedi project is also a great example of our vision to achieve a sustainable world. A vast area of what was once a rainforest dieback area is being rehabilitated for local communities. Through the efforts of our survey team, reclamation crews and the earthmoving department, both the East and West Bank are newly established. We are honoured to play a role in improving the health of a river system so vital to the community, and to see a beautiful rainforest being restored.



PAPUA  
NEW GUINEA

The Lower Ok Tedi in Papua New Guinea is the most remote project in our portfolio.



SINGAPORE

The Tuas Terminal Phase 1 megaproject was largely completed and major parts of the container terminal are already in operation.

## SINGAPORE

### TUAS TERMINAL PHASE 1 (TTP1)

The huge Tuas Terminal Phase 1 megaproject was largely completed in November 2021, and major parts of the container terminal are already in operation. Performed together with our South Korean joint venture partner Daelim Industrial, TTP1 included the construction of an 8.8 km of a quay wall, and the reclamation of a staggering 88 million m<sup>3</sup> of land from the sea. At its peak around 3,000 people and numerous vessels were working on site.

### JURONG ISLAND WESTWARD EXTENSION (JIWE)

Following on from the completion of the infrastructure works in 2020 at the Jurong Island Westward Extension (JIWE) project, additional soil improvement and earthmoving works were performed by our DIAP-SHAP joint venture. These were wrapped up in July.

### AYER MERBAU RECLAMATION PHASE 2

In another important project on Jurong Island for the government agency JTC, the same team working on the JIWE project concluded a second major design and build contract at Ayer Merbau in July. This project included 35 ha of land reclamation. We were delighted to win the JTC Construction Safety Award in the Infrastructure and Land Reclamation category on both projects and the Safety and Health Award Recognition for both Jurong Island projects (SHARP) for the third time. The jury praised our transparent and bottom-up safety culture at the awards ceremony held on October 11.

## AN EXEMPLARY SAFETY RECORD IN SINGAPORE

The Ayer Merbau Phase 2 project and the Jurong Island Westward Extension project both won the SHARP Award in 2021. This is the outcome of a dedicated effort from each member of the DIAP-SHAP joint venture team.

The SHARP Award recognises large-scale projects or worksites that have an impressive safety and health performance, as well as good workplace safety and health management systems. The award is an initiative of the Ministry of Manpower of Singapore.

Both projects were also recognised with the JTC Construction Safety Award 2021. JTC Corporation (JTC) is the lead agency in Singapore spearheading the planning, promotion and development of a dynamic industrial landscape and is one of the key clients in the dredging and reclamation sector in Singapore.



#### SINGAPORE

Both the JIWE and Ayer Merbau project have won important awards for their outstanding and exemplary safety standards.



#### SOUTH KOREA

We kicked off the works on the Incheon Fairway project on schedule.

## SOUTH KOREA

### INCHEON FAIRWAY

We were awarded a new contract in South Korea to perform maintenance dredging works in the fairway of the port of Incheon. This again sees us team up with our TTP1 joint venture partner Daelim Industrial, which is the main contractor for the project.

We kicked off the works on schedule with our TSVD 'Congo River' in August. The dredged material is being pumped ashore using a 7 km long sinker and land line. The project will continue into 2022.

The Incheon project also highlights DEME's drive for operational excellence. This was the first project where our new, online site reporting tool was deployed. It boosted productivity considerably with the online dashboards making it much easier to get an overview of all the production data and progress made. The tool is now being subsequently being rolled out throughout our other regions.

## TAIWAN

### KUANTANG – THIRD LNG RECEIVING TERMINAL

By the end of 2021, 22 caissons for the new greenfield Kuantang harbour development were installed by our joint venture partners Pan Asia Engineers and Constructors, and Hwang Chang General Contractor. Awarded by CPC Corporation, Taiwan's state-owned oil company, this project is undergoing major changes as the LNG terminal is being relocated 455 m further offshore in deeper water. 🌱

## MIDDLE EAST



## EGYPT

### ABU QIR 1 - CONTAINER TERMINAL

Impressive progress has been made at the Abu Qir 1 project in Egypt throughout the year, with the first phase completed in January 2022 by DEME's cutter suction dredgers 'D'Artagnan' and 'Amazone'. The works are related to the construction of Hutchison Ports Abu Qir Container Terminal, which will have a capacity of 2 million TEU, and be located within a new greenfield port (see Abu Qir 2 project).

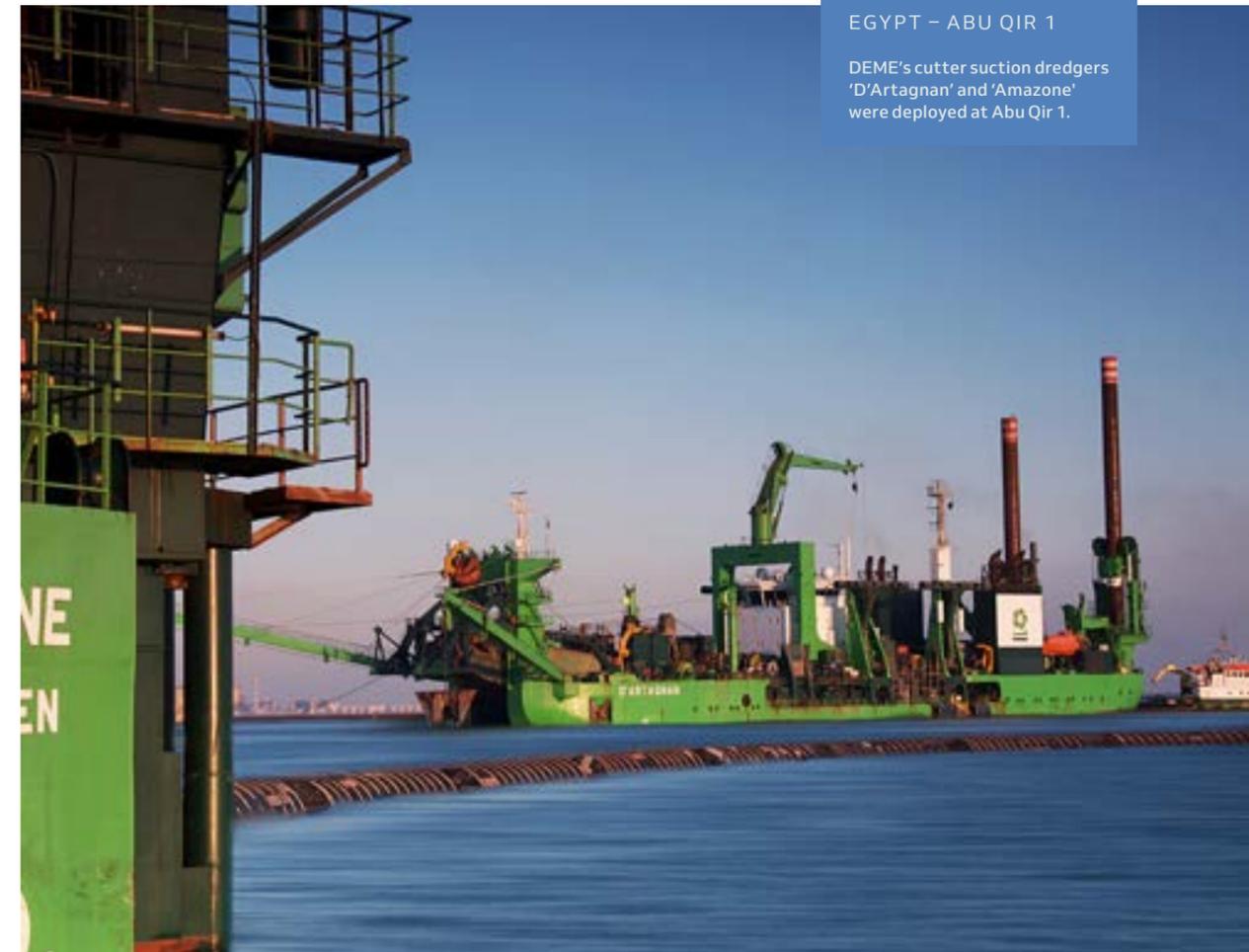
DEME has been engaged as a subcontractor by China Harbour Engineering Company (CHEC) and is responsible for dredging the access channel, turning basin and berth pocket for the 1,200 m quay, which will eventually have three berths, as well as for the reclamation of the container terminal. Dredging to depths of -17 m, the cutter suction dredgers had already dredged 12 million m<sup>3</sup> of the expected 14 million m<sup>3</sup> of material by the end of January.

One of the reasons the team has made such good progress was the introduction of an innovative spreader pontoon ('Al Dana') which was able to build the containment bunds with clay from the reclamation material. Being able to reclaim unsuitable material onshore was much cheaper and more sustainable than dumping it offshore. By using 'Al Dana' as a spreader pontoon with a new installation to segregate clay balls from slurry, DEME was able to construct the reclamation in a very controlled way.

With phase 1 finished in January 2022, DEME has handed over the works to CHEC, who will start works on the quay wall and the terminal.

#### EGYPT – ABU QIR 1

DEME's cutter suction dredgers 'D'Artagnan' and 'Amazone' were deployed at Abu Qir 1.



## EGYPT – ABU QIR 2

This is Spartacus' first project and the new flagship is certainly proving itself, with very impressive production rates and high levels of workability.



### ABU QIR 2 – A NEW CITY AND A NEW PORT

In a staggering accomplishment, DEME's fleet of cutters and hopper dredgers have reclaimed well over 130 million m<sup>3</sup> of material at the huge Abu Qir 2 project. Representing the largest dredging and land reclamation contract in DEME's history, the Abu Qir 2 project will see a new city and greenfield port constructed in Abu Qir, near Alexandria. It will be one of the deepest and biggest ports in the Mediterranean Sea.

Within a month of being awarded this prestigious contract by the Egyptian Navy in late 2020, DEME's TSHD 'Nile River' arrived on site and was swiftly followed by 'Reynaert', 'Artevelde', 'Brabo', 'Breughel', 'Breydel', 'Congo River', 'Bonny River', 'Uilenspiegel', 'D'Artagnan' and 'Ambiorix'. DEME's giant new cutter 'Spartacus' arrived in August, immediately after its commissioning.

Abu Qir 2 is Spartacus' first project and the new flagship is certainly proving itself, with very impressive production rates and high levels of workability. 'Spartacus' is the last vessel to return to port when weather conditions are challenging. The strength of DEME's fleet is really put in the spotlight in Egypt – the team managed to achieve volumes of 800,000 m<sup>3</sup> in a single day.

Overall, Abu Qir 2 represents volumes of 167.5 million m<sup>3</sup>, where DEME will dredge to depths of -22 m to accommodate the next generation of vessels. 🌱

## EGYPT – ABU QIR 2

The team managed to achieve volumes of 800,000 m<sup>3</sup> in a single day.



## EGYPT – ABU QIR 2

Abu Qir 2 will be one of the deepest and biggest ports in the Mediterranean Sea.

## AFRICA

### CONGO- BRAZZAVILLE

#### POINTE-NOIRE PORT

In a new country for DEME we are performing a maintenance and capital dredging project to extend Pointe-Noire port on behalf of the Port Autonome de Pointe-Noire (PAPN). Over two months TSHD 'Marieke' dredged approximately 600,000 m<sup>3</sup> of material.



### ANGOLA

#### PORT OF SOYO

We conducted an annual maintenance campaign in the navigation channel to the Port of Soyo, as part of a five-year contract awarded by Angola LNG. Performed in a joint venture, the dredging work enables LNG carriers to safely access the port. It is crucial that the work is carried out before the start of the sea turtle breeding season and the campaign was even completed ahead of schedule in 2021. Approximately 4 million m<sup>3</sup> of material was dredged.

#### NEW NAVAL BASE, SOYO

In a contract for the Ministry of Defence, we are constructing a new port for the Angolan Navy in Soyo, together with a leading local civil contractor. Our new 2,500 m<sup>3</sup> TSHD 'River Thames', which is stationed in Africa, kicked off the dredging works and then she was joined by our TSHD 'Marieke'. Overall, we will dredge 4 million m<sup>3</sup> and reclaim 700,000 m<sup>3</sup>.

#### CONGO-BRAZZAVILLE

TSHD 'Marieke' is performing a maintenance and capital dredging project to extend Pointe-Noire port.

## GABON

### OWENDO PORT

We carried out five interventions for several clients in Owendo Port. Performed on behalf of the French group Bolloré Transport & Logistics, the Gabon Special Economic Zone (GSEZ) and Gabon Port Management (GPM), our TSHDs 'Marieke' and 'River Thames' dredged to depths of -12 m to enable vessels to access their terminals easily.

## GHANA

### ELMINA PORT

A major project to develop Elmina fishing port, enabling it to accommodate much larger vessels, is in full swing. Awarded from the Government of Ghana, the contract includes the construction and rehabilitation of the port, including the extension of the breakwaters and deepening the port to -6 m. In Q4 2021, we were busy stockpiling rocks for the new breakwater and carrying out dry excavation works.

## GUINEA

### KAMSAR

We again performed the annual maintenance campaign 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. Approximately 350,000 m<sup>3</sup> was dredged this year.

—  
**DEME is very proud to win its first tender in Senegal.**  
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## NIGERIA

### BONNY AND ONNE

Our yearly maintenance dredging works continued in the access channel to the LNG terminal in Bonny, which ensures that the ports of Onne and Harcourt remain accessible. This is part of a long-term PPP with the Bonny Channel Company, a joint venture with the Nigerian Ports Authority.

### BONNY AND BODO

In 2020, our close-knit team managed to complete the first 6 km phase, despite the many challenges. Under the new contract out TSHD 'Reynaert' will be deployed to reclaim 1,7 million m<sup>3</sup> of sand for the Southern part of the road towards Bonny.

## SENEGAL

### SAINT LOUIS

In another new country for DEME, we are very proud to win our first tender in Senegal, and especially considering the project is so important to the socioeconomic development of Senegal. One of its major fishing ports, Saint Louis, has extremely shallow waters in its access channel, which is also very narrow and around 5km from the sea. The channel is continually subject to siltation, making it impossible for the fishermen to operate and get their boats around the sandbars that build up. The project started in September.



### GABON

We carried out five interventions for several clients in Owendo Port.

# CTOW

Specialist maritime services company Combined Marine Terminal Operations Worldwide (CTOW) has expanded its operations to the Port of Duqm in Oman, adding to its existing activities in Nigeria.

Four vessels from CTOW's fleet are based in Nigeria: two 85-tonne bollard pull ASD tugs, 'CTOW Kathy' and 'CTOW An Sofie', a 60-tonne bollard pull ASD tug 'CTOW Lala' and a Stan Tender 1905 pilot launch 'CTOW Eli'. During the year, our Nigerian colleagues were very vigilant about implementing strict health and safety measures in order to keep COVID at bay, which meant that operations there were largely unaffected by the pandemic.

At the end of 2020, Combined Marine Terminal Operations Marafi LLC (CTOM LLC) was established, which is a joint venture between CTOW NV and Oman's MARAFI LLC and PODC SAOC. The new company was able to secure a long-term Exclusive Marine Services Licence for all traffic calling at the Port of Duqm in the Sultanate of Oman.

In early January, CTOM began to operate with the ASD tug 'CTOW Bieke', and then a month later, 'CTOW Bieke' was joined by two pilot launches owned by the port authority.

