Design. Build. Connect. Jan De Nul Group shapes water and land. Worldwide. From complex services to the offshore energy and energy transition sector, over large dredging and defence works on the edge of water and land, to challenging civil and environmental works. Well integrated competences and investments lead to creative, sustainable and innovative solutions. In this way, Jan De Nul Group meets the client’s wishes. Today, but also tomorrow.
MARINE WORKS
ULTRA-LOW EMISSION VESSELS

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Writing a preface for the annual report of 2019 amidst this corona crisis feels a bit uncomfortable. We know how we performed in 2019 and we know the plans that we had for 2020 and subsequent years. But these have, to say the least, been completely overruled by a virus that has the whole world in its grasp.

And yet, in spite of all this, we are confident about the future of our family business. The fifth De Nul generation, Jan Pieter and Dirk, is firmly in control. Also the sixth generation is fully involved in the company’s daily management and the future of the family business is already secured with a seventh generation. In 2019 the latter welcomed Jan Frans, a cousin for Clémence, Célestine and Cosette.

The market in 2019 was difficult and challenging. The rapid changes in the world, and at times the disruptive character of these changes, brought major challenges for every division of Jan De Nul Group.

Our dredging division is facing a diminishing share of free, open markets. On the one hand, the many small, local dredging companies are often favoured by local authorities. On the other hand, Chinese dredging companies show an ever increasing appetite for expansion.

The offshore division is executing pioneering projects in Taiwan with the construction of offshore wind farms in a location where both earthquakes and typhoons must be considered. This is not only a new challenge for us but also for our clients and suppliers. In 2019, we successfully built the first Taiwanese offshore wind farm through an EPCI contract.

The civil division and the environmental division had a pretty good year in 2019. The biggest challenge there is maintaining our order book at the same high level.

In 2019, Jan De Nul Group worked on 263 projects in 38 countries. A solid order book of 3.4 billion euro gave us a head start in 2020.

2019 will also be remembered as the year in which teenagers wanted to save their future. They showed the world that the climate and climate change have to be absolute priorities. Jan De Nul Group was already convinced of that. In 2019, we launched our first three ULEv hopper dredgers Afonso de Albuquerque, Diogo Caõ and Tristão da Cunha. In the coming years, more ultra-low emission vessels, which reduce CO₂ emission to an absolute minimum, will strengthen our fleet. One large and two medium-sized trailing suction hopper dredgers are currently under construction and will be delivered in 2020. The continuous expansion and modernisation of our fleet is done in a sustainable manner.
The fifth De Nul generation is firmly in control. And also the sixth generation is fully involved in the company’s daily management.

With the new generation of offshore installation vessels, the Voltaire and Les Alizés, we are more than ever ready to remain a leading player in the renewables industry. The design, financing and purchase of both vessels were a fine example of the unique cooperation between the various departments within Jan De Nul Group. Both vessels are currently under construction and will be deployed, in phases, during 2022.

Still, a company’s success is not only based on figures and equipment. The major difference is made by our employees: 6,875 colleagues working for the same goal. Therefore, ensuring their safety and providing adequate training are also key priorities.

With its internal ITA programme, Jan De Nul Group strengthens its corporate culture emphasising the crucial importance of both safety and quality. Not only the safety of its own personnel but the safety of every person involved; not only the quality of our own activities but also the quality delivered by our own suppliers. The JDN Academy encourages our employees to continuously learn from one another, and by offering them all opportunities to do so, through our internal training programmes.

With a solid order book and a good strategy, we at Jan De Nul Group believe in the future. Strengthened by the motivation of our employees, inspired by our rich history and driven by our ambition, we will safely navigate our large and agile ship through the economically difficult and uncertain times that the world is experiencing in 2020.
A growing world population – particularly in coastal areas – and rising prosperity, with an increasing demand for appropriate infrastructure and energy facilities, presents the challenge for tomorrow’s world.

Jan De Nul is able to meet this demand: from land reclamation to civil and marine construction works; seabed interventions for the fossil fuels sector and offshore wind farms for the renewable energy industry.

Jan De Nul not only improves global welfare by building infrastructure but also limits its own footprint with a unique combination of state-of-the-art innovative equipment and highly motivated, well-trained people. This powerful combination enables us to produce a satisfied customer on every project, not only in 2019, but also in 2020, and into the future.
6,875 colleagues in 2019

38 countries in which we were active in 2019

263 projects in 2019

224 PROJECTS IN EUROPE
30 Offshore services and dredging
134 Civil construction
47 Environmental remediation
13 Project development

14 PROJECTS IN ASIA
Offshore services and dredging

9 PROJECTS IN AFRICA
Offshore services and dredging

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263 projects in 2019

69 Offshore services and dredging
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13 Project development

PLEASE SEE WWW.JANDENUL.COM FOR ALL FINANCIAL RESULTS
Sustainability is an intrinsic part of Jan De Nul’s DNA. It is not just another tick in the box and is the driver behind all our activities. We are a pioneer in building offshore wind farms, we reduce the emissions of our fleet at a record pace, we develop innovative technologies to keep our environment clean and we offer solutions to the increasingly pressing scarcity of land. Our relentless innovation efforts enable us to remain a global pioneer in sustainability, in everything that we do, every day, again and again.
CROSS-DEPARTMENT COLLABORATION

One plus one can be much more than two. That’s why we at Jan De Nul firmly believe in sharing experience and expertise. We not only encourage communication and interaction between our different divisions, we also set up new business processes promoting cooperation between our many talented employees. We not only look beyond walls, we demolish walls and join forces.