CTOM is performing towage, pilotage and other marine services for breakbulk vessels, containerships, fishing trawlers and naval vessels in the greenfield port. As well as this, the fleet provides assistance to the vessels calling at the Oman Drydock Company (ODC), working together with the three tugs operated by ODC.

The new colleagues in Oman have been able to benefit from the transfer of expert knowledge from their Nigerian colleagues remotely via MS Teams, including support with advice about preventive maintenance procedures and standard operating procedures. 🌱



# DEME BUILDING MATERIALS

DEME Building Materials (DBM) saw a significant recovery in the marine aggregates business, with high levels of activity, compared to 2020, which was initially impacted by the pandemic. Demand is buoyant across the board in its major markets such as France, the UK, Belgium and the Netherlands. This has led to very high levels of fleet occupancy.

Supplies to both regular clients and the major infrastructure projects taking place in the Benelux resulted in a very busy year at its four production locations in Amsterdam, Vlissingen, Ostend and Boulogne-sur-Mer.

## THE NETHERLANDS

### New Lock Terneuzen

In the Netherlands, the New Lock Terneuzen project continued apace with almost continuous concrete pouring underway. For DBM, this often represented volumes of 20,000 tonnes of marine aggregates per week. In December, the supply peaked when eight ships in a row transported aggregates to the project, representing 24,000 tonnes in just four days. (also see page 131 in the Infra section). Overall, the DBM team has to deliver around 630,000 tonnes of concrete aggregates for the construction of the New Lock.

### Blankenburg Connection

After some trial runs in mid-2020, the concrete production at the Blankenburg Connection project really started up in 2021, again with large volumes. The Blankenburg Connection represents volumes of approximately 600,000 tonnes of sand and gravel. These megaprojects, on top of serving DBM's regular clients, show that the team is focused on getting the aggregates processed and delivered on time. DBM's main hub in Vlissingen is handling the dredged aggregates, which are screened, crushed and washed.

### Ijmuiden Lock

The Ijmuiden Lock in Amsterdam also marked a very important occasion, when it officially opened at the end of January 2022. DBM supplied almost 1 million tonnes of aggregates for the construction of this huge lock, and both the company and crew are looking forward to sailing the aggregates' dredgers through the lock they helped to build. With the official opening of the Ijmuiden Lock in the Port of Amsterdam five years after the successful delivery of the Kieldrecht Lock in the Port of Antwerp, DBM can look back with immense pride on its contribution to these two projects. Indeed, these are the two largest sea locks in the world, and they are excellent showcase projects, spotlighting the use of marine aggregates.



The main hub in Vlissingen is handling the dredged aggregates, which are screened, crushed and washed.



The team can look back with pride on its contribution to the Ijmuiden Lock.

## FRANCE

DBM has also seen healthy levels of activity in France through its longstanding clients. Besides the regular supplies of aggregates for the production of concrete, there were also a number of other interesting, representing volumes in the range of 100,000 tonnes per project. Such volumes are relatively small when compared to dredging works, nevertheless they could be executed efficiently thanks to the versatility and the flexibility of the DBM fleet.

In Le Havre, the company supplied aggregates for filling caissons and cofferdams, as well as aggregates for foundation works in the port, including a cofferdam for a new ro-ro quay.

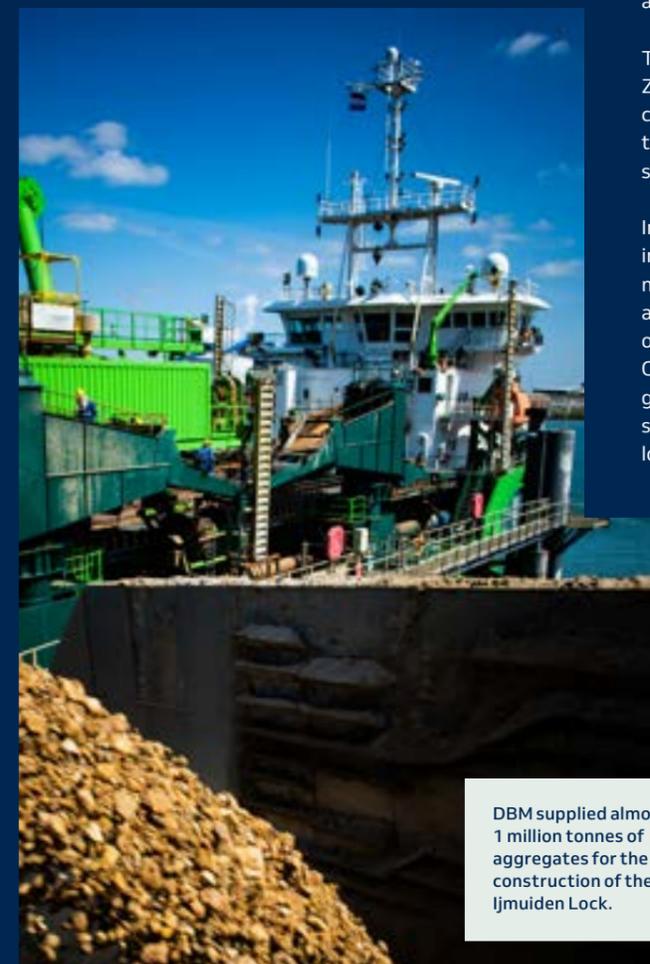
## BELGIUM

### Oosterweel link

DBM was delighted to win a contract for the exclusive supply of marine aggregates for the tunnel elements for the Oosterweel link project (see page 133 in the Infra section). After the Blankenburg tunnel, this will be the second submerged tunnel that will be constructed using marine aggregates produced by DBM. DEME Group is part of the THV COTU consortium which will construct the Scheldt tunnel. This is a key element of the project and will complete the Antwerp Ring Road.

The tunnel elements are being built in Zeebrugge in a special construction dock. The concrete for the elements will be produced in two concrete batching plants at the project site and these will be supplied by DBM.

In fact, this is not the first time DBM has been involved with the Oosterweel link project. The many flyovers and other concrete structures that are appearing around Antwerp on the Left Bank of the Scheldt, as part of the first phase of the Oosterweel link, also contain marine sand and gravel that was dredged, transported, processed, screened, crushed, washed, quality checked, loaded and shipped to Antwerp by DBM. 🌱



DBM supplied almost 1 million tonnes of aggregates for the construction of the Ijmuiden Lock.

# 95

## OFFSHORE



DEME Offshore is the leading provider of solutions for the offshore 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 have an unrivalled expertise 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.

## FRANCE – SAINT-NAZAIRE

The innovative MODIGA encapsulates the drilling and installation operations, and protects them from the adverse Atlantic marine conditions.



## DENMARK

### VESTERHAV SYD AND VESTERHAV NORD OFFSHORE WIND FARMS

In November, we were awarded a contract from Vattenfall for the monopile and transition piece transport and installation for the nearshore Vesterhav Syd and Vesterhav Nord offshore wind farms. The two wind farms represent a capacity of 344.4 MW and will comprise 41 Siemens Gamesa 8.4 MW turbines.

## FRANCE

### SAINT-NAZAIRE OFFSHORE WIND FARM

In an extraordinary example of DEME teamwork the installation of the foundations at the Saint-Nazaire offshore wind farm is firmly on track, despite the fact that most of them are being drilled directly into rock using innovative new equipment. This project solidifies our reputation as the number one wind farm contractor. Not only are we the first to install an entire wind farm in rock, this project is being carried out in the harsh Atlantic conditions.

Saint-Nazaire is the first commercial offshore wind farm ever built in France and also the first to use drilled, XL monopile foundations.

#### Unique DEME equipment

46 of the 80 foundations had been installed by the end of the year. For this special project DEME and its partner Herrenknecht, the global leader in tunnel boring machines, jointly designed a giant, 350-tonne Offshore Foundation Drill (OFD) to perform the drilling work for the XL monopiles. Other unique equipment developed for Saint-Nazaire is the so-called MODIGA. At nearly 60 m high, the MODIGA encapsulates the drilling and installation operations, protecting them from the adverse Atlantic marine conditions, which in turn enhances operational working time.

These innovative pieces of equipment have never been seen before in the industry. DEME's willingness to invest in this pioneering equipment and the efforts of the project team and crew of our jack-up vessel 'Innovation' are reflected in the progress being made at Saint-Nazaire.

Additionally, our dredging colleagues carried out the seabed preparations, and this, coupled with the Innovation's rock tips/dampers, enabled the team to install the foundations so successfully, indeed a true 'One DEME, One Team' effort.

# RENEWABLES

### Successful installation of the offshore substation

Meanwhile, on 15 August another DEME team has installed the Saint-Nazaire offshore substation, and this was also a great success. When working with such innovative equipment and new installation methods, of course it took a while to get up to speed. But the team has persevered, showing a tremendous work ethic to make sure production is maximised to its full potential and that the groundbreaking equipment is working entirely, and even better than our expectations. We are proud to be showing how we can perform, even when faced with such a challenging project.

### FÉCAMP AND COURSEULLES OFFSHORE SUBSTATIONS

Preparations are underway for the transport and installation of the offshore substation (jacket and topside) for the Fécamp and Courseulles offshore wind farms. The Fécamp and Courseulles substations are being designed and manufactured by Atlantic Offshore Energy with its partners SDI (part of the DEME Group)/DEME Offshore and GE Grid Solutions. As well as the transport and installation, DEME will carry out the pre-piling for both substations. To ensure a smooth operation we will use the same seabed template designed for Saint-Nazaire.



FRANCE – SAINT-NAZAIRE

The offshore substation was successfully installed in August.

## FIRST FLOATING OFFSHORE WIND CONTRACT IN THE MEDITERRANEAN AND FOR DEME OFFSHORE

In April, we were extremely proud to be awarded a cable contract for our first floating offshore wind project and indeed, for one of the first floating wind farms in the world.

Transmission system operator Réseau de Transport d'Électricité (RTE) awarded an EPCI contract for the export cable that will connect the Leucate Floating offshore wind farm to the power grid, in a consortium with JDR Cables. The 30 MW wind farm is being developed by Les Eoliennes Flottantes du

Golfe du Lion (EFGL), and is located 16 km off the South East coast of France.

The export cable will include a submarine cable and an onshore cable section, connecting into the onshore substation near Le Barcarès.

## GERMANY

### ARCADIS OST 1 OFFSHORE WIND FARM

The fabrication of the 28 giant, XXL monopiles for Parkwind's Arcadis Ost 1 offshore wind farm got underway in 2021. At 2,000 tonnes each and 110 m long, these huge structures are the biggest ever seen in the industry. DEME Offshore was awarded the EPCI contract for the foundations in 2020.

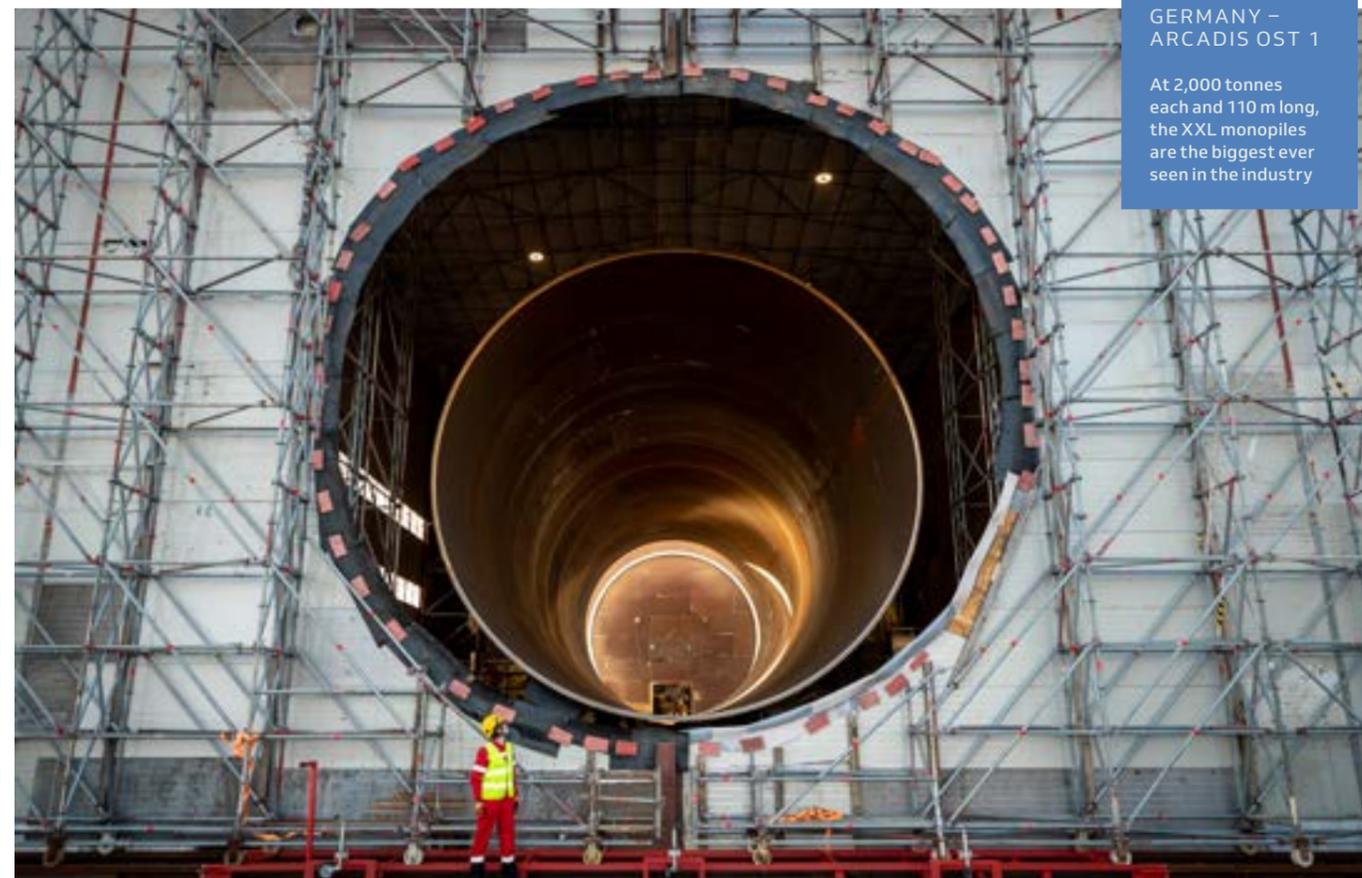
Located in the German Baltic Sea to the northeast of Rügen island, Arcadis Ost 1 is a very special project in DEME Offshore's history. It will be the first time the revolutionary DP3 offshore installation vessel 'Orion' will be deployed and in another first, the vessel will be equipped with our innovative motion compensated pile gripper. Able to handle monopiles of more than 2,000 tonnes, the integrated pile gripper enables the crew to upend the monopiles and they then remain vertical and stable, despite any motions and waves.

The 257 MW wind farm is situated in very deep water (for offshore wind farms) of -45 m and the first part of the seabed largely consists of metres of mud, therefore the 'Orion' and gripper combination is perfectly suited for this project.

Yet again, DEME Offshore is pushing the industry's boundaries. An innovative solution like this, combining a pioneering vessel with a tailor-made pile gripper, has never been done before. We firmly believe that we understand the future requirements of the offshore wind industry and that smart solutions like these are what our customers expect from us.