CUSTOM-MADE SOLUTIONS

How do you renovate a tunnel that is used every day by 80,000 cars and, at the same time, avoid major traffic jams? How do you selectively remove plastic from a vulnerable nature reserve? How can you increase the competitiveness of a port without putting it to major expenses? We at Jan De Nul try to fathom the challenges of companies and governments that we work with. Their challenges become ours. We permanently develop new solutions for the issues of today, tomorrow and the day after tomorrow.
Sustainability is an intrinsic part of Jan De Nul’s DNA: we are a pioneer in building offshore wind farms, we reduce the emissions of our fleet at a record pace and we develop innovative technologies to keep our environment clean.
PIONEERING OFFSHORE WIND FARM WORKS IN TAIWAN

Offshore wind energy expansion is accelerating worldwide. Jan De Nul is now also exporting its know-how from Europe to Asia and is building three offshore wind farms off the Taiwan coast. “A pioneering project that attracts a lot of attention here”, says Virginie de Theux, who helps to keep the gigantic logistic operations on the Asian island on the right track.

In Europe, Jan De Nul has already built a solid track record when it comes to offshore wind farms: Bligh Bank Phase II off the coast of Zeebrugge, Alstom off the coast of Ostend, Karehamn in Sweden, Kriegers Flak in Denmark, Tahkoluoto in Finland, Global Tech One and Butendiek in Germany. All these projects have played an important part in the transition to 100 percent green and renewable energy. In the UK, Jan De Nul will install the turbines at the Dogger Bank Wind Farm, that when built, will be the largest offshore wind farm in the world. Dogger Bank will supply energy to 4.5 million households, around 5 percent of the UK’s total energy demand.
HAT-TRICK IN TAIWAN

After Europe, it’s now Asia’s turn. Jan De Nul scores a hat-trick: the company recently won three large offshore wind farm contracts in Taiwan.

Formosa 1 is the first commercial-scale offshore wind farm in Taiwan. The wind farm with an overall capacity of 128 MW is already up and running, with 22 wind turbines operating at full capacity. Jan De Nul delivered and installed the monopiles, transition pieces and cables.

More to the south in Changhua, we are currently building the Taiwan Power Company Offshore Windfarm Phase 1 Project - Demonstration, with a capacity of 109 MW. In a joint venture with Hitachi, Jan De Nul is the main contractor for this project and is responsible for the overall design, construction and installation of the wind farm. This project also includes the installation of the onshore cable and the renovation of an existing power distribution plant of the Taiwan Power Company, plus Jan De Nul and Hitachi will provide five years operation and maintenance for the offshore wind farm. The jacket foundations, cables and wind turbines have all been manufactured, with installation planned between May and September 2020.

Jan De Nul has also started building the offshore wind farm Formosa 2, which will have a capacity of 376 MW, triple the capacity of Formosa 1. The 47 wind turbines will supply green energy to 380,000 homes. Jan De Nul is responsible for the design, construction and installation of the jacket foundations – a technical masterpiece in water depths up to 55 metres – and for the design, delivery and installation of all subsea cables. Formosa 2 is planning to be operational in 2021.

Willem de Vlamingh installed all offshore cables for the wind farm project Formosa 1 and will do the same for Formosa 2.
Virginie de Theux is responsible in Taiwan for the logistics for the wind farms under construction.

"Both the ships and the components for the wind farms come from all over the world. Our team makes sure that the components and equipment all arrive at the site on time, both in the port and offshore. I also keep a close eye on the planning to make sure we have sufficient manpower to bring this entire operation to a successful conclusion. All these people work the whole day long and thus have a major appetite, so catering is another important part of my job."

"It is a tough job. The procedures imposed by the authorities require a lot of attention and planning and the communication is mostly in Chinese. But it is also a great job. Watching these gigantic turbines being erected at sea really appeals to one's imagination. Besides, I can help to build the future here. We help to fight back against climate change."

“Here, I can help to build the future and fight back against climate change.”

Virginie de Theux, Project Engineer
The offshore wind farms in Taiwan are truly pioneering projects in Asia. Does this attract much local attention?

"Definitely. Climate change is high on the global agenda. The wind farms off the coast of Taiwan are followed up very closely. Taiwan has an ambitious plan to transition to green energy production in four years’ time and to increase its energy independence. Wind energy is playing a crucial part in these ambitions. Besides, many other countries within the region have similar plans. Japan, for instance, is working on floating offshore wind farms. And developers also follow the projects with great interest. Ecology goes hand in hand with the economy. In Asia, a whole new market may open up to us. The offshore wind farms in Taiwan will give a major boost to wind energy.”

What are the biggest challenges for the construction of offshore wind farms in Taiwan?

"Jan De Nul has a lot of experience with offshore wind farms. But you can’t just copy-paste your approach. In every project, the specific circumstances differ a great deal. Our offshore projects can be completed in a couple of months, this is hugely intensive and amazingly fast. But the preparatory phase takes a lot more time.”

“In Taiwan, we’re facing some highly specific circumstances. To begin with, of course, Taiwan is an island. This already represents a major challenge from a logistic point of view. We work in tremendously deep waters, with water depths up to 55 metres. Furthermore, we have to consider potential typhoons and earthquakes. We work at sea, between 4 and 9 kilometres off the coast, and have emergency plans to immediately bring all our people to safety. The foundations are designed to withstand worst case scenarios. The wind farms are designed and built so that they can withstand even the most severe earthquake. Our engineers are really performing miracles here.”

Which role does Jan De Nul play in the steady progress of offshore wind energy?

"The wind farms that we’ve built in Europe are important references. Only a few companies have the technical know-how and can handle such an enormous logistic operation.”

In your opinion, how will the world of offshore wind energy evolve in the coming years?

"I think that we’re now witnessing the beginning of a huge boom. The transition to green, renewable energy gathers pace, but there is still a lot of progress to be made. In Europe, offshore wind farms are well established, elsewhere in the world more countries and companies will follow suit. When you consider that the largest wind farm in Taiwan will supply energy to 380,000 homes, you know that wind energy will have a huge impact on the production of energy and on climate change. This transformation is gaining momentum and cannot be stopped anymore.”

Virginie de Theux, Project Engineer

Jan De Nul is responsible for the entire design, manufacture and installation of the Taiwan Power Company Offshore Windfarm Phase I Project - Demonstration.
The Afonso de Albuquerque had the honour to be the first operational ULEv ever.
A NEW GENERATION OF ULTRA-LOW EMISSION VESSELS

With the Afonso de Albuquerque, Jan De Nul deploys the very first so-called ULEv dredger. ULEv stands for Ultra-Low Emission vessel. The innovative, sustainable vessel that received its baptism of fire in Quequén, Argentina, heads a whole new generation of low-emission vessels.

“This trailing suction hopper dredger is the first of a whole generation of environmentally friendly dredging vessels”, explains Marcelo Persichini, who as Project Engineer coordinates the maintenance dredging works in the ports of Quequén and Bahía Blanca.

The Afonso de Albuquerque was used for deepening the access channel and swing basin of the port. The ship will also be used for the multi-annual maintenance dredging works in this port and for other maintenance dredging works in Argentina.

“An ingenious system filters the exhaust gases before they are emitted. The filter eliminates the toxic substances and reduces the harmful emission to an absolute minimum. The diesel particulate filter extracts up to 99 percent of all particulate matter and soot particles from the exhaust gases.”

Our Ultra-Low Emission vessels can be recognised by their blue funnels.
“OUR ULEv VESSELS HAVE BOOSTED OUR REPUTATION AS INNOVATIVE PIONEER.”

Marcelo Persichini, Project Engineer

SCOOP WITHIN THE SHIPPING INDUSTRY

Jan De Nul got the inspiration for its ULEVs in Switzerland. The Swiss tunnel industry played a pioneering role in filtering exhaust gases. To ensure that workers who are working in long tunnels breathe in clean air, the vehicles and machines are all equipped with an exhaust gas filter system. Jan De Nul succeeded in translating this technology to the shipping industry and in developing the innovative, pioneering ULEv solution internally.

The baptism of fire of the Afonso de Albuquerque, a trailing suction hopper dredger with a dredging capacity of 3,500 cubic metres, was a major success according to Marcelo Persichini. “Also in Argentina, climate change is a hot topic. The port of Quequén is right next to one of the most popular beaches, so there was a great deal of interest in our first ULEv. We are very proud that we were the first to introduce this technology. Jan De Nul has a long track record in Argentina and our ULEv vessel further strengthened our reputation as an innovative pioneer.”

Jan De Nul is responsible for deepening the access channel and swing basin of the port of Quequén.
OUTPERFORMING EVEN THE STRICTEST STANDARDS

The Afonso de Albuquerque soon had company. Jan De Nul already expanded its fleet with seven ULEvs. All our new next generation vessels are low-emission vessels.

Jan De Nul is the first dredging company in the world to launch dredging vessels that meet the most stringent European emission standards, such as the Stage V standards. These European Stage V emission standards for inland navigation vessels go a great deal further than the standards of the International Maritime Organisation. Because dredging vessels are mainly active in estuaries, close to the coast or in ports – often close to highly populated areas – Jan De Nul is committed to maximising the reduction of harmful emissions. We want to go beyond what is imposed by the shipping authorities. Far beyond.

Quequén:
To be able to open the port to ships with a draught of more than 14 metres, the harbour basin and the canal in the inner and outer harbour must be deepened to obtain a depth of about 15 metres.

Bahía Blanca:
This port is known for its export of corn, oil and fertilisers. It is one of the most important ports in Argentina as it is the only one with a natural depth of 12.80 metres. Dredging campaigns ensure that the depth of the main canal is maintained at 15.10 metres.

OUTPERFORMING EVEN THE STRICTEST STANDARDS.
BELGIUM’S MOST SUSTAINABLE CONSTRUCTION SITE

Maintenance dredging works in the marinas of Nieuwpoort have set new sustainability standards. Jan De Nul fuels its dredging vessels with renewable biofuel and reduces the energy consumption in the site offices by 80 percent. This has lowered the CO₂ emission of the dredging works by 15 percent, which is a first in Belgium.