This EPCI award also highlights how leading companies like Parkwind have the confidence in our groundbreaking solutions and that is why it has chosen us to install these XXL monopiles for the first time in the industry's history.

Fabrication of the monopiles, internal platforms and boat landings, taking place at Steelwind in Germany, were all on track as the end of the year approached.



GERMANY – ARCADIS OST 1

At 2,000 tonnes each and 110 m long, the XXL monopiles are the biggest ever seen in the industry

## THE NETHERLANDS

### HOLLANDSE KUST (NOORD) AND (WEST ALPHA) OFFSHORE WIND FARMS

In addition to the contract for both the Hollandse Kust (noord) and Hollandse Kust (west alpha) offshore substations, DEME Offshore was also awarded the contract for the Hollandse Kust (noord) monopile installation. Deploying our jack-up 'Innovation', we will transport the 70 monopiles from the manufacturing facility in Rotterdam to the Hollandse Kust (noord) site.

In November, we successfully performed the transport and installation of the jacket for the Hollandse Kust (noord) substation on behalf of ENGIE Solutions-Iemants, which is responsible for the engineering, procurement, construction and offshore installation of the two substations. The installation of the 2,100 tonne jacket was executed with Heavy Lift Vessel 'Gulliver', which is operated by our joint subsidiary Scaldis. Despite challenging weather conditions, the installation was performed on schedule thanks to the close cooperation between our engineering teams and our client.



THE NETHERLANDS – HOLLANDSE KUST

DEME Offshore will transport and install 70 monopiles at the Hollandse Kust (noord) offshore wind farm.

### HOLLANDSE KUST (ZUID) OFFSHORE WIND FARM

DEME Offshore's cable installation vessel 'Living Stone' carried out the transportation and installation of three cables for TenneT's Hollandse Kust (zuid) offshore wind farm in the Netherlands. We transported and installed two 35 km export cables and one 8 km interconnecting cable from Hellenic Cables in Greece to the wind farm. This entailed the installation of one of the biggest (and stiffest) cables ever transported. In order to achieve this our engineering team carried out some special modifications to the vessel to facilitate the cable loading process.

## UK

### HORNSEA TWO

DEME Offshore successfully completed the installation of the final and 165<sup>th</sup> wind turbine at Hornsea Two, the world's largest offshore wind farm. Both the WTG and monopile foundation installation scopes were performed in record time.

The first 8 MW, Siemens Gamesa turbine was installed end-May 2021, and just over seven months later, the turbine installation phase was concluded, enabling Hornsea Two to generate its first renewable power just before Christmas in 2021. DEME's sister vessels 'Sea Installer' and 'Sea Challenger' worked at quite a pace, picking up four turbine sets every one to two weeks from the Siemens manufacturing facility in Hull.

Meanwhile, the foundation phase was finished off in October, taking just 12 months, and it was even completed two months ahead of schedule.

As well as the transport and installation scope for the turbines and foundations, two of DEME's fallpipe vessels carried out the scour protection at 89 locations. In 2021, 'Flintstone' and 'Rollingstone' placed approximately 150,000 tonnes of rock.

Hornsea Two is the third, large-scale offshore wind farm where DEME Offshore has been responsible for the installation of more than 100 wind turbines. Located 89 km off the UK's east coast, Hornsea Two will soon be generating up to 1.4 GW of clean energy for British households.

### HORNSEA ONE

With the unrivalled capability to work directly through the harsh winter months, DEME's DP3 cable installation vessel 'Living Stone' seamlessly completed a third cable campaign at Hornsea One offshore wind farm in January. This followed an earlier repair campaign successfully performed in 2020. In total, 'Living Stone' repaired 19 cables during the campaigns. As well as being conducted in extremely challenging winter weather conditions, this was also a complex project because DEME Offshore had to uninstall and recover the existing cables, before installing and burying the new replacements.



## DEME OFFSHORE INSTALLS 2,500 TURBINES IN HISTORIC INDUSTRY MILESTONE

DEME Offshore announced that a remarkable milestone was achieved during the Hornsea Two project. The company has now installed more than 2,500 turbines worldwide, underlining its position as the number one offshore wind farm contractor, and of these, the majority have been installed

by DEME's sister vessels 'Sea Installer' and 'Sea Challenger'. In order to remain the market leader, both vessels will get a major crane upgrade to handle the next generation turbines. In 2021 DEME installed more than 270 WTGs.

### TRITON KNOLL

DEME Offshore successfully transported and installed all 90 of the MHI Vestas V164-9.5 MW turbines for the Triton Knoll offshore wind farm. These giant turbines are the largest we have installed to date. Located approximately 32 km off the Lincolnshire coast in the UK, Triton Knoll is owned by RWE and partners J-Power and Kansai Electric Power, and it will be one of the first wind farms in the world to operate MHI Vestas' V164-9.5 MW turbines.

DEME Offshore was responsible for the design and manufacturing of the sea-fastening and tagline systems, as well as the transportation and installation of the turbines. Despite the challenges brought about by their size, the turbines were installed on schedule. In an additional challenge, the turbine installation scope also took place during the pandemic, but thanks to our very strict mitigation measures, which even exceeded government regulations, COVID did not impact the project. In 2020, our DP2 offshore installation vessel 'Innovation' had already installed 28 foundations at Triton Knoll.

### NEART NA GAOITHE OFFSHORE WIND FARM

DEME Offshore was awarded an EPCI contract for the 56 inter-array cables for the 450 MW Neart na Gaoithe offshore wind farm in 2019 and work had been due to begin in 2021.

Our own hybrid trencher, the CBT1100 - which was also significantly upgraded and modified to optimise the cutting process for the seabed conditions seen at the NNG project - was deployed for the pre-trenching works.

Under the EPCI contract DEME is 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.

### DOGGER BANK WIND FARM

We were very proud to be awarded a third major contract for the large-scale Dogger Bank wind farms in the UK – this time for Dogger Bank C.

In 2020, DEME Offshore was already awarded EPCI contracts for the inter-array cables for the Dogger Bank A and B wind farms. Together, these three contracts represent an impressive 900 km of inter-array cables and the largest inter-array award in the industry to date. Our scope includes the engineering, procurement, construction and installation of the 66 kV subsea cables for the combined 3.6 GW wind farm. Cable production was in full swing in 2021.

Dogger Bank Wind Farm is located more than 130 km off the North East coast of England and is currently being developed in three, 1.2 GW phases.

### DOLWIN6

In a groundbreaking project DEME Offshore has successfully installed the DolWin6 High Voltage DC (HVDC) cable in the North Sea deploying DP3 vessel 'Living Stone'. This is the first time a cable laying vessel has installed cables while powered on LNG, dramatically reducing emissions.

DolWin6 has a transmission capacity of 900 MW and runs from German offshore wind farms through the Wadden Sea. This was an extremely complex operation and highlights Living Stone's cable laying prowess. The vessel is equipped with two giant turntables which were perfect for the 2 x 40 km sections. But the HVDC also has a 'third' fibre optic cable, therefore we had to bundle the two core cables together with the fibre optic one using our onboard bundling machine, to allow them to be installed on the seabed as a single cable.

Specific modifications were made to the deck layout to facilitate these installation works. Despite this complexity, 'Living Stone' was able to perform the installation of the bundle in less than a week – showing how the vessel is ideal for these highly complicated operations.



UK – ZEUS SUBSEA CABLE ROUTE

DEME Offshore has been awarded the new subsea data cable named 'Zeus', which connects the UK to mainland Europe.

### PROTECTION FOR INTER-ARRAY CABLE AT EXISTING WIND FARMS

We have started carrying out repair protection works on the cable end sections of cables for offshore wind farms in the North Sea and Irish Sea. Typically, the last 15 - 20 m have to be protected by means of rock materials to prevent further damage inflicted on the cable protection systems due to currents. At the end of the year, DEME's fallpipe vessel 'Rollingstone' was busy in the Irish Sea helping to stabilise and protect the ends of inter-array cables. We performed this work on around 250 cable ends throughout the year, in UK and German waters.

## TAIWAN

### HAI LONG OFFSHORE WIND FARM

In one of the largest offshore wind farm projects in our history, CDWE - a joint venture with our Taiwanese partner - has been awarded a Preferred Supplier Agreement for the Balance of Plant contract for the mammoth Hai Long offshore wind farm. The wind farm cluster is set to generate more than 1 GW upon completion.

Under this Preferred Supplier Agreement, we have been making preparations for the Engineering, Procurement, Construction and Installation (EPCI) for the foundations, inter-array cables, export cables, and transport and installation of the offshore substations and turbines.

Our team has already selected the manufacturers for the jackets and the 219 pin piles for the 73 locations, which will be fabricated locally in Taiwan and abroad. Additionally, the export cables (representing 264 km) have also been ordered at South Korea's LS Cable & System under an Exclusivity and Capacity booking agreement. By placing these orders in good time, we are optimising the planning and scheduling for the project, which is set to be executed in 2024, subject to financial close.

To maximise local content requirements, our project team is working closely with Taiwanese suppliers to ensure that the components with long lead items are ready in time. In a demonstration of our commitment to the market, our team members have often had to spend several weeks in strict quarantine before they can work in Taiwan.

Hai Long was Taiwan's first, large-scale Balance of Plant Preferred Supplier Agreement ever awarded. The 14 MW Siemens Gamesa turbines have been selected for the wind farm, which require massive foundations of more than 2,000 tonnes and that are almost 100 m high. These huge structures can still be comfortably accommodated by the new offshore installation vessel 'Green Jade'.

### ZHONG NENG OFFSHORE WIND FARM

We were delighted that Zhong Neng Offshore Wind Farm achieved financial close in December. CDWE and the Zhong Neng Wind Power Corporation Preparatory Office have signed two contracts for this project: one for the transportation and installation of 31 jacket foundations and another for the transportation and installation of the wind turbines. Deploying the new vessel 'Green Jade', CDWE will install 93 pin piles and then the 31 jackets.

### CHANGFANG-XIDAO OFFSHORE WIND FARM

CDWE is performing the project management 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.



#### TAIWAN

CDWE, Taiwan's first offshore wind EPCI contractor, is a pioneer and driving force in the localisation of offshore wind developments.

## CHINA

### 27 TURBINES INSTALLED IN CHINA

2021 was a busy year in China as the offshore wind industry really took off. Transported via the Cape of Good Hope, our DP2 jack-up vessel 'Apollo' was chartered by the Chinese contractor China Railway Major Bridge Engineering Group Co., Ltd. (MBEC) and deployed on turbine installation projects from the north to the south. By the end of the year, 'Apollo' had installed 13 turbines at the Yudean Yangjiang project

in Guangdong province and 14 turbines at the Huaneng Dalian Zhuanghe project in Liaoning province.

DEME Offshore is the only European offshore wind contractor who has been active in China, with equipment deployed since 2017. We are pleased to have been able to continually perform the work and successfully fulfil our contractual obligations throughout the year in challenging circumstances, given the very tough coronavirus measures in place.

## SPT OFFSHORE INTRODUCES PIONEERING SUCTION PILE FOUNDED JACKETS AS WIND TURBINE FOUNDATIONS TO CHINA

SPT Offshore, acquired by DEME Offshore in November 2020, has already introduced its revolutionary suction pile jacket foundations to China's offshore wind industry.

During the year, 72 jackets were installed using SPT's pioneering, noise-free and ultra-fast technology.

Working together with China's Fujian YongFu Power Engineering, SPT Offshore's technology was deployed at the Fujian Changle Waihai Area A and C offshore wind farm. SPT carried out the detailed design of the suction pile foundation for China Three Gorges Corporation and for Fujian Energy Group Corporation. China Three Gorges selected 1 x 6.7 MW, 13 x 8 MW and 1 x 10 MW wind turbines and Fujian Energy Group, 37 x 8 MW and 20 x 10 MW turbines.

SPT Offshore installed all 72 foundations. The site is 30 nautical miles offshore and soils are relatively soft, hence the large suction pile size of 10-15 m diameter and a penetration depth varying from 17-26 m, was ideally suited for the conditions. The water depth varies from 31 to 45 m.

The heavy lift scope was performed by the Chinese companies Major Bridge, First Harbour and Third Harbour using various vessels, including a 3,600-tonne floating sheerleg and 4,600, and 12,000-tonne revolving crane barges. A major advantage of SPT Offshore's equipment is that it can easily and quickly shift between the different heavy lift vessels, sheerlegs and DP2 vessels.

### MAJOR BENEFITS

SPT's suction pile technology has several major benefits, a key one being that it is very quiet, making it more environmentally friendly and expensive noise mitigation measures such as bubble curtains are therefore unnecessary offshore. The technology also facilitates

very quick installation, in only a matter of hours, making it extremely cost-efficient. At the end of the field life, the suction pile foundations can easily be decommissioned or relocated and do not leave a trace on the seabed.

Due to the faster installation on site, vessel time is significantly reduced, in turn reducing CO<sub>2</sub> and NO<sub>x</sub> emissions and therefore, the method is less weather dependent than the traditional piling techniques. With the growing trend of increasingly stringent environmental regulations concerning drilling and driving piles offshore, suction pile technology offers a silent installation method with a proven technology.



SPT's suction pile technology has several major benefits, a key one being that it is very quiet, making it more environmentally friendly.

## JAPAN

### JAPAN OFFSHORE MARINE ESTABLISHED

DEME Offshore and Penta-Ocean Construction Co., Ltd., Japan's leading marine contractor, established a new company named Japan Offshore Marine Co., Ltd. (JOM). JOM combines DEME Offshore's marine engineering knowledge and decades of experience in the renewables sector with the highly specialised marine construction technology of Penta-Ocean. The collaboration enables DEME to play a leading role in the long-term development of Japan's offshore wind market.

Additionally, in a further commitment to the market, DEME will send 'Sea Challenger', one of its key assets, to JOM. 'Sea Challenger' will be reflagged and relocated to Japan as from 2025. Before she enters service 'Sea Challenger' will undergo an extensive upgrade, preparing her for the first round of offshore wind farm projects in Japan. A crucial step to make the vessel future-proof is the upgrade of the crane's lifting capacity from 900 tonnes to 1,600 tonnes. Additionally, 'Sea Challenger' will have a wider beam and longer legs, enabling her to handle the next generation of mega wind turbines.

'Sea Challenger' is more than ready to cope with Japan's challenging conditions such as a harsh metocean environment and complex soil. Japan has very good wind resources, generous subsidy schemes and ambitious targets. However, the soil can make conventional foundations difficult to use. DEME Offshore's drilling expertise and

suction pile technology will play a crucial role to overcome these challenges, and will enable JOM to have a unique position in the Japanese market.

So far, JOM has been supporting developers in the round 1 and round 2 offshore wind farm submissions and has already signed one Preferred Supplier Agreement for an undisclosed project.



#### JAPAN

Jack-up installation vessel 'Sea Challenger' will undergo an extensive upgrade, preparing her for the first round of offshore wind farm projects in Japan.

## VIETNAM

We have also entered into a firm commitment to develop the Vietnamese offshore wind market by starting a cooperation with the leading local Oil & Gas EPCI contractor, Vietsovetro. We will exclusively team up to develop localised solutions for the Vietnamese market, which should develop rapidly in the future, and do so leveraging Vietsovetro's EPC capabilities along with our specialist installation fleet.