In 2006, Jan De Nul started the maintenance dredging works in the harbour channel and marinas of Nieuwpoort. Under the name ‘Act Green’, Jan De Nul has committed itself to reduce the CO₂ emission during these dredging works by 15 percent every year. As such, Jan De Nul is the first dredging company to include a climate ambition in writing, within a commercial contract.

VESSELS SAIL ON RENEWABLE BIOFUEL

The two split hopper barges that carry out maintenance dredging works, the Magellano and the Verrazzano, sail on drop-in biofuel: a high-grade fuel originating from certified and sustainable waste flows. As such, the vessels not only emit less CO₂ but also a lot less particulate matter.

In addition to the Magellano and the Verrazzano, Jan De Nul has, with the Alexander von Humboldt, a third ship in the Benelux sailing on sustainable fuel.

Jan De Nul has already been executing maintenance dredging works in Nieuwpoort since 2006.
First dredging company to include a climate ambition in writing, within a commercial contract.

ECOLOGICAL SITE OFFICE

Within the scope of the Act Green programme, Jan De Nul Group is turning the marina of Nieuwpoort into Belgium’s most sustainable construction site. The state-of-the-art, energy-efficient construction site shed will consume about 80 percent less energy than your average site office. Extra insulation (on roof, walls and floor), triple glass windows and door pumps keep the cold out and the heat in. Solar panels on the roof provide energy, with a heat pump to ensure heating and cooling. In the offices, you won’t find conventional lamps but modern, energy-efficient LED lighting.

PIOeneERING ROLE

With this project, Jan De Nul wants to claim its role as an absolute pioneer in the development of a sector-wide programme for reducing the CO₂ emission. By 2022, the Belgian government wants to include a commitment to realise a CO₂ reduction of minimum 15 percent across eighty percent of the maintenance dredging contracts in Flanders.

BEACH CLEAN-UPS

Each year, over ten million tonnes of plastic end up in our oceans. By organising beach clean-ups across the world, Jan De Nul contributes to the fight against plastic pollution.

From 440 kilograms near our site in Ghana up to a formidable 4.5 tonnes on the beach where we are currently working in Benin. In cooperation with local residents, our employees have already collected an impressive amount of waste during beach clean-ups. And yet, the need remains high. That’s why the sustainability action plan of Jan De Nul is very ambitious. The protection of oceans, seas and rivers is an absolute top priority for us. By keeping our natural working area clean and free from plastic litter, we help fulfil our social responsibility.
Flanders is struggling with many underutilised, and often contaminated sites. Envisan, the environmental division of Jan De Nul, remediates contaminated sites and Jan De Nul subsidiary PSR, Partner in Site Reconversion, gives these sites a new life.

In Mechelen, we’ve started with the reconversion of the Inofer site. Up to 2013, this site contained a press shop for non-ferrous metals and before that, a malt-house and a rubber factory. The site is not only contaminated, it also has the Socaré building that is heritage protected, and other buildings that have to be demolished. Clearly no lack of challenges for PSR here.

A couple of miles along the road, in Rijmenam, by the Dijle river, the iconic furniture factory Meurop has remained empty since it went bankrupt in 1980. PSR will give both these sites a new, mixed life.
These are two examples from fifteen redevelopment projects – covering a total surface of about 75 acres – that PSR is executing in Flanders. In the pipeline, there are a dozen other contaminated sites for redevelopment. From purchasing and remediating the site to its reallocation and redevelopment, PSR takes on the whole project scope. Envisan, the environmental division of Jan De Nul Group, plays a key role in the soil remediation with Jan De Nul as the primary contractor.

The redevelopment of brownfield sites is crucial for safeguarding the scarce open space. The need to start using greenfield sites reduces the more underutilised sites are being redeveloped.

Inofer: The former industrial site is being redeveloped into a residential area with offices.

Envisan applies the most sustainable techniques with the lowest possible CO₂ emission and impact on the environment. During earth-moving works in redevelopment projects, this earth is re-used to the maximum extent possible on the site itself. The remediation of the Inofer site entails a combination of excavating contaminated soil and removing it to one of our valorisation centres (for a/o biological and physicochemical treatment) and an in-situ groundwater remediation programme based on recirculation, an innovative technique developed within Envisan.
At Jan De Nul we firmly believe in sharing experience and expertise: we not only encourage communication and interaction between our different divisions, we also set up new business processes promoting cooperation between our many talented employees.
OFFSHORE WIND FARM NORTHWESTER 2 - FROM DESIGN TO INSTALLATION

The wind farm Northwester 2, off the coast of Ostend, will have the world’s most powerful wind turbines. Jan De Nul will build the entire wind farm: from its design to the transportation of the foundations and the installation of the cables and huge wind turbines.

Northwester 2, the seventh wind farm off the Belgian coast, will operate at full capacity this year. The 23 turbines have an overall capacity of 219 MW and can deliver electricity to 220,000 homes. The offshore wind farm therefore pays a major contribution to Belgium’s climate ambitions.

Project developer Parkwind contracted Jan De Nul for building the offshore wind farm with a so-called EPCI-contract (Engineering, Procurement, Construction, Installation), which assigns the construction of the wind farm from start to finish to the Principal. The design, transport and installation of the foundations have been assigned to Jan De Nul. But also the installation of the cables and the turbines.

To bring the Northwester 2 project to a successful conclusion, several Jan De Nul departments joined forces. Not only because it is such a large-scale project covering both the engineering and installation phase, but also because the offshore wind farm brings together a number of different disciplines. In the procurement phase, departments such as Legal and Insurance play an important part. As also...
Jan De Nul installs the most powerful wind turbines currently operational.

The budgets in the EPCI contract are entirely on account of Jan De Nul, the financial department is also an extremely important partner throughout the whole project track. In other words, the entire company was involved in the realisation of the Northwestern 2 project.

The offshore wind farm marks a number of milestones. It is the first commercial wind farm using the V164-9.5 MW turbines. These are the most powerful wind turbines currently operational. Worldwide. No other installed turbine has a larger capacity today. A real technical masterpiece. The transport and installation of such powerful turbines also present additional challenges. Especially for this project, the offshore installation vessel Vol au Vent was equipped with a brand new monopile gripper. A new gripper that aids the installation of 23 of these giants in water up to 40 metres deep in the North Sea.
Northwester 2 is the seventh project in the Belgian North Sea and the fourth Parkwind project.

Turbines
- Foundation: Monopile
- Rotor diameter: 164 m

Location
- Depth: 25 to 40 m
- Distance from shore: 51 km
- Area: 12 km²
- Total capacity: 219 MW
- Number of turbines: 23
- Capacity/turbine: 9.5 MW
- Wind turbine type: Vestas 164
- Operational: 2020
Imagine the risk. Think of a plan. Act and execute the plan. Throughout the different divisions of Jan De Nul, the ITA programme sets up process to increase efficiency and avoid incidents. The cross-division leadership visits fit perfectly into this programme: two colleagues from two different divisions following one another for a whole day on their respective territory and picking up new and useful experiences.

What can a captain on a dredger and a project planner for tunnel works learn from one another? Today, Johan De Backer is working as cable pull supervisor in Taiwan, where Jan De Nul is building offshore wind farms. Previously, he was the captain of the dredger Hondius. Sam Van Cauter monitors the quality of the works in the Leopold II tunnel in Brussels. Last summer, Johan and Sam followed one another for a day within their respective work environments.

What did you learn from this experience?

Johan: “When you do the same job for a long time, things may start becoming repetitive. You develop blind spots, risks that you no longer see or start underestimating. A fresh look on things can help. Can this be done more safely? Can it be done differently? It is from this perspective that we looked at each other’s activities.”

Sam: “Safety requires our permanent attention. But in the Leopold II tunnel, we work under major time pressure and face many variables, every single one of them entailing specific risks: many people, limited space, different contractors and several subcontractors. All with their own role and
It is always useful and instructive to exchange experiences between totally different worlds.

Sam Van Cauter, Work Planner

responsibility. Johan has already pointed at a couple of items that require our attention. For instance, we’ve fitted in extra railings in different places to reduce the risk of falling.”

**Johan:** “It was more than a courtesy call. We both benefited from each other’s tips and comments.”

**Did you take certain lessons back to your own work area as well?**

**Sam:** “For sure. I noticed that the crew on a dredger pays a lot of attention to prevention and preparation. For instance, they always have containers ready for being immediately able to counter an oil or other leak. We also work with heavy machines. So, these oil spill containers may also be a good way to anticipate this risk on our domestic construction sites.”

**Johan:** “Of course, a ship is something completely different than a tunnel. I’m at sea, Sam is underground. You can’t just copy-paste your approach. But it is always good to come out of your comfort zone once in a while. It keeps you alert.”

**Is such cross-division leadership visit worth repeating for you both?**

**Johan:** “Jan De Nul has grown enormously in recent years. The company is active in various domains, in an increasing number of countries across the world. It is fascinating to look over the fence now and then and see what your colleagues are doing.”

**Sam:** “It is always useful to exchange experiences. Even if it concerns two very different worlds, we’ve both noticed that we can still learn from one another. I wouldn’t mind paying you another visit, Johan, to check what you are doing there in Taiwan.”
JOINING FORCES TO BUILD THE WORLD’S LARGEST INSTALLATION VESSELS

Global concern for the imminent climate change has given wind energy an enormous boost. The demand for offshore wind farms is increasing exponentially.

Philippe Hutse | Offshore Director: “It is not only the increasing demand that poses major challenges for us. The newest generation of wind turbines is also becoming ever bigger, up to 270 metres high and with blades of 120 metres long. As a result, the foundations...”

To boldly go where no man has gone before. That is exactly what Jan De Nul does with the Voltaire and Les Alizés, the world’s largest and most powerful installation vessels of their kind (one on legs, one floating) that will build the next generation of offshore wind farms. Offshore Renewables, Newbuilding, Finance: various Jan De Nul departments have joined forces to bring this mega-project to a successful conclusion. From its earliest concept up to the vessels’ launch.
must become increasingly massive. The offshore installation vessels currently available on the market are facing ever more difficulties to install this new generation of wind farm components.

Koen Marchand | Operations Manager Renewables Department: “We’ve conducted in-depth analyses of our market and our competitors. Offshore wind farms are prepared well in advance, you should easily count on a five-year term before a farm can be actually built. The trend to build ever bigger and heavier turbines, blades and foundations, will continue in the future. A couple of years ago, we installed turbines with a capacity of 4 MW, and soon we will now install 12 MW turbines. Developers are already aiming at 15 MW or 20 MW turbines, with accompanying components. This trend will not go on forever, but for now we haven’t yet seen the end of this evolution.”