The DEME Group has been active in Vietnam since 1995, has garnered a sizable track record in dredging works in the country and has a local presence through its office in Hanoi.

## US

**In a major breakthrough in the much-anticipated US offshore wind market, DEME Offshore has been awarded several new contracts.**

### COASTAL VIRGINIA OFFSHORE WIND

In an extraordinary deal concluded in 2021, DEME Offshore was awarded Dominion Energy Group's Balance of Plant (BoP) contract for the construction of the Coastal Virginia Offshore Wind (CVOW) project in a consortium with Prysmian Group. Representing a total capacity of 2.6 GW, this is not only the largest offshore wind installation contract ever awarded in US history, on completion, CVOW will be the second largest offshore wind farm in the world. This is also the biggest single cabling contract in DEME's history. CVOW is located approximately 27 miles (43 km) off the coast of Virginia Beach.

This exceptional contract reaffirms DEME's position as the leading offshore wind farm contractor in the industry, and it also highlights the company's breakthrough in the US market. CVOW followed directly on from awards for Vineyard Wind 1, the first utility-scale offshore wind project in the US, and the South Fork offshore wind farm off the coast of Long Island.

### 176 foundations

The CVOW BoP contract includes the transport and installation of 176 monopile transition piece foundations, three offshore substations, scour protection and the supply and installation of export and inter-array submarine cable systems. DEME has already joined forces with leading maritime service providers such as FOSS Maritime Company to develop smart new feeding concepts for wind farm projects. FOSS will transport the components on smart barges from the base port to DEME Offshore's installation vessels.

The CVOW project will play a crucial role in helping the State of Virginia meet its goal of becoming carbon neutral by 2045. The offshore wind farm will be capable of supplying clean power to as many as 660,000 households and reducing carbon emissions by over 2 million tonnes per year.

### VINEYARD WIND 1

After building up our presence in the US market for years, we were delighted to land our first US offshore wind contract in spring 2020, when we were announced as the preferred bidder of Vineyard Wind 1. Subsequently, DEME Offshore has been awarded several major scopes. In addition to the installation of the turbines for this project (signed end-2020), we will now also handle the transportation and installation of the monopile foundations, transition pieces, offshore substation and

scour protection for the wind turbine foundations, as well as the offshore substation foundation and platform.

We are very proud of this achievement, not only regarding the scope but also about the agreement with the unions. We always promote cooperation with local companies and local people, and believe in the success of bringing people from different backgrounds and expertise together in one team.

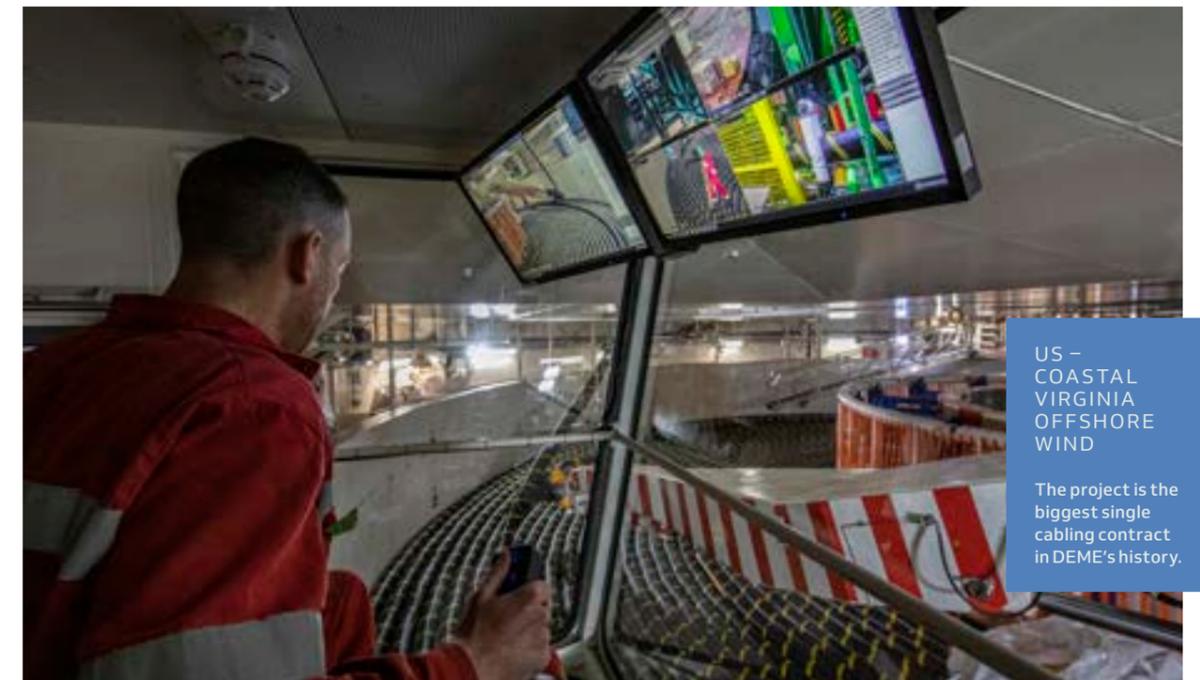
Vineyard Wind 1 is the first large-scale wind farm in the US. Located 15 miles off the coast of Martha's Vineyard, Vineyard Wind 1 will have a generating capacity of 800 MW and reached financial close in September 2021, resulting in a Full Notice To Proceed for DEME.

In 2021, engineering and preparatory work started and we selected the specialist project team, which is based at our US office in Boston. This year we will expand our footprint closer to the actual operations, which are scheduled to take place from New Bedford, Massachusetts. The team is supported by experts from our European offices.

Vineyard Wind 1 will provide clean electricity to more than 400,000 homes and will reduce carbon dioxide emissions by 1.68 million metric tonnes annually.

### SOUTH FORK OFFSHORE WIND FARM

In a third US offshore wind farm project, also awarded in 2021, DEME Offshore will transport and install the export and inter-array cables for the 132 MW South Fork offshore wind farm. The team for this project has started the preparations out of DEME's Boston, US office and our European offices, but later a part of the team will move to the state of Rhode Island. 🌱



#### US – COASTAL VIRGINIA OFFSHORE WIND

The project is the biggest single cabling contract in DEME's history.

## G-TEC

G-tec is our specialist geoscience services company, which provides a broad range of offshore site investigations, data management and geographic information system (GIS) services. The company has also developed multiple versions of the gradiometer frame the 'MagWing', which are ideal for the detection and positioning of exposed and buried magnetic objects.

### GEOPHYSICAL INVESTIGATION OF THE EXPORT CABLE CORRIDOR FOR CODLING WIND PARK

One of the major projects performed during 2021 was for the proposed Codling Wind Park, which represents one of the largest energy infrastructure investments in Ireland and is set to become one of the country's biggest offshore wind farms, with a maximum total energy output of 2.1 GW. Codling Wind Park is approximately 13-22 km off the County Wicklow coast and is on a total project area of approximately 125 km<sup>2</sup>.

Our experts performed a detailed geophysical site investigation of the route for the export cable. Despite the challenging conditions such as very strong currents and deep canyons, the team produced a substantial dataset, which is now being further processed by the client's specialists.

### DATA MANAGEMENT AND GIS SERVICES

A key focus of the company is data management and GIS services, which are integrated into our geophysical services. This enables us to extract powerful datasets, providing in-depth insight for our clients. For example, our GIS solutions help improve the efficiency and quality of operational insight for offshore wind farms, which typically generate massive (spatial) datasets. We can for example, store all the geographical data gathered from our geophysical site investigations about cables. This can then be used to identify potential problems likely to arise in the future, allowing the developer to carry out mitigation measures well ahead of any issues.



### IN-HOUSE DESIGNED MAGNETOMETRY GRADIOMETER - MAGWING

Another cutting-edge development is our magnetometry gradiometer, known as MagWing. This multiple gradiometer frame provides highly accurate positioning of the detected objects laying on and below the seabed. The latest version, the MagWing 6.8, features an impressive 6 m wide frame with up to five gradiometers, ensuring very high production rates, minimising infills and substantially reducing the number of false positives - saving time and money for our clients. The presence of objects can represent a substantial risk for any marine project, whether it is for dredging, offshore renewable energy or pipeline laying etc. Therefore, a seabed clearance campaign is indispensable for analysing and mitigating the risks and for personnel working at the future site.

### UXO MANAGEMENT

With nearly 30 years of experience in carrying out UXO detection, we have applied our knowledge and deployed this unique platform on multiple projects in Northern Europe, including a major wind farm development project in France. After the UXO survey and the associated data processing and interpretation, an ROV spread was deployed to identify the targets and confirm them as UXO or non-UXO.

### GEOPHYSICAL INVESTIGATIONS

Combining our core specialities in high-resolution, multibeam surveys with an ROV inspection and GIS, allows G-tec to extract valuable insights during below-water inspections of offshore wind assets. Our team is regularly deployed to examine foundations, scour protection and cables.

During the year, our geophysical investigations included a wide variety of surveying projects. We carried out more than 1,600 km of ultra-high resolution, multi-channel seismic surveys to assist our customers in developing and designing several offshore wind farms in various countries in Europe.

Additionally, under a framework contract for the Walloon inland waterways authority (SPW) we are contracted to regularly inspect the waterways with both multibeam and LiDAR scanners. Following severe flooding in Belgium in mid-July, we were also asked to check all the riverbanks and bridge foundations for damage, and flag up any obstacles in the water that needed to be removed. 🌿



# ROCK PLACEMENT, LANDFALL CONSTRUCTION & OFFSHORE CIVIL WORKS

## DENMARK

Landfall works  
at the Europipe II  
project.

## SHELL PULAU BUKOM REFINERY, SINGAPORE

Dredging works at the Pulau Bukom Shell refinery are expected to kick off in 2022, following a delay due to the impact of the pandemic. The facility is linked to an offshore buoy and a 2.5 km section of the subsea pipeline has to be removed and replaced. DEME has been assigned to carry out the rock removal scope, trench dredging and backfilling of the trench upon completion of the pipelay works.

## EUROPIPE II, DANISH NORTH SEA COAST

Europipe II was successfully completed on behalf of our client, Allseas. DEME prepared the shore approach and landfall at Houstrup, on the west coast of Denmark, in 2020. Then in January the team started the construction of the 202 m cofferdam. Dredging was performed by DEME's backhoe dredger 'Samson' and the TSHD 'Mellina'. And this was followed by the pipe pull and backfilling.

Europipe II is a new export pipeline for natural gas to Poland which is being linked with the existing Europipe, running between Norway and Germany.

### HINKLEY POINT - UK

Balfour Beatty appointed our UK subsidiary New Wave Solutions (NWS) as a subcontractor for Hinkley Point under an Early Contractor Involvement (ECI) agreement. Our scope includes dredging works for six pits required for the construction of the four intake and two outfall structures of the new power plant.

Work on the pits eventually got underway in August and they were fully dredged by end-October. The silt up will be removed prior to the installation of the six huge 'heads' (concrete gravity based structures). Four of these heads weigh more than 5,000 tonnes each. Two heavy lift vessels, 'Gulliver' and 'Rambiz', (from our joint subsidiary Scaldis), are due to perform this operation. Subsequently, scour protection will be installed around the structures by the multipurpose pontoon 'Naseem'. In the next phase of the Hinkley project, two jack-ups will drill through openings in the pre-cast concrete structures and shafts will be lowered and grouted inside. The shafts will then be connected to the pre-installed tunnels to the shore at a later stage. Extensive 3D-simulator training took place during 2021, followed by a full-scale trial preparing the team for the project.

### EUROPIPE II AND BALTIC PIPE

In two major projects, we performed pipeline protection works for both Europipe II and the Baltic Pipe, as part of the new, 900 km Gaz Pipe System project, connecting Norway to Danish and Polish gas infrastructure. On behalf of Allseas, we placed rock materials for pipeline crossings and protection works for Europipe II. Then for Saipem, rock dumping works for pipeline protection were completed during November 2021 for the Baltic Pipe project. The DP fallpipe vessel 'Flintstone' installed approximately 300,000 tonnes of rock protection at the Gaz Pipe System project.

### GULF OF MEXICO

Our fallpipe vessel 'Rollingstone' has been back in the Gulf of Mexico carrying out pipeline protection works for the Ichalkil and Pokoch Projects over the summer months for Fieldwood Energy.

### NORTH SEA

In and around the North Sea we have performed several smaller free span correction works and scour protection jobs for leading industry names such as Equinor, Shell, Perenco, Dana Petroleum and BBL amongst others.

### VIKING LINK

We were awarded a two-year contract to perform various rock placement campaigns for the 1,400 MW Viking Link Interconnector, which is set to become one of the world's longest electricity interconnectors. At 760 km, Viking Link runs between the UK and Denmark. Our fallpipe vessels 'Flintstone' and 'Rollingstone' performed three crossing preparation and cable protection campaigns during the year. We will carry out further campaigns in 2022. Additionally, DEME Offshore carried out cable protection and crossing protection works at the Edvard Grieg oil and gas field.



#### HINKLEY POINT - UK

Extensive simulator training took place to prepare for the installation of the concrete structures.



Our fallpipe vessels 'Flintstone' and 'Rollingstone' performed various campaigns for the Viking Link interconnector.



# PLATFORM INSTALLATION & DECOMMISSIONING

## DECOMMISSIONING OF 11 PLATFORMS IN THE SOUTHERN NORTH SEA

We are in the final phases of the detailed engineering to perform the decommissioning of the first four platforms (Vanguard QD, North Valiant, South Valiant, Vulcan). These four have jackets of approximately 1,500 tonnes and topsides of 1,000 tonnes.

Awarded by Harbour Energy, this decommissioning work is part of a major contract for 11 platforms in the UK sector of the Southern North Sea, which is being carried out in partnership with AF Offshore Decom AS. AFOD prepares the platforms for removal, while DEME is responsible for the marine engineering, removal and transportation. 🌱



**116**

**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 and sediment treatment, water treatment and high water protection infrastructure.

# SOIL REMEDIATION & BROWNFIELD DEVELOPMENT

## BELGIUM

### FORMER FORD SITE - GENK

In a new project for the Flemish inland waterway authority (De Vlaamse Waterweg), we started to perform rehabilitation works at an old Ford site in Genk. Our scope includes earthmoving, groundwater remediation, infrastructure works and landscaping and ultimately, the site will be turned into a new logistics hub. We expect to handle volumes of 400,000 m<sup>3</sup> and the project will take two years to complete. As a member of the consortium Genk Green Logistics, we won a public tender in 2017 to remediate 40 ha of the site and a year later on, to perform demolition and soil remediation works on a further 70 ha. During this phase some 120,000 tonnes of soil was cleaned at our soil recycling centre GRC Zolder.

### HOFMANS – LEBBEKE

We won a remediation project to clean a historically polluted industrial site in Lebbeke. The former felt manufacturer used mercury in the manufacturing process, therefore our specialists have to purify the groundwater and treat approximately 6,000 m<sup>3</sup> of polluted soils. This factory is the last of its type in Flanders. Preliminary studies and permitting procedures are underway and remediation is due to start in Q4, 2022.



### COKE WORKS – GRIMBERGEN

DEME Environmental was awarded a major remediation contract for a former coke works in February 2021. Located in Grimbergen, on the Brussels-Scheldt sea canal, the 'Cokeries de Brabant' coke works were originally established in 1927 and closed in 1973. They were later demolished, however, the contaminated residue and materials were used to backfill and raise the site. Then an oil depot was built there, which was in operation until 2006.

Following a comprehensive remediation, this heavily contaminated land will be transformed into a multimodal logistics centre. In 2017, the Flemish Waterways Authority launched a market consultation for granting a long-term concession for the project including the obligation for the new concessionaire to remediate the site. A consortium having DEME as subcontractor won the tender, and our responsibility includes the preparation and execution of the remediation work.

DEME financed all of the soil surveys and the remediation study itself during the tender process. As well as the survey, we conducted further in-depth investigations to map out the contamination profile. Our evaluation revealed that the most benefit could be gained from a risk-based approach. We are particularly focusing on excavating the contaminated hot spots that impact the groundwater. In addition, the canals outside the site of the former coke works will be excavated and the sludge will be removed for processing. Our specialists will immobilise the contamination so the soil can be transported to a landfill following pre-treatment.

This is a perfect example of turning a brownfield site into a sustainable and future-proof use of space. Additionally, the new multimodal centre will feature LED lighting, solar panels and high-quality insulation.

In 2021 a more detailed design was developed and we started the permitting procedures. We expect to receive the soil remediation permit during 2022, so we can start the execution of the works in the second half of the year.

## BELGIUM – ANTWERP

Our environmental specialists are working on the second phase of the historically-polluted Blue Gate brownfield site.



### FORMER RENAULT SITE – VILVOORDE

An important project to perform the environmental remediation of a former Renault site in Vilvoorde is in full swing. Once fully remediated, this large factory site, which was closed down 23 years ago, will be turned into a new, 60 ha city quarter.

In 2021, we demolished a massive area of concrete paving where the new cars used to be parked. The Renault plant was built on a household waste dump, so our team is busy excavating, sorting and sieving all the material that needs to be remediated. Over the entire project we expect to handle around 90,000 m<sup>3</sup> when it comes to a close in 2023.

As the site is situated very close to the city of Vilvoorde, strict air emission regulations are in place. We have developed a tailor-made monitoring system to make sure the emissions do not reach the city.

We are deploying bioremediation techniques, but if the soil is too contaminated it will be taken to our own recycling facility. During this project we are aiming to reuse as much of the material as possible – likely to be at least 80%.

### BLUE GATE - ANTWERP

Currently, we are still working on the second phase of the historically-polluted brownfield site, which is being transformed into a sustainable business park. Our scope includes soil remediation, raising the terrain and infrastructure works. Under phase two, we are cleaning up a heavily polluted, 2 km long canal on the former petroleum site. This phase will be concluded in the summer of 2022 and then we will immediately start the third and final phase. In total, DEME handled 600,000 m<sup>3</sup> over the year.

Located in Antwerp's old petroleum harbour, the Blue Gate Antwerp project was originally awarded to the Blue O'pen Consortium (DEME and sustainability specialist BOPRO) in 2016. The redevelopment of the whole terrain will run until the end of 2036.

### CALLEMANSPUTTE - GHENT

Remediation of the 22 ha 'Callemansputte' dredging disposal site is progressing well. Acquired together with our joint venture partner, the dredging disposal site is adjacent to the former gypsum dump of Nilefos in the Port of Ghent. Most of the activities in 2021 involved installing vertical filters to drain the dumped material. The drying and compacting process is expected to take three to four years.

This site will eventually be turned into a nature reserve, including several lakes and bird-watching hides. In 2018, we fully remediated the gypsum dump and a new 15 MW solar farm has already been established, producing green energy for 4,000 households.

### BP - HOBOKEN

Remediation works at BP's former Hoboken lubricants' production plant were successfully completed in October 2021. Around 85,000 tonnes of contaminated soil were treated during the project. Our client will transform the BP site into 'Maritime Campus Antwerp' for sustainable and water-related businesses. Again, a black spot has been turned into remediated land.

In a special initiative we deployed a remote-controlled barge to transfer the contaminated material from the site to our recycling centre in the Port of Antwerp. This is believed to be the first time such a barge has been deployed in Europe at such a large scale.

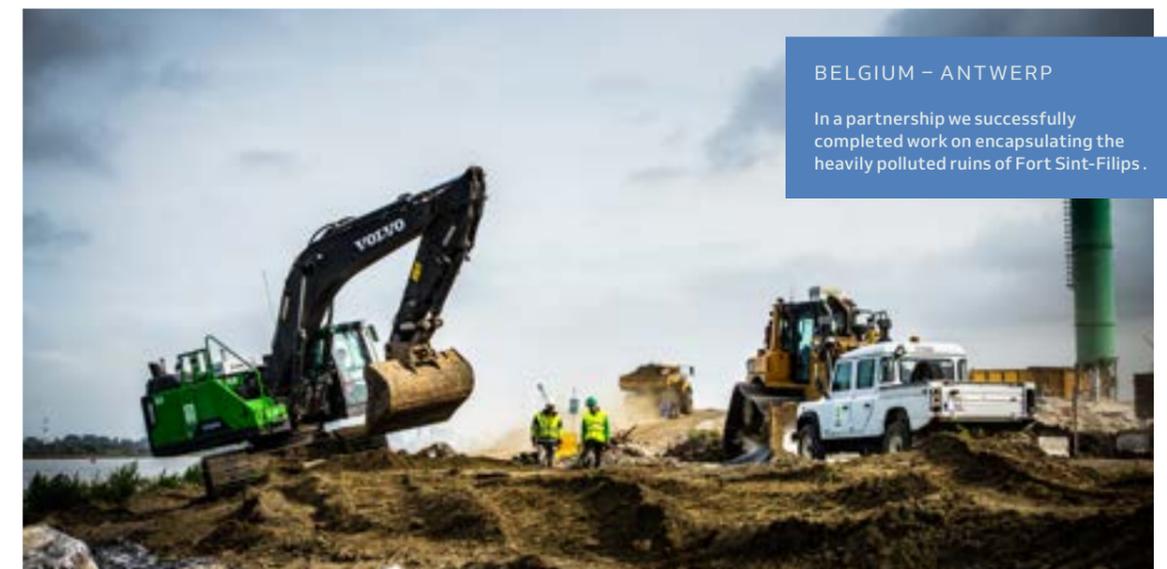
### FORT SINT-FILIPS - ANTWERP

In the largest rehabilitation project in the Port of Antwerp ever, DEME Environmental and its consortium members, successfully completed work on encapsulating the heavily polluted ruins of Fort Sint-Filips in September 2021.

After WWII the old 19<sup>th</sup> century fort served as a dumping ground for millions of litres of oil and chemical waste, as well as an incineration plant for waste products between 1950 and 1970.

The 31 ha area had been buried under this layer of sand. Once this layer was removed, we encased the fort in an underground cement-bentonite wall, thereby completely isolating the contamination. The dump was then filled and capped with an impermeable top layer of film and clay mats and finished with pure topsoil.

As the banks of the fort are also part of the Sigma flood protection plan, the height of the dykes was increased and a new revetment area was built along the riverbank.

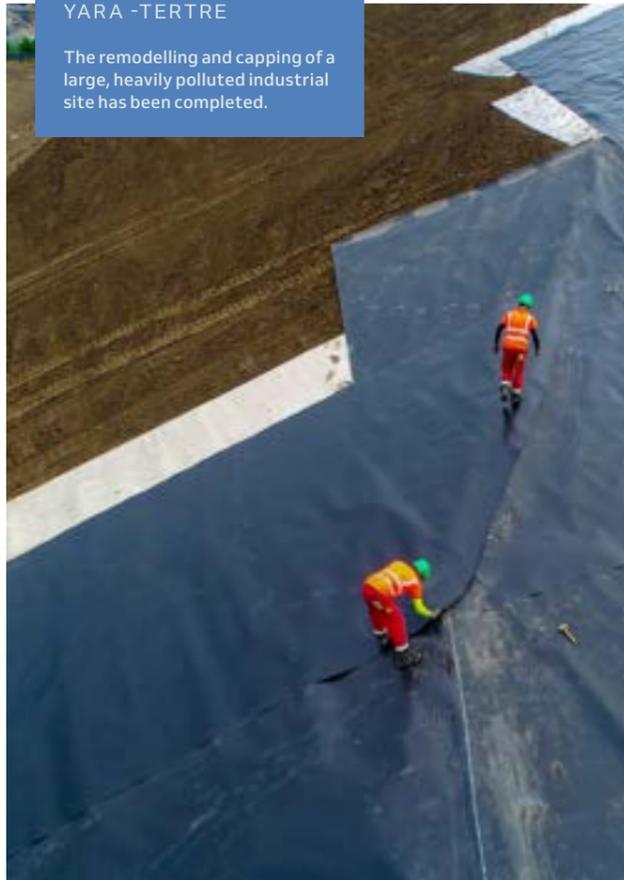


## BELGIUM – ANTWERP

In a partnership we successfully completed work on encapsulating the heavily polluted ruins of Fort Sint-Filips.

**YARA -TERTRE**

The remodelling and capping of a large, heavily polluted industrial site has been completed.

**YARA TERTRE**

The remodelling and capping of a large, heavily polluted industrial site at the Yara Tertre chemical plant has been completed. This complex, four-year project represents a great example of recycling and the reuse of cleaned material. It involved both the removal and treatment of polluted soil and capping a large landfill with geotextile HDPE membranes and finally this was topped off with the reused, treated soil. Over the years we handled more than 1 million tonnes of polluted material.

**TEC - OMAL AND GENSON**

Remediation works on two old tank stations (Omal and Genson) on behalf of TEC, the Walloon public transport authority, were completed in 2021. We carried out offsite biological treatment at our specialist centre of approximately 20,000 tonnes.

**SERAING AND MONTIGNIES SUR SAMBRE**

For a longstanding client, Spaque, we performed the simultaneous remediation of two former industrial sites, one in Seraing (Ateliers Centraux) and one in Montignies sur Sambre (Lumat site). Together the two sites represented approximately 50,000 tonnes of polluted soil.

**REHABILITATING OLD QUARRIES**

Our subsidiary Ecoterres is one of the shareholders of La Vêlorie, a company set up to rehabilitate an old quarry in Tournai, and turn it into an ecological zone. This project, which covers a 6-ha site, started in 2017 and is set to run for several years. We are performing backfilling work and depositing cleaned soil to transform the quarry into a nature reservation. Since the project began we have handled around 800,000 tonnes of soil.

Together with our joint venture partner we are transforming a 13-ha quarry in Wérisol, near Liège. In this 10-year project we will backfill and cap the former quarry. The site is lightly polluted by municipal waste and will be redeveloped into a new business park. Following severe floods in the Liège region in July, the site was requisitioned by the public authorities to allow the temporary storage of 50,000 tonnes of waste coming from road and river cleaning.

**BASF - FELUY**

We are aiming to start works on the brownfield site in 2023. A PPP has already been established between Ecoterres, a public works company and a local intercommunal company 'Idéa'. This PPP will be responsible for the purchase and redevelopment of the site.

**THE NETHERLANDS****MILIEUPARK OOST**

Work is ongoing to upgrade de Vries & van de Wiel's 'Milieupark Oost' and turn it into a modern and innovative soil and sludge recycling and treatment centre. The facility handles onshore and offshore waste, such as cuttings and mud for the Dutch exploration and production company NAM and water-based muds from geothermal drilling.

**SCOTLAND****FORMER OIL TERMINAL - BOWLING**

Under an Early Contractor Involvement (ECI) agreement, we are preparing to start works on a contract to remediate a former oil terminal in Bowling. This project highlights our focus on promoting a sustainable and circular economy.

Located on the banks of the River Clyde, the Bowling site is approximately 40 ha and is heavily polluted with oil. With a keen focus on sustainability, more than 90% of the material - if not more - will be cleaned and reused, in line with the stringent requirements of the Scottish Environment Protection Agency (SEPA) and our client. Around 400,000 tonnes of soil has to be excavated and of this 100,000-150,000 tonnes is likely to undergo soil washing treatment.

Other environmental considerations are in place. As the location is situated so close to the River Clyde, there is a big tidal range of 2 m - 5 m. When the tide is low, birds flock to the mudflats therefore restricted working times are in place so our team doesn't disturb them. The site is also monitored by ecological specialists and has been designated a site of archaeological interest.

A close-knit client-contractor relationship is making it easier to achieve the very high standards required. DEME Environmental was awarded this contract soon after the successful completion of a four-year refinery remediation project for the same client in Tønsberg, Norway.

On completion of this extensive remediation project, the Bowling site will be transformed into an industrial and commercial development and part of the land is also earmarked for a new road.

## NORWAY

### TRANSFORMATION OF LANDFILL SITE NEAR BERGEN

DEME Environmental was awarded a very complex project from the Municipality of Bergen in Norway, where it will excavate an old landfill site in Slettebakke and clean the material for reuse and recycling. Representing volumes of around 200,000 tonnes, we will backfill the site so that it's ready for future development. It will eventually lead to an extension of the city of Bergen spanning 30-35 ha.

Again this project highlights our ability to provide sustainable solutions. At least 75% of the material will be reused directly and the remainder will be treated.

The team will excavate the site selectively, verify the material and treat it, deploying our soil washing installation. DEME is performing the works together with Veidekke ASA, the same joint venture partner we worked with during the previous ExxonMobil project in Norway.

We initially won the first tender based on a Bill of Quantity where the joint venture scored points on both the technical solution and the price. Then under an Early Contractor Agreement, the team was also given the responsibility for the full design of the remediation works.

Our client, the Municipality of Bergen, recognised that this is an extremely complex project given the heterogeneity of the contamination and uncertainty regarding the volumes that need to be treated. Additionally, the location is right on the outskirts of the city, so logistics are also complicated.

Following the preparations and permitting phase, this project is expected to kick off in Q2, 2022.



## HYBRID SOIL WASHING PROCESS FOR PFAS CLEANING - AN INDUSTRY FIRST IN BELGIUM

**In an industry first in the Belgian market, we handled some 35,000 tonnes of PFAS-polluted material at our soil washing installation GRC Kallo from the former General Motors site in Antwerp, on behalf of the Flemish government. As a front runner in PFAS remediation, we have equipped all of our 12 recycling centres with a water purification plant to treat polluted PFAS waters.**

This follows on from a pioneering new hybrid soil washing process DEME's subsidiary de Vries & van de Wiel has developed in the Netherlands, together with its partner Tauw. Our special soil washing process achieves an impressive cleaning yield of more than 99% and complies with the latest Belgian and Dutch regulations. The innovative method is a hybrid version of the wet extractive cleaning process, which, in addition to fraction separation, focuses on purifying the wash water. Once the contaminants are removed, the material can be turned into filter cakes.

PFAS (a collective name for poly- and perfluoroalkyl substances) is found

in many household products. Due to their wide use and multitude of applications, PFAS has a significant impact on the environment and is also present in soil. In 2019, this prompted very strict soil standards in the Netherlands and has also led to project delays in some cases.

### MOBILE GROUNDWATER TREATMENT INSTALLATIONS FOR PFAS CLEANING

The techniques used in our soil recycling centres for cleaning PFAS polluted water were used to develop standard groundwater treatment installations for PFAS cleaning.