Philippe: “At Jan De Nul, we are perfectly aware of what we can and cannot do. If we want to continue playing a leading role on the offshore energy market, and within the offshore wind segment in particular, our current fleet is no longer adequate. We need bigger and more powerful installation vessels for this next generation. That was the trigger for developing our new vessels, the Voltaire and Les Alizés.”

Philippe Hutse, Offshore Director

“If we want to continue playing a leading role on the offshore energy market, we need bigger and more powerful installation vessels. That was the trigger for developing our new vessels, the Voltaire and Les Alizés.”

From left to right: Robby de Backer, Aderic Nuytinck, Philippe Hutse, Koen Marchand
FUTURE-PROOF, FROM CRANE TO CABIN

Robby de Backer | Newbuilding Director: “What are the criteria that a newly built vessel must meet to anticipate future needs? We took this question to our Newbuilding department. We translate the set of requirements into concrete specifications: deck size, the working depth of the ship, capacity, minimal emission values even more important for offshore renewables than elsewhere, etc. From fundamental decisions – how many thousand tonnes must the crane be able to lift? – to where in his cabin can the captain leave his toothbrush. We then enter all these specifications into a first preliminary design. Designing such a ship is a very interactive process: designs go back and forth between the various departments involved all the time.”

Philippe: “We then take these designs to the market again. We check which tenders are in the pipeline, consult with clients, assess whether or not there is sufficient demand. This is crucial, of course. For the Voltaire, the first agreement has already been signed. The installation vessels are, in first instance, designed to install offshore wind farms but of course they can also execute other offshore projects, think of the installation of offshore substations and the decommissioning of existing offshore structures or retired offshore wind farms.”

Robby: “Every project is different. What it comes down to for every specific mission is making the interface between ship and equipment as cost-effective and future-proof as possible. We cannot entirely rebuild our installation vessels for every new offshore wind farm. The gigantic range of equipment that is typical of an installation vessel must be quickly adaptable to a wide range of projects.”

GREEN LOAN FOR HUGE INVESTMENT

Aderic Nuytinck | Financial Manager: “Obviously, financing is a crucial part of this mega-project. Investments of this magnitude require a comprehensive financial analysis that
The Alizés

- Floating installation vessel (can also install foundations in deeper waters and into more challenging sea beds)
- Main crane of 5,000 tonnes
- Deck loading capacity of 61,000 tonnes
- Also suited for dismantling platforms at sea

takes into account the company’s overall investment programme as well as the current and expected market conditions. We did not rush into things. We’ve done our homework thoroughly.”

Aderic: “Two brand new offshore installation vessels that will play a leading role in achieving global energy transition objectives. This investment perfectly fits the bill for a green loan. To strengthen our climate change ambitions even more, we concluded a green loan of 300 million euro with a consortium of five banks. This green loan is subject to very strict conditions. Both during the construction of the installation vessels and after their delivery, we must report – together with an independent external expert – on the technical specifications and activities of both vessels. This means that as the company’s financial department we already needed quite a lot of information about the technical features and operations of the vessels when we were setting up the financing for them. This close cooperation with the departments za and Offshore Renewables will be continued in the years ahead.”

OPERATIONAL IN 2022

Robby: “The construction of the Voltaire and Les Alizés will take about three years. The engineering phase is entering the home straight, with the construction works at the shipyards in China starting before the summer of 2020 and be completed in 2022. But even during the construction of the vessels, we will closely monitor the market evolutions. If new needs emerge, we can still make adjustments. The story has had an excellent start, and for Jan De Nul the Voltaire and Les Alizés will be a never ending story.”
We at Jan De Nul try to fathom the challenges of companies and governments that we work with. Their challenges become ours. We permanently develop new solutions for the issues of today, tomorrow and the day after tomorrow.
HOW DO YOU RENOVATE THE LONGEST TUNNEL IN BRUSSELS WITHOUT CAUSING HUGE TRAFFIC JAMS?

CAUTION: PEOPLE ARE WORKING HERE AT NIGHT

The Leopold II tunnel is the longest and one of the most complex traffic tunnels in Brussels and is in urgent need of a thorough renovation.

Jan De Nul is one of the contractors that will execute this challenging mega-project. What makes these works unique, is the fact that they will be executed at night only. During the day, about 80,000 vehicles make use of the tunnel connecting – over a distance of 2.6 kilometres – the Koekelberg Basilica with the inner ring road. But the tunnel is in poor condition and visibly ageing. Water is seeping in, the concrete is crumbling and also the roof structure, walls, paving, waterproofness system and electromechanical equipment are in need of a thorough renovation. In addition, all existing emergency exits will be adapted and 17 new ones will be built to meet the (more stringent) European safety regulations that came into force after the accident in the Mont Blanc tunnel.

The Consortium CIRCUL, in which Jan De Nul, Besix and Engie-Fabricom joined forces, came out on top of a European tender process. It will not only renovate the Leopold II tunnel but will also be responsible for its maintenance over a 25-year period.
The unique execution of the renovation works requires a very efficient use of workers.