All of our own recycling centres were equipped with such an installation, so that they are able to handle PFAS-contaminated soils and sediment and the polluted water can then be treated.

Additionally, if requested, we have the capability to place similar installations at clients' sites.

# DREDGING, SEDIMENT AND WATER TREATMENT

## BELGIUM

### NYRSTAR, BALEN

In Balen, we continue to perform activities involving the dehydration of Nyrstar's process residue, including tailing management and dewatering, as well as making filter cakes from the material.

### FLEMISH INLAND WATERWAYS

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

### 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.

### WALLOON WATERWAYS

In a joint venture, Ecoterres was again awarded a four-year framework contract from the Walloon Waterways authority in April 2021, following a public tender. Some 75,000 m<sup>3</sup> was dredged by Ecoterres during 2021.

### SOIL AND SEDIMENT TREATMENT CENTRES

Our soil and sediment treatment centres were very busy in 2021, underlining our strategy to boost our presence in this activity some 10 years ago. Given their success, we are aiming to establish a fourth centre near Liège. We are in the process of purchasing the former industrial site and then we will remediate it and set up a new treatment centre there. Alongside this, our permit at the Sedisol centre has been awarded again and we intend to extend this site, enabling us to use new treatment methods. Once completed, we will be able to treat some 150,000 m<sup>3</sup> annually.

We have also opened our first recycling centre in France in Wambrechies. Perfectly located along the River Deûle, this is the first step and we hope to develop the centre in the coming years. The location means that it is ideal to transport the soils/sediments by river, dramatically reducing CO<sub>2</sub> emissions and fitting in with our sustainability vision.

### BOREALIS - ANTWERP

We completed a major design, engineer & build contract for the chemicals giant Borealis in 2021. Borealis is currently building a new propane dehydrogenation unit at its facility in Antwerp and we were awarded the contract package to deliver a demineralised water plant. As part of the scope, we designed and engineered the reverse osmosis and electro deionisation unit.



## FRANCE

We have been awarded multiple new dredging contracts from Voies Navigables de France (VNF) for the Deûle/Escaut rivers, Strasbourg and the Grand Gabarit canal. Under a joint venture, the total volume to be dredged and managed (in our own centres in Belgium or an external site in Northern France) is 600,000 m<sup>3</sup> over a period of four years. VNF has already sent us a recommendation, notifying us that they are very happy with our performance.

### CONDÉ-POMMEROEUL CANAL

The basin installation works on the VNF Condé-Pommeroeul Canal project were successfully finished off in 2021, marking the completion of phase 1. Around 350,000 m<sup>3</sup> of sediments have been dredged and pumped into the new basins, deploying our in-house designed unloading system. Given that this is currently the largest dredging project on the inland waterways in France and has to handle huge volumes, we designed this tailor-made unloading system for transferring the sediment from the barges to the disposal sites. This pioneering equipment - believed to be the only one in Europe able to handle such volumes - has very high productivity rates of more than 2,000 m<sup>3</sup> per day. It sieves the material using high density pumps and can easily handle sediments with different physical characteristics. One of the basins has already been completely backfilled.

This multi-year project will lead to the reopening of a 6-km section of the canal between the Belgian border and the city of Condé in Northern France.

### DUNKERQUE

We continued performing maintenance dredging in Dunkerque with our joint venture partner to the full satisfaction of our client. More than 25,000 m<sup>3</sup> of sediment was handled during the year. ♻️



FRANCE – CONDÉ-POMMEROEUL CANAL

The multi-year inland dredging project will lead to the reopening of a 6-km section of the canal.

## TREATMENT CENTRES IN BELGIUM, THE NETHERLANDS AND FRANCE

With several soil and sediment recycling centres in Belgium, the Netherlands and France, our environmental specialists treated 1.55 million tonnes of polluted soil and dredged sediments in 2021, making DEME a leading company in this specialised activity. We also have 40 mobile and fixed water treatment plants.

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## INFRA



DEME Infra specialises in marine infrastructure and civil works that complement and reinforce DEME's dredging, land reclamation and offshore 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, concrete (gravity based and floating) foundations for offshore renewables, and civil works for harbour construction, dams and sea defences, canal construction, revetment, quay wall construction and shore protection.

## THE NETHERLANDS

### BLANKENBURG CONNECTION

Highlighting the enormous scale of the Blankenburg Connection project, the BAAK EPCM joint venture, including DEME and combining our dredging and infra expertise, worked day and night pouring all of the underwater concrete into the tunnel approaches of the 825 m immersed Maasdelatunnel. In a staggering achievement the team eventually poured 50,000 m<sup>3</sup> of precast concrete, which represents 20 Olympic-sized swimming pools. Meanwhile, at the Holland Tunnel (the land tunnel) the team poured the underwater concrete for the cut and cover section, adding another 10 Olympic-sized swimming pools of concrete.

The A24 'Blankenburg Connection' connects the A20 to the A15 and improves access to the Rotterdam region. The BAAK consortium, which

comprises DEME Concessions, Ballast Nedam Concessions and Macquarie Capital, was awarded the contract on a design, build, finance and maintenance basis and it will run for a period of 20 years.

BAAK's 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.

In another major milestone in 2021, 18 decks for Viaduct 21 were completed on schedule for the main road intersection 'Knooppunt Rozenburg'. In the meantime, the joint venture created BAAK's stock mountain, aptly named 'Blankenberg' (Blanken mountain), by relocating 500,000 m<sup>3</sup> of excavated soil. This stockpile will be used for the future landscaping of the site.

Two in-situ decks were also constructed over the A15 highway using a 'table construction', so there was minimal hindrance to traffic.

The tunnel elements are being constructed in a drydock nearby and before the year-end, all the floor sections, mid-tunnel and inner wall sections had been cast, completing approximately 85% of the total 45,000 m<sup>3</sup> of concrete works. These sections, which weigh 56,000 tonnes each, are approximately 200 m long and 8 m high and are extremely complex to build because they are curved. Once prepared, they are taken out of the drydock and placed in floating storage until they can be immersed.

At the A20, the existing viaducts Vlaardingervaart and Lepelaarsingel, were widened, again without disrupting the traffic.

### Innovative robot plotter

In a remarkable innovation, 230,000 boreholes have to be marked so the vertical reinforcement bars can be accurately placed in between the reinforcement cages in the poured underwater concrete of the building pits, which are no longer visible. The locations of the boreholes are optimised by adjusting the theoretical drilling points to the actual positions of the rebar cages. This would normally have to be done manually and would take months, but thanks to DEME Infra's ingenious invention, the team has developed a special robot plotter which can detect and scan the cages to make sure the boreholes are drilled in the right place.

### NEW LOCK TERNEUZEN

The Sassevaart joint venture, including DEME, managed to keep the New Lock Terneuzen megaproject on track during the year by deploying a range of mitigation measures, whilst adhering to strict COVID measures. Despite the impact of the pandemic, the team achieved several major milestones. The concrete works in the inner and outer lock heads, which include formwork, steel fixing and pouring the concrete, are ongoing.

At 427 m long, 55 m wide and 16.44 m deep, the New Lock is being built in the middle of the existing Terneuzen locks' complex, between the West and East locks. The lock heads are particularly complex from an engineering point of view because of their geometry and the limited space at the site. The four new lock gates, which have to be installed between the walls in the lock heads, are 58 m high and weigh around 1,600 tonnes each. The gates and two lock bridges of 83.3 m will be transported from PJOE in China to the Netherlands in 2022 and installed later that year.

### Bottom grids immersed into lock chamber

Additionally, highlighting the DEME's multi-skilled team, the excavation of the lock chamber was completed by our dredging specialists and then two concrete bottom grids (57 m x 17 m x 5 m, weighing 4,500 tonnes), for the lock chamber were successfully immersed in November, under the supervision of DEME Infra. These grids provide the means by which the water level inside the lock will be regulated.

As a dry in-situ construction of the grids was considered too risky, the DEME Infra immersed tunnel specialists came up with an innovative solution to prefabricate and install them as if they were immersed tunnel elements. This specialist expertise is also in the spotlight at





#### NEW LOCK TERNEUZEN – THE NETHERLANDS

Despite the impact of the pandemic, the project team made significant progress.

several megaprojects in DEME's portfolio such as the Fehmarn Belt Fixed Link, Blankenburg Connection and Scheldt Tunnel, which is part of the Oosterweel link project in Antwerp.

Showing that sustainability is always a key focus, the team also started the demolition of the existing Midden Sluis (Middle Lock). The material from this lock will be recycled and used for new roads along the New Lock complex, leading to a substantial reduction in emissions. Dismantling the lock will take more than a year to complete.

As well as this, the concrete works were finished off in the service port. A Dutch-Belgian joint venture Sassevaart, comprising DEME, was awarded a design and construct contract for the New Lock, which will provide better access to the ports of Ghent and Terneuzen.

#### RIJNLANDROUTE

In a major landmark at the RijnlandRoute, the eight crossing passages (used in the case of an emergency evacuation and for maintenance activities), which connect the two tunnel tubes, were successfully installed. The RijnlandRoute is a new road connection from Katwijk, via the A44, to the A4 at Leiden.

Nearly all of the civil activities were ready by the end of 2021, as were the flyovers for the A4.

Most of the important milestones for the A44 were also completed. Work has progressed well, despite the impact of COVID.

The COMOL5 joint venture was awarded a design & build contract in 2017, plus a 15-year maintenance contract for the RijnlandRoute. COMOL5 (DEME Infra, 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 the 2.2 km bored tunnel.



#### NEW LOCK TERNEUZEN – THE NETHERLANDS

The four new lock gates, which have to be installed between the walls in the lock heads, are 58 m high and weigh around 1,600 tonnes each.

## CIVIL MARINE WORKS IN THE NETHERLANDS

### New Jetty 6/7 Koole KTB, Rotterdam

DEME Infra delivered a new jetty for seagoing and inland vessels to the Port of Rotterdam. This jetty, situated at the Botlek Harbour, has a total length of 450 m, and is made of tubular steel piles with concrete platforms on top. To protect the jetty, a steel piled fendering construction was placed around it with mooring dolphins. Additionally, 'lean' scheduling techniques were used to optimise the lead time.

### Replacement of existing mooring facilities in the South of the Netherlands

At the end of 2021, DEME Infra started replacing existing mooring facilities at six locations around locks in the South of the Netherlands. This design & build contract for the Directorate-General for Public Works and Water Management (Rijkswaterstaat) is due to be completed in 2022. Several materials, such as steel and wood, will be reused in the new structures.

### Civil structures for tank storage terminal Rotterdam-Europoort

For a private client active in the petrochemical industry, DEME Infra built the civil structures for a new tank pit for a tank storage terminal. The project was awarded through a so-called 'Bouwteam' contract, where the client, contractors and other advisors work closely together. In the first phase, the design of the civil structures and the preparation of the construction site were completed based on deductible man hours, equipment and quantities. In the second phase, the construction of civil structures is awarded after an open book negotiation of DEME's estimation of the completed design. The project was recently handed over to the client.

## BELGIUM

### OOSTERWEEL LINK

DEME was delighted to win a second contract for the prestigious Oosterweel link project, which will complete the Antwerp Ring Road. In 2020, the 'Tijdelijke Maatschap Combinatie Oosterweeltunnel' (TM COTU) (including our dredging and infra specialists) was awarded the 'jewel in the crown' - the Scheldt Tunnel contract - from developer LANTIS.

Eight tunnel elements of approximately 60,000 tonnes each will be built in the inner port of Zeebrugge and then towed to Antwerp via the North Sea and the Western Scheldt, where they will be immersed in a pre-dredged trench in the River Scheldt.

In 2021, design and preparation activities for the 1,800 m Scheldt Tunnel and construction dock were well underway. Then on August 25, the team was also awarded the Oosterweel connection Lot 3b for the Right Bank.

This was awarded via a new, collaborative engineering contract form being used in Belgium for the first time - a NEC4 contract - where a target cost is initially established and several work packages determined. DEME and the client work closely together to 'shape' the contract and formulate an estimated target price. The various parties can jointly manage decisions, which speeds up the process considerably and makes it more cost efficient. This 'gain/pain sharing' contract is deployed to manage very complex, large-scale infrastructure projects.

During the year, the team was busy with design activities and the preparation of the first packages for the replacement of the cables and ducts.

The NEC4 contract is largely expected to be the way forward in the future. DEME Infra is well able to manage different contract forms, such as NEC4 and Bouwteam, in addition to the traditional Design & Build contracts.

## DENMARK - GERMANY

### FEHMARNBELT FIXED LINK

Heralded as the infrastructure project of the century, work has officially begun at both ends of the Fehmarnbelt Fixed Link project. Connecting Denmark with Germany, at 18 km, the Fehmarnbelt Fixed Link will be the longest immersed road and rail tunnel in the world. Up to 9 m high and 43 m wide, the tunnel is due to be completed in 2029.

2021 was a crucial year for this historic project. On January 1<sup>st</sup> work started in Denmark, and then in December, construction had officially kicked off in Puttgarden in Germany as well. As a member of the Femern Link Contractors Joint Venture, DEME is delighted that the project is solidly progressing in both countries.

#### Production facilities for tunnel elements

In Denmark, the integrated joint venture team started work on one of six enormous production facilities in Rødby where the huge tunnel elements will be constructed. Part of this facility is underwater as the tunnel elements will be floated, before they are transported and immersed in the pre-dredged trench. Eventually 89 elements will be installed, 79 of which are 217 m long.

Alongside this, the JV team is building the site offices and the foundations for 'The Village', which will eventually accommodate 1,400 workers. This facility, which has an onsite COVID testing centre, is within 2 km of the tunnel entrance. The total site where the tunnel elements are being produced is around 2.5 km x 1.5 km, highlighting the scale of the project.

Around 500 people have already been mobilised for the preparatory works. But when the tunnel element construction and marine works get fully underway, at least 2,000 people will be employed there.

### DENMARK - FEHMARNBELT FIXED LINK

Work started on the work harbour and production facilities in Rødby where the tunnel elements will be constructed.





## DENMARK

89 tunnel elements will be constructed and installed, 79 of which are 217 m long.

**Leading the marine works**

DEME is involved in all aspects of the project but it is leading the marine works. These encompass the preparation of the trench for the tunnel, the gravel bed foundations and then the DEME experts have to sink the tunnel elements in the trench and connect them with each other, before carrying out the backfilling. The project is another opportunity to deploy DEME's expertise in immersed tunnels and large-scale infra marine projects.

The Femern Link Contractors Joint Venture is responsible for the execution of three contracts. Two cover the construction of the immersed tunnel and the production facility that will manufacture the precast tunnel elements and a third contract deals with the portals and ramps for connections to the existing motorways and railways further inland. The trio of contracts have a combined value of 3.4 billion euros.

**Managing the 'train of activities'**

Undoubtedly, as well as the scale, the Fehmarnbelt Fixed Link is an enormous logistical challenge, especially when it comes to managing the 'train of activities'. The production facilities will be operational 24/7 and then once a tunnel element is produced it has to be immersed, but for that to take place the trenching has to be ready and all the preparation works have to be completed. Then the backfilling can begin. DEME managers are in key positions, leading both the marine works and the project control teams.

**New technologies**

Several innovations are being introduced in this complex project, highlighting DEME's expertise. An important one from a safety perspective is that the JV will avoid the use of divers by using specific, newly-developed marine equipment for the installation of the gravel bed, similar to technology DEME used at the TTP1 megaproject in Singapore. Additionally, DEME is the front runner in designing and developing special pontoons for the immersion of the tunnel elements. There is also an automated system for the fabrication of the steel reinforcement cages for the tunnel elements, which are made up of seven sections.

The joint venture comprises Dredging International NV, VINCI Construction Grands Projets S.A.S., Per Aarsleff Holding A/S, Solétanche-Bachy International S.A.S., CFE NV, Wayss & Freytag Ingenieurbau AG, Max Bögl Stiftung & Co KG, BAM Infra BV and BAM International BV.

The 18 km tunnel connects Denmark's Lolland Falster region with Germany's Schleswig Holstein region, and is expected to foster trade and tourism in Northern Europe for the generations to come. It will shorten the journey between the German and Danish coasts to just 10 minutes by car and seven minutes by train, compared to the current travel time of one hour by ferry or a 160 km detour via the Danish region of Jutland by car. 🌱

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## DENMARK - GERMANY

At 18 km, the Fehmarnbelt Fixed Link will be the longest immersed road and rail tunnel in the world.

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**DEME  
CONCESSIONS**



# DEME CONCESSIONS

DEME Concessions oversees the Group's broad-ranging and diverse concessions in the fields of renewables (wind, wave and tidal), marine infrastructure and ports, dredging, green hydrogen, and special projects. Established in 2013, DEME Concessions enables us to develop long-term and lasting partnerships, create regular activities for the Group and indeed, generate value and recurrent profit for our shareholders. DEME Concessions also provides equity, project finance and specific knowledge to support our core activity lines.

## RENEWABLES

### RENTEL OFFSHORE WIND FARM - BELGIUM

The 309 MW Rentel offshore wind farm, located in the Belgian North Sea, is performing technically well, with high availability, but unfortunately lower than predicted wind conditions. Commissioned in March 2019 and representing a total investment of EUR 1.1 billion, DEME Concessions has developed the wind farm in a consortium with eight Belgian shareholders, including DEME's longstanding partners in Otary. Rentel is providing 300,000 families with renewable energy, leading to a CO<sub>2</sub> reduction of 362 kilotonnes per year.



The Rentel and SeaMade offshore wind farms provide renewable energy to 800,000 households.



The SeaMade offshore wind farm was officially inaugurated in attendance of Belgium's Prime Minister Alexander De Croo.

### SEAMADE OFFSHORE WIND FARM - BELGIUM

Named the jewel in the crown of the Belgian offshore wind market, DEME Concessions has a substantial participation in Belgium's largest wind farm, SeaMade, which has a capacity of 487 MW. This large-scale wind farm provides renewable energy to 500,000 families and represents a CO<sub>2</sub> reduction of 600 kilotonnes per year. We successfully completed the construction on schedule, in just 16 months, including the foundations, inter-array cables, offshore substations, export cables and rock placement. Achieving its commercial operation date at the end of June, SeaMade was officially inaugurated in October.



### C-POWER WIND FARM - BELGIUM

C-Power is the first offshore wind farm in the concession area on the Thornton Bank in the North Sea, which is 30 km from the Belgian coastline. With a total installed capacity of 325.20 MW, the 54 wind turbines generate about 1,050 GWh per year, enough to provide 300,000 families with renewable energy. This results in a reduction of CO<sub>2</sub> emissions which is equivalent to 415 kilotonnes per year. Faced with challenging conditions due to the bankruptcy of the turbine supplier Senvion in 2020, C-Power managed to establish a self-maintaining organisation and keep to the budgeted availability levels.

DEME Concessions is broadening its portfolio of offshore wind farm developments outside of Europe.

### VINH PHONG OFFSHORE WIND PROJECT - VIETNAM

Highlighting how DEME Concessions is broadening its portfolio of offshore wind farm developments outside of Europe, there were some important developments in 2021.

In May, DEME Concessions signed a Memorandum of Understanding (MOU) to develop a 1,000 MW wind farm in the Binh Thuan Province in Vietnam, known as the Vinh Phong offshore wind project. This will be the first offshore wind farm in Vietnam.

The MOU is a clear statement of intent, with the consortium partners aiming to realise the project in two phases (600 MW and 400 MW). The consortium's ambitious plan to develop, finance and construct this pioneering offshore wind

farm was announced on April 27, at the Institute Of Energy's international workshop in Hanoi.

DEME Concessions is keen to support Vietnam as the country embarks on its journey to develop this new industry and create and extend the local supply chain, in line with the country's Power Development Plan (PDP8). Through its dredging activities, DEME has been active in Vietnam since 1995.

The Binh Thuan Province authorities have expressed their keen interest in the implementation of the offshore wind project and have already provided support to the consortium by allocating a site for the new wind farm.



## INFRASTRUCTURE

### BLANKENBURG CONNECTION - THE NETHERLANDS

DEME and its consortium partners have been busy constructing the Blankenburg Connection throughout the year (see page 130). The Blankenburg Connection connects the A20 and the A15 through an immersed tunnel, and will improve access to Rotterdam. It is the largest infrastructure project in the Netherlands and represents a contract value of EUR 1 billion. Rijkswaterstaat (Directorate-General for Public Works and Water Management of the Netherlands) awarded the PPP project to the BAAK Consortium (DEME Concessions, Ballast Nedam and Macquarie Capital) in 2018. The project includes the design, build, finance and maintenance of the Blankenburg Connection for a period of 20 years.

### PORT-LA NOUVELLE - FRANCE

As part of a consortium, DEME Concessions started a 40-year port concession for Port-La Nouvelle on May 1<sup>st</sup>, 2021. The concession company is a Public-Private-Partnership named SEMOP PORT LA NOUVELLE. This concession directly fits in with the DEME Group's ambitious sustainability goals because the French port is undergoing a major redevelopment, which includes establishing a strategic hub for the offshore- and floating wind industry.

DEME is also busy at the port and finalised dredging and construction works for a 200 m quay wall for a new heavy lift terminal (see page 130). As from 2022, this facility will be used as an offshore wind turbine construction and assembly site. Furthermore, DEME will construct all the marine infrastructure and perform the dredging works for a major, new outer port.

SEMOP PORT LA NOUVELLE is a very innovative management structure for a commercial port in France and brings together the Regional Council and the public Banque des Territoires with a consortium of private investors and operators. The private shareholders have a 51% share.

Located south of Narbonne, Port-La Nouvelle currently handles around 2 million tonnes a year, including liquid bulk, dry bulk, raw materials and semi-finished products. With a newly dredged depth of -16 m, the port will be able to accept much larger ships and welcome new activities such as offshore wind power, the maintenance of offshore wind farms, the production of green hydrogen and the storage of renewable energies. In the newly created outer port, new terminals will be created (offshore, liquid and dry bulk), as well as an industrial zone.

With the deep-sea infrastructure, new terminal facilities, rail distribution capacity to Europe and innovative management, the future port of Port-La Nouvelle aims to become the regional blue economy hub, in turn supporting the energy transition in France.



As part of a consortium, DEME Concessions was awarded a 40-year port concession for Port-La Nouvelle in France.

### PORT OF DUQM - OMAN

Several key milestones were reached at the Port of Duqm in Oman, where DEME Concessions is in a partnership with Port of Antwerp International and the Government of Oman. The partners hold the port concession and are responsible for port authority functions, commercial operations, and landlord activities.

In 2021 the liquid bulk berths have been commissioned and an agreement with the future operator of the facility has been inked. Additionally, DEME Concessions has begun the process of attracting an international container terminal operator to the new port.

Logistics sites in Duqm are also proving popular. Eighty hectares is already operational and leased out, and a further 70 ha will be levelled in 2022, preparing it for new tenants under a project financed deal.

As well as this, CTOW, in which DEME Group is one of the main shareholders, took over and expanded the marine services in Duqm (see page 90), in a joint venture with Oman's MARAFI LLC and PODC SAOC, named Combined Marine Terminal Operations Marafi LLC (CTOM).

One of the first moves was to bring in a much-needed, 85-tonne bollard pull tug, enabling CTOM to handle very large ships. CTOM is performing towage, pilotage and other marine services for breakbulk vessels, containerships, fishing trawlers and naval vessels in the greenfield port.

## GREEN HYDROGEN

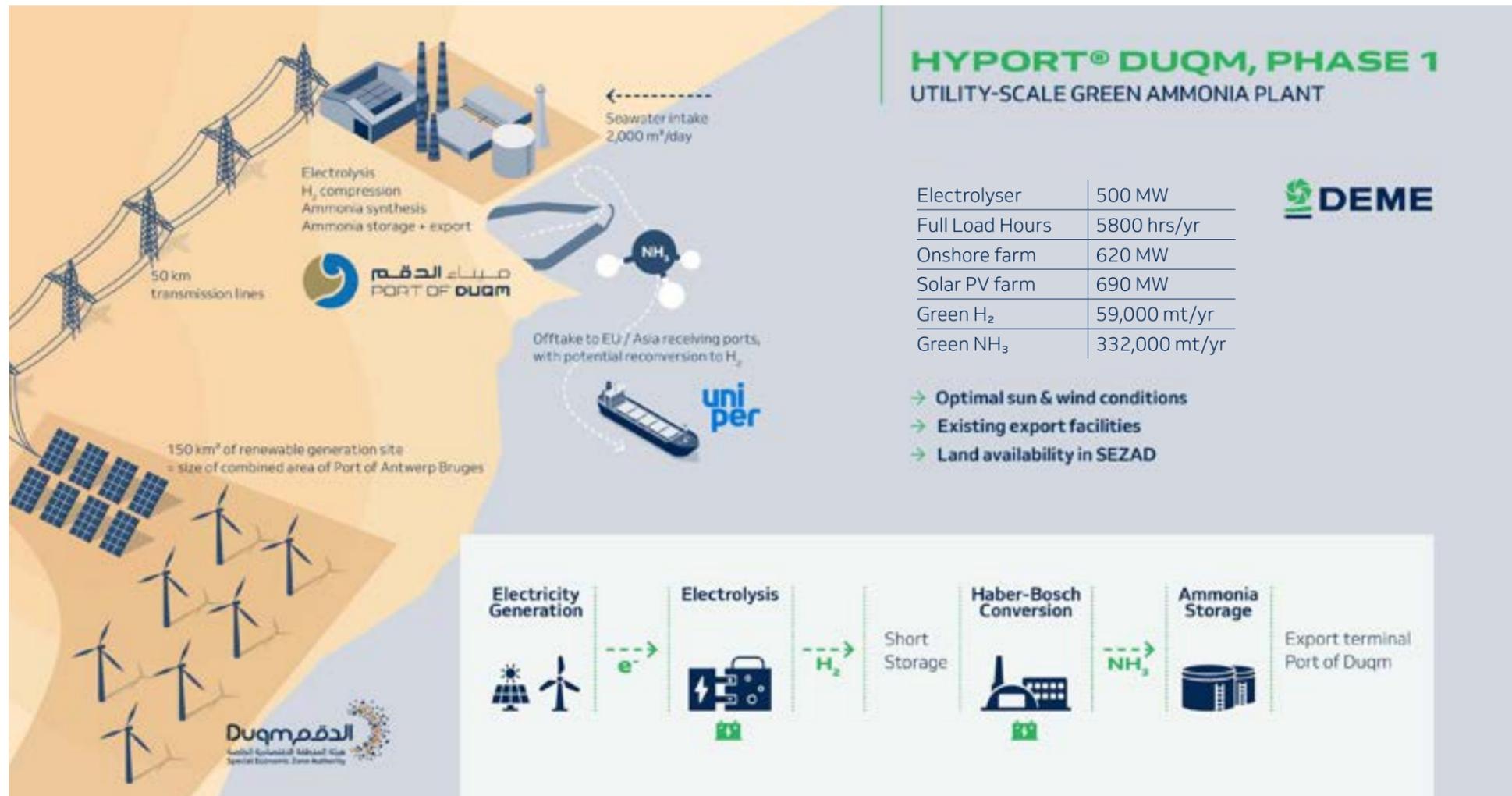
### HYPOR<sup>®</sup> DUQM

Duqm is playing a crucial role in DEME Concessions' ambitions to facilitate the growth of clean fuels and DEME Concessions and its partners will establish an industrial-scale, green hydrogen plant at the port.

This flagship green hydrogen project has developed rapidly in 2021. In July, a cooperation agreement was signed with energy giant Uniper. Under the cooperation, Uniper will be joining the project team to provide engineering services and negotiate an offtake agreement of green ammonia.

With Uniper, HYPOR<sup>®</sup> Duqm's shareholders - DEME Concessions and OQ Alternative Energy - have onboarded a globally recognised and reputable partner, which will support HYPOR<sup>®</sup> Duqm in demonstrating a strong business case for the offtake, and in turn, enable them to secure optimal financing for the project.

**Combining innovative technologies at scale, this is one of the very few projects worldwide which encompass the full value chain, starting with 100% renewable energy.**



This agreement marks another important milestone for HYPOR<sup>®</sup> Duqm, after having secured its 150 km<sup>2</sup> renewable generation site in the Special Economic Zone earlier in the year. During 2021, a whole range of pre-FEED engineering work was taking place and met masts for live sun- and wind data transmission were also installed.

Combining innovative technologies at scale, this is one of the very few lighthouse projects worldwide which encompass the full value chain, starting with 100% renewable energy, the production of hydrogen in electrolyzers and then the conversion thereof to green ammonia.

In the first phase of the proposed 1.5 GW project, HYPOR<sup>®</sup> Duqm will develop a 500 MW (electrolyser capacity) green hydrogen facility. This phase requires around 1.3 GW of renewable energy, however, for the full multi-phase project, between 3 - 4 GW will be required. HYPOR<sup>®</sup> Duqm will connect to Port of Duqm's brand-new export terminal, storage infrastructure and liquid jetties and will use the port as its gateway to deliver competitive decarbonised molecules to users worldwide.

DEME Concessions has taken steps to introduce the HYPOR<sup>®</sup> concept to other strategic locations, where there is plenty of wind and solar resources and enough space for such a development, and importantly, where DEME has a well-established local presence.

### COMBINING OFFSHORE WIND & GREEN MOLECULES IN EUROPE

Separately, DEME Concessions is also looking into opportunities in Europe where there are high levels of offshore wind production in the North Sea and Baltic Sea, and seeing where this renewable energy could be combined with the production of green molecules.

### HYVE - DEVELOPING THE NEXT GENERATION OF ELECTROLYSERS

DEME Concessions is investing in R&D to further push the progress of green hydrogen forward by developing the next generation of electrolyzers. In an important initiative in Belgium, DEME Concessions is participating in a consortium named Hyve. The consortium includes renowned research centres Imec and VITO (both partners in EnergyVille), together with industrial pioneers Bekaert, Colruyt Group and John Cockerill.

Hyve aims to provide the cost-efficient and sustainable production of hydrogen at gigawatt level as Europe makes the transition towards carbon neutral industry.

The Hyve consortium brings together players across the value chain to achieve this ambitious goal, merging expertise in developing new components for electrolysis with material suppliers and integration companies, and companies that will use this innovative infrastructure to generate green hydrogen. 🌱



## SPECIAL PROJECTS

### NIEUWPOORT MARINA II

A business plan to develop a new marina in Nieuwpoort in Belgium, which is set to be the largest in northern Europe, is currently being finalised. Eventually the development will create a new district with more than 1,000 apartments and 500 extra berths.