What makes these works unique, is the fact that they will be executed at night only. During the day, traffic can continue to take the tunnel.

DOUBLE CHALLENGE

It was a huge challenge for the contractors. The Brussels Capital Region (the client) not only ordered a thorough renovation of the Leopold II tunnel within a tight timeframe, the gigantic infrastructure works also had to be executed with as little impact on through traffic as possible.

Jan De Nul therefore concentrated the works at times during which traffic in the Leopold II tunnel is lowest. Only in the summer holidays, the tunnel will be closed to the public on a 24/7 basis. But during the other months of the year, the works in the tunnel will be executed at night only. Between 10 pm and 6 am, the Leopold II tunnel is closed, during the rest of the day, it is open to traffic like any other day.
TEST CASE FOR OTHER MAJOR INFRASTRUCTURE WORKS

This unique approach not only requires a very efficient use of workers. To be able to optimally use the limited working hours at night, Jan De Nul will deploy state-of-the-art equipment with back-up systems available for all crucial machinery.

The works on the Leopold II tunnel will last up to 2022 but the first evaluations have been extremely positive. Traffic disturbance has been limited, there have been no major traffic jams, and the transition between closing and re-opening the Leopold II tunnel has gone smoothly. This turns the renovation of the tunnel in Brussels into an interesting test case for other large and complex infrastructure projects.

SCHEDULED TUNNEL AND ABOVE-GROUND WORKS

- Removing asbestos and repairing the structure
- Restoring the waterproofness
- Installation of a new ventilation system
- Increasing the smoke extraction capacity
- Replacement of electromechanical systems (video surveillance, alarm systems, fire detection)
- Construction of new technical rooms to facilitate the interventions of emergency services
- Construction of 17 additional emergency exits
- Installation of new signposting and a real-time mobility management system
- Renewing of road surface and footpaths
- Creating a new decor and installation of LED lighting

Jan De Nul provides the Leopold II tunnel with no less than 17 extra emergency exits.
To remove millions of plastic particles from the vulnerable nature reserve Galgeschoor, the Port of Antwerp was looking for an innovative, ecologically sound and economically viable solution. This so-called Plastic Challenge was made to measure for Jan De Nul. Experts from our Environmental Division Envisan took the lead and engaged new Jan De Nul employees in the project. This unique cooperation led to the winning design: the Nul-O-Plastic. Tom Van Vooren, R&D Engineer at Envisan, was one of the driving forces behind the project. Valérie Lentacker, a fresh new recruiter from the Staff Department, was challenged to think along.

"Many companies have already asked us to use our Nul-O-Plastic."

Tom Van Vooren, R&D Engineer

How was Envisan involved in the Plastic Challenge?

Tom: “For such a challenging project, which by its specific conditions (working in a nature reserve) requires an innovative approach, Envisan is the right place to be. Our R&D department could sink its teeth in the project and examined several possible ways to come up with the best possible solution to tackle the plastic pollution. At the same time, we thought it was a lovely challenge to involve some new Jan De Nul employees in the project. The Plastic Challenge lent itself to innovative, creative ideas and the very topic of the challenge appeals to everyone today. Together with the Knowledge, Processes and Innovation department, we’ve turned the Plastic Challenge into a Jan De Nul Challenge.”

In the end, the ‘Nul-O-Plastic’ won first prize. What exactly does this machine do?

Tom: “Although it would be a bit disrespectful, you could compare our Nul-O-Pastic with a large vacuum cleaner. It is a vacuum unit extracting plastic particles from the nature reserve. The biggest challenge was finding a solution that is tailored to the Galgeschoor but, at the same time, can be deployed in other places facing similar problems. Being a particularly sensitive nature reserve, a condition was that any solution should not damage the Galgeschoor in any way. Yet, at the same time, the solution had to be sufficiently big and powerful to be able to remove the plastic within a realistic time span.”

When will the Nul-O-Plastic be operational? Was it a once-only project for Jan De Nul?

Tom: “The Nul-O-Plastic will most definitely start working in 2020 and I am quite sure that numerous other projects will follow. Many companies have already asked us to deploy the vacuum unit, we call it the Nul-O-Plastic 001. We notice that the plastic pollution issue is gaining more importance everywhere. Once we will have successfully cleaned up the nature reserve Galgeschoor, the question will not so much be if, but rather where and when the Nul-O-Plastic will be deployed. As such, a project like this fits in perfectly with Envisan’s mission: ‘Circular solutions for a better planet’. Within Jan De Nul, we at Envisan are increasingly working together with other departments to jointly tackle ecological challenges. Sustainability really is a major driver behind all our activities.”
What was your role in the Plastic Challenge?

Valérie: “Before spreading out across the world, people starting at Jan De Nul first follow a training programme for a couple of weeks at the Jan De Nul Academy, in Aalst. Within the scope of the Academy training, we starters were challenged to find solutions for removing plastic from the Galgeschoor. The composition of the groups was particularly diverse. I have an economic degree, other team members were engineers or land surveyors. This cross-fertilisation made it incredibly fascinating. We all considered the problem from a different perspective, and we pulled each other out of our respective comfort zones.”

Which solutions did your team come up with?