### ENERGY ISLAND

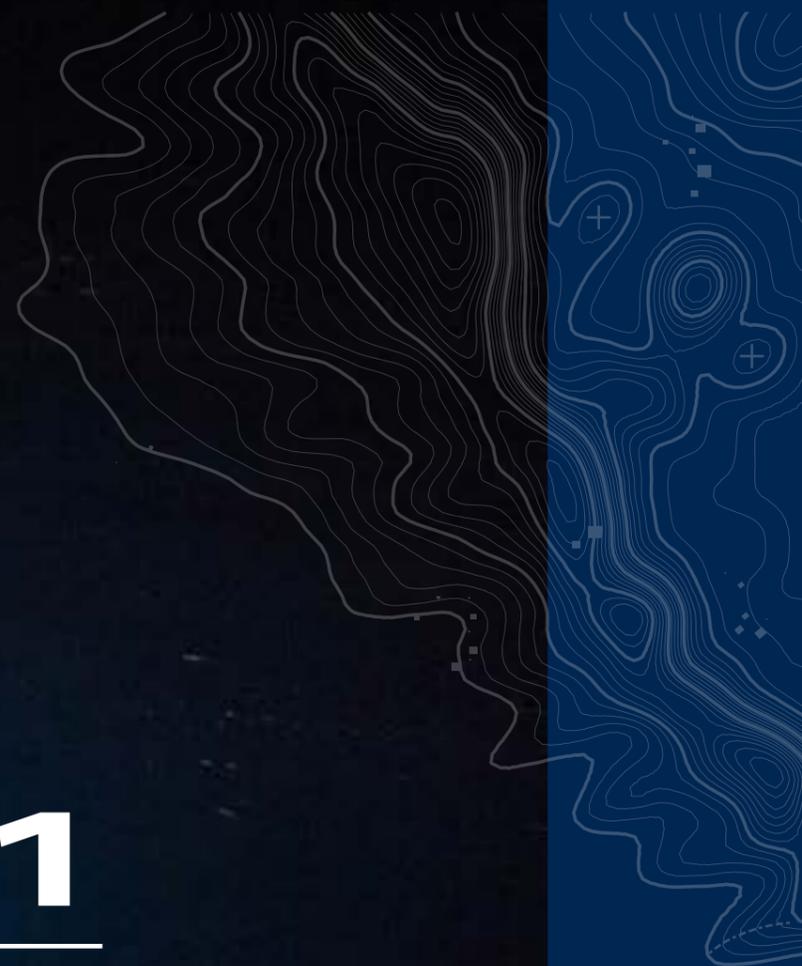
DEME Concessions has led the way in developing the Energy Island concept, which involves a multifunctional island which also has a pumped hydro storage function. In November, a partnership agreement was signed with Copenhagen Infrastructure Partners (CIP), a leading global fund manager specialising in renewable energy investments, to bid for the development of the Energy Island in the Danish North Sea, together with three other leading contractors. Set to become the world's first Energy Island, it will be located approximately 80-100 km off the Danish coast and will be able to connect 10 GW of offshore wind to Denmark and neighbouring countries, as well as having possibilities for large-scale energy storage and Power-to-X technologies. 🌱



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**GSR**



# GLOBAL SEA MINERAL RESOURCES

**Global Sea Mineral Resources (GSR), our deep-sea exploratory division, continues to take a step-by-step precautionary approach in pursuing its ambition to responsibly collect metal-rich nodules from the deep ocean floor. In 2021, our team of world-class engineers successfully tested GSR's pre-prototype nodule collector, Patania II, at a depth of 4,500 metres. The success of this ultra-deep-water trial, which was independently monitored by a consortium of EU scientists, helps pave the way to us delivering a much-needed source of high-grade, low carbon minerals.**

With Belgium as its sponsoring state, GSR was awarded a 15-year exploration contract by the International Seabed Authority (ISA) in 2013. Under this contract, GSR has exclusive rights to explore a 75,000 square km area of seabed within the Clarion Clipperton Zone (CCZ) of the Pacific Ocean.

On the ocean floor, almost five kilometres below the surface, lie billions of small rock-like accretions called polymetallic nodules. As their name suggests, they are multi-metal and contain critical metals such as nickel (~1.3%), cobalt (~0.2%), manganese (~28%) and copper (~1.1%). These nodules, which lie unattached, are not only high-grade; they are abundant. It is estimated that the CCZ, part of the abyssal plains and the size of Continental America, contains 1.8 times more nickel, 3.4 times more cobalt and 1.2 times more manganese than all known land-based reserves combined.



The sea trial was independently monitored by scientists aboard the vessel deployed by GSR.

Driven by the urgent need to build a decarbonised energy system and a growing and rapidly urbanising global population, demand for these metals is rising dramatically. The most recent analysis from the International Energy Agency (IEA) suggests that to reach the goals of the Paris Agreement, cobalt supply will need to grow 21-fold and nickel 19-fold by 2040.

Nickel, cobalt, manganese and copper never appear all together in single terrestrial deposits; usually three separate mines are needed. Additionally, ore quality is falling on land and terrestrial miners are having to explore for minerals in increasingly remote locations. Extracting metal from lower-grade and/or remote ores requires more energy, and increases production costs, greenhouse gas emissions and waste volumes. The high-grade, multi-metal

nature of seafloor polymetallic nodules presents an opportunity to obtain minerals with a significantly lower carbon footprint and less waste. Indeed, researchers at Ghent University conducted a prospective life cycle assessment that compared environmental effects of polymetallic nodule collection with land-based harvesting for the same metals. They published their findings in November 2021 and concluded that collecting polymetallic nodules could result in a 38 per cent reduction in CO<sub>2</sub> emissions and a 72 per cent reduction in acidification. The full paper can be read here: [deme-gsr.com](https://deme-gsr.com).

## SUCCESSFUL ULTRA-DEEP-WATER ENGINEERING TRIAL

Marking a major engineering achievement, in May 2021 GSR successfully concluded a technology trial of the pre-prototype nodule collector vehicle, Patania II, at a depth of 4,500 metres.

Patania II was deployed in the GSR (Belgian) and BGR (German) contract areas of the CCZ. The vehicle successfully demonstrated its ability to drive and manoeuvre on the deep seabed and collect nodules.

Responsibility, integrity and transparency are at the heart of the operations. GSR is taking a step-by-step approach to project development and is the leader in technology development. Our pioneering technology and iterative approach to development enables us to monitor, learn from, and reduce the environmental impact of our activities.



Learnings from the trials will be taken into the design of a commercial-scale nodule collector.

### INDEPENDENT SCIENTIFIC OVERSIGHT

GSR is working closely with multiple scientific research institutions focused on establishing environmental baseline measurements and impact assessments to better understand the effect of nodule collection on the marine environment and to ensure decisions are based on the best science possible.

Environmental monitoring is a key component of GSR's development program, ensuring the effects of our activities are understood, can be accurately predicted and improved upon, and will lead to the development and implementation of appropriate environmental management strategies.

The 2021 sea trial was independently monitored by scientists aboard the vessel deployed by GSR and by MiningImpact2, a partnership between

29 institutions from nine European countries, plus the International Seabed Authority. Scientists from MiningImpact2 joined efforts with the German exploration contract holder, BGR (Federal Institute for Geosciences and Natural Resources) aboard a separate vessel to conduct their independent monitoring.

State-of-the-art equipment was used to monitor the environmental effects of the trial including two remotely operated vehicles (ROVs), two autonomous underwater vehicles (AUVs), several oceanographic moorings laden with specialised monitoring equipment, in situ oxygen sensors, incubation chambers and pumps as well as 50 intercalibrated hydroacoustic and optical sensors to measure sediment concentration in the water column.

GSR also collaborates with the Massachusetts Institute of Technology's (MIT) Environmental Dynamics Laboratory to study sediment plume behaviour, which enables us to apply sophisticated mathematical modelling to predict and mitigate environmental impacts. Initial results from the trial are promising and suggest that most of the sediment is deposited within the vicinity of the collection area and stays close to the seafloor.

Learnings from this phase will be taken into the design and build of a commercial-scale seafloor nodule collector, which GSR expects to trial in a few years' time.

### PATENT APPLICATION FOR COLLECTOR HEAD

GSR applied for an international patent protection for the nodule collector head. The collector head is a critical component of the collection system that was successfully tested earlier in the year. It uses jet water pumps to lift nodules into a collection drum. The collector head is a precision engineered device that has been designed to collect nodules from the seabed while minimising disturbance of the surrounding sediment. ♻️



Polymetallic nodules contain critical minerals, such as nickel or cobalt.

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FLEET  
& EQUIPMENT



# FLEET & EQUIPMENT

## DREDGING FLEET AND EQUIPMENT

### 01 TRAILING SUCTION HOPPER DREDGERS

Congo River, DP/DT	30,190 m <sup>3</sup>
Pearl River, DP/DT	24,130 m <sup>3</sup>
Nile River, DP/DT	17,000 m <sup>3</sup>
Bonny River, DP2, DF	14,900 m <sup>3</sup>
Lange Wapper, DP/DT	13,700 m <sup>3</sup>
Uilenspiegel, DP/DT	13,692 m <sup>3</sup>
Breughel, DP/DT	11,796 m <sup>3</sup>
Brabo, DP/DT	11,650 m <sup>3</sup>
Breydel, DP/DT	11,296 m <sup>3</sup>
Antigoon	8,460 m <sup>3</sup>
Scheldt River, DP/DT, DF	8,373 m <sup>3</sup>
Meuse River, DP/DT, DF	8,290 m <sup>3</sup>
Marieke	5,580 m <sup>3</sup>
Artevelde	5,580 m <sup>3</sup>
Reynaert	5,580 m <sup>3</sup>
Pallierter	5,320 m <sup>3</sup>
Victor Horta	5,136 m <sup>3</sup>
Charlemagne	5,000 m <sup>3</sup>
Minerva, DF	3,500 m <sup>3</sup>
Mellina	3,309 m <sup>3</sup>
River Thames	2,500 m <sup>3</sup>

### 02 CUTTER SUCTION DREDGERS

Spartacus, DF	44,580 kW
D'Artagnan	28,200 kW
Ambiorix	28,170 kW
Al Jarraf	12,854 kW
Amazone	12,854 kW
Al Mahaar	11,224 kW
Rubens	10,896 kW
Ganga	6,035 kW
Cap Martin	5,541 kW
Vlaanderen XVI	1,786 kW
Seçkin	1,180 kW
Blanew	579 kW
Pixy	465 kW

### 03 BACKHOE DREDGERS

Samson	4,376 kW
Pinocchio	2,416 kW
Peter The Great	1,964 kW

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

<sup>1</sup> Delivery 2022/2023

<sup>2</sup> Co-ownership

### 04 SELF-PROPELLED SPLIT HOPPER BARGES

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

### 05 WATER INJECTION DREDGERS

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

### 06 DREDGING PLOUGHS

Aramis
Buckingham
Parakeet
Dhamra

### 06 SPREADER & MULTIPURPOSE PONTOONS

Al Dana, DP/DT
Bayard II, DP/DT
Naseem, DP/DT
1, DP/DT
Vagant, DP/DT
De Otter, DP/DT
Mattedoor, DP/DT

### 01 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>
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#### Barge unloading suction dredgers

Texel	2,076 kW
Vlieland	925 kW
Arlésienne	320 kW

### 03 Backhoe dredgers

Uburg	3-5 m <sup>3</sup>
VW9, VW47, VW55, Sambre, Sclessin	1.5-3 m <sup>3</sup>
Floreffe	0,5 - 1 m <sup>3</sup>

### 01



### 02



### 03



### 04



### 05



### 06



### 07



# FLEET & EQUIPMENT

## OFFSHORE FLEET AND EQUIPMENT

<b>08</b>	<b>FLOATING OFFSHORE INSTALLATION VESSEL</b>	
	Green Jade, DP3, DF <sup>1</sup>	38,000 t
	Crane	4,000 t
	Orion, DP3, DF	35,000 t
	Crane	5,000 t

<b>09</b>	<b>JACK-UP OFFSHORE INSTALLATION VESSELS</b>	
	Innovation, DP2	8,000 t
	Crane	1,500 t
	Sea Installer, DP2	7,400 t
	Crane	900 t
	Sea Challenger, DP2	7,400 t
	Crane	900 t
	Apollo, DP2	4,500 t
	Crane	800 t
	Neptune, DP2	1,600 t
	Crane	600 t

<b>10</b>	<b>FALLPIPE VESSELS</b>	
	Flintstone, DP2	17,500 t
	Seahorse, DP2 <sup>2</sup>	16,500 t
	Rollingstone, DP2	11,500 t

<b>11</b>	<b>CABLE INSTALLATION &amp; MULTIPURPOSE VESSEL</b>	
	Living Stone, DP3, DF	
	Cable Installation	10,000 t
	Rock Placement	12,000 t
	Viking Neptun <sup>1</sup>	
	DP3 Cable Installation	11,500 t

<b>12</b>	<b>HEAVY LIFTING EQUIPMENT</b>	
	Gulliver <sup>2</sup>	4,000 t
	Rambiz <sup>2</sup>	3,300 t

<b>13</b>	<b>OFFSHORE MAINTENANCE &amp; SERVICE VESSELS</b>	
	Groenewind	25 pax
	Aquata	12 pax
	Arista	12 pax

### OFFSHORE PONTOONS

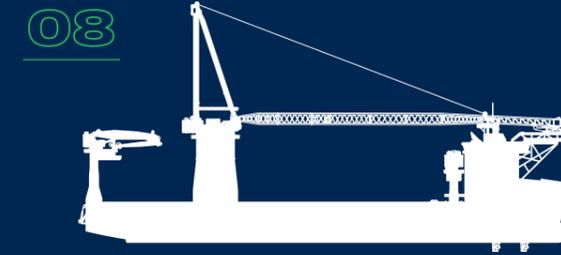
Bremen	10,000 t
Wismar	10,000 t
Stralsund	10,000 t

## ENVIRONMENTAL TECHNOLOGY

<b>14</b>	<b>FIXED RECYCLING CENTRES</b>
	GRC Kallo, Port of Antwerp (2) (BE)
	GRC Zolder, Albertkanaal (2) (BE)
	RC Antwerpen (BE)
	RC Charleroi (BE)
	RC Deinze (BE)
	RC Desteldonk (BE)
	RC Gent (BE)
	RC Liège (BE)
	RC Puurs (BE)
	RC Tubize (BE)
	RC Zeebrugge (BE)
	RC Den Helder (NL)
	RC Wambrechies (FR)

### MOBILE TREATMENT PLANTS

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



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

<sup>1</sup> Delivery 2022/2023

<sup>2</sup> Co-ownership

## **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.

DEME neither undertakes any obligation to update any forward-looking statements to reflect the actual results, nor does DEME assume any liability to correct inaccurate data, information, conclusions or opinions published by third parties in relation to this or any other report or press release issued by DEME.

Please note some pictures in the Activity Report were taken prior to COVID-19 restrictions and social distancing guidelines.

## **COMPILED AND COORDINATED BY DEME**

Internal & External Communication

## **GRAPHIC DESIGN**

[www.bbc.be](http://www.bbc.be)



## **PRINTING**

Grafilux printing