Valérie: “We suggested several solutions, ranging from a kind of vacuum cleaner to bacteria that would degrade the plastic in a natural process. We were encouraged to tackle the problem with an open mind. We didn’t have to be too concerned about the technical execution because Jan De Nul has plenty of people with the necessary experience and expertise to convert these ideas into feasible solutions. It was our role to challenge them with candid ideas.”

What did the Plastic Challenge teach you about Jan De Nul?

Valérie: “It was immediately clear to everyone how important sustainability is for Jan De Nul. It’s not just a paper statement, it’s in the company’s DNA. Sustainability really is a reflex, second nature so to speak.”

The Plastic Challenge was your first introduction into the corporate culture of Jan De Nul. How was this for you?

Valérie: “Great. It tells a lot about Jan De Nul that we were immediately involved in the company’s operations and that we could contribute to finding a solution to a very concrete problem. Jan De Nul is a huge international company but it’s also still a family business. The communication lines are short, open and transparent. As a new starter, your opinion and your ideas count. There is room for original perspectives. Even though I am only working at Jan De Nul for half a year now, good proposals are followed up immediately.”
The port of Guayaquil in Ecuador is a unique project for Jan De Nul. In addition to the capital and maintenance dredging works in the 95-km access channel, we are also installing a state-of-the-art Vessel Traffic Service, a kind of traffic management system for shipping. The project is entirely financed by Jan De Nul, the investment will be earned back by the toll that ships will pay for using the access channel.

“DREDGING IN GUAYAQUIL IMPOSSIBLE? THEN THEY DON’T YET KNOW JAN DE NUL.”

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Project Manager Dominic De Prins must keep this ambitious project in Ecuador on the right track. Also for him, this is a first. “In most Jan De Nul projects, we work with our own people, people whom we know, expats who temporarily move to other countries for executing large-scale projects. Once the works have been completed, these people move to another project in another part of the world. In Guayaquil, we have a 25-year concession for maintenance dredging in the port and access channel. This requires another vision and approach. Meanwhile, we are working with an extensive and increasing group of local people, whom we must guide through the Jan De Nul values and standards. We’re here to stay.”

HARD ROCKS ON THE SEA BED AND SWELL AT SEA

“Los Goles, that is the name given in Ecuador to the section of the access channel consisting of rocks that would be ‘impossible to dredge’, explains Dominic De Prins. But then they don’t yet know Jan De Nul. Still, we had to consider that the rocks on the seabed would not be our only challenge. The timing was very tight as well. You can work here for a couple of months only. In the remaining part of the year, the swell makes this impossible. It was an extremely tough job, a race against the clock. We really set to work at a record pace and, using one of our largest cutter dredgers, succeeded in realising this first milestone.”

“The second section of the access channel poses yet another challenge to Jan De Nul. Here, the seabed is soft but very dynamic because of sedimentation and other processes. Not the dredging works by themselves are the problem here but constantly and efficiently maintaining the correct depth of the channel.”

STATE-OF-THE-ART TRAFFIC MANAGEMENT SYSTEM FOR SHIPPING

Jan De Nul not only makes the port of Guayaquil accessible to larger vessels but also ensures that the maritime traffic can be properly managed. “We equip the port authority with a high-tech Vessel Traffic Service (VTS) system, a kind of traffic management system for shipping.”

“This VTS system is above all meant to improve the safety of maritime traffic: the traffic manager can see when vessels will cross one another and can
indicate the right of way from a remote position. But, obviously, it also offers considerable added value from an economic point of view. Thanks to a safe and efficient traffic management, more vessels will be able to enter the port of Guayaquil.

**TOLL COLLECTION TO RECOVER DREDGING WORKS INVESTMENT**

Jan De Nul has financed all the infrastructure works itself, both the dredging works and the installation of the VTS system. In turn, we will collect a toll for this investment. Every ship entering the port of Guayaquil will pay a pre-set toll based on the volume of the ship. "We apply a very transparent toll collection system: ships pay per gross registered tonnage. They only pay for sailing into the port and thus immediately receive a return ticket. Whether they stay in the port for only one day or for ten days on end, the amount of toll remains the same."

**ENGAGING LOCAL STAKEHOLDERS**

If Jan De Nul wants to earn back its investment in Guayaquil, it will need many ships to visit the port. "Our revenues depend to a large extent on how Guayaquil is doing", explains Dominic. "You can compare it with the péage on highways. If car drivers can drive faster on secondary roads and quality is better there, they will avoid toll roads. The same applies to maritime traffic. Ships only pay a toll when receiving efficiency, perfect infrastructure and an impeccable service in return."

"A considerable part of my job therefore consists of building and maintaining good long-term relationships with local stakeholders. We share the same interests, we should all pull in the same direction. If the port of Guayaquil performs well, this will be good for Jan De Nul, the local economy and the local community."

"This was also an important argument to get the shrimp farmers on board. Alongside the access channel of the port of Guayaquil, there are dozens, if not hundreds of these farmers. They were afraid that the dredging works would have a negative impact on the water quality and that they would have to refresh their water more often. We were able to reassure them by presenting our working methods, tests and measurements, and we also included them in the growth story behind this project. When the port of Guayaquil will be able to receive larger vessels, they will be able to reduce their export costs. Everyone must have something to gain from it."
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Ce rapport est également disponible en français.
Este informe también está disponible en español.