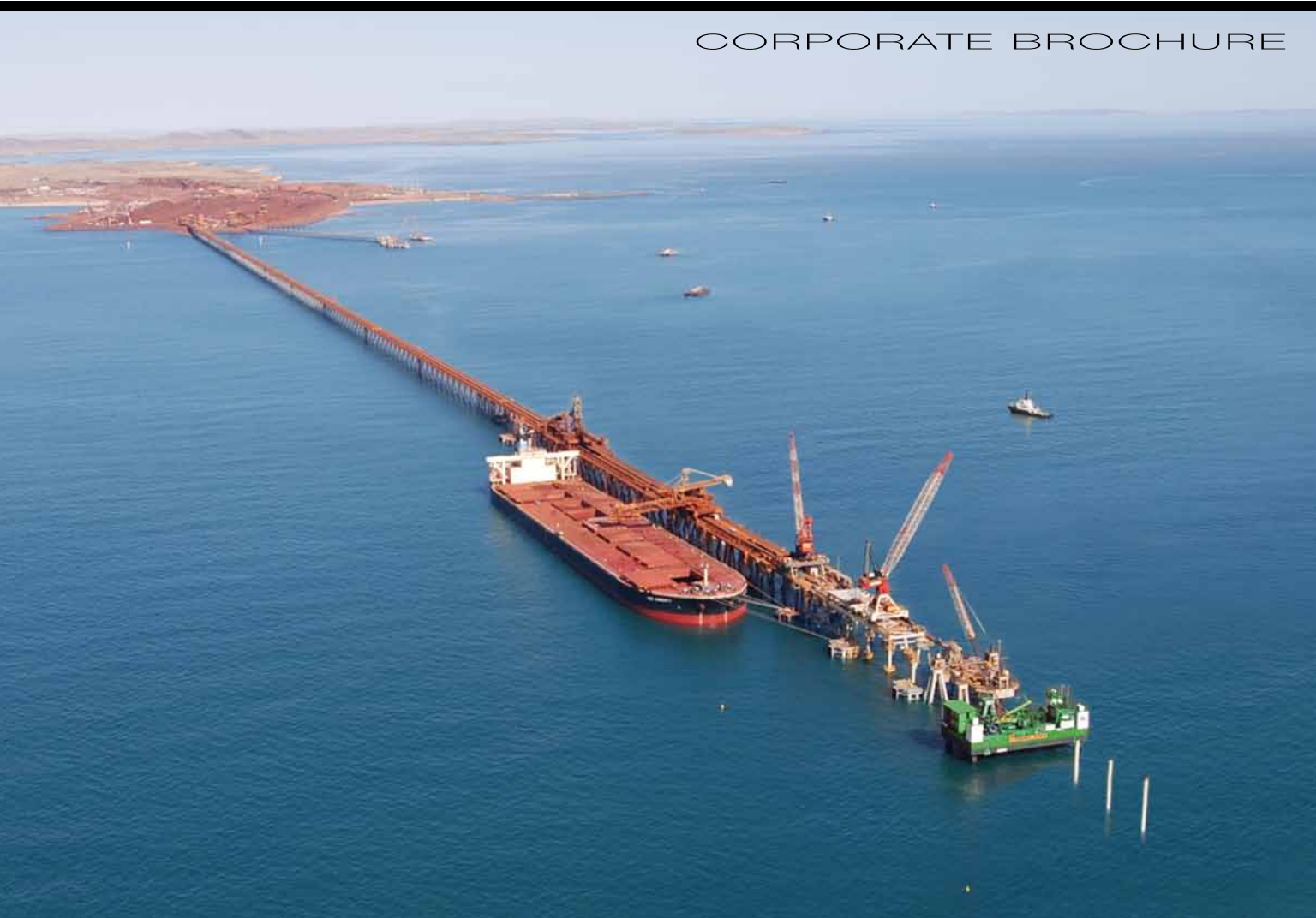


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Making waves

GeoSea, part of the DEME group of companies, has applied a pioneering approach to a host of underwater construction challenges. Business development manager Bart De Poorter talks to Jayne Alverca about the company's flair for innovation

In a trading history that dates back over 150 years, DEME has achieved worldwide recognition for its contracting services in dredging, environmental and marine engineering. GeoSea is a specialist company within the group that was formed specifically to focus on geotechnical surveys, rock socketing, drilling and installation services for jetty foundations and mooring systems; the installation of offshore structures such as small platforms and outfalls; and in particular, offshore wind farms.





In recent years, the development of offshore wind farms has been identified as having a major role to play in meeting Europe's energy needs; and GeoSea is recognised as a leading player in this sector.

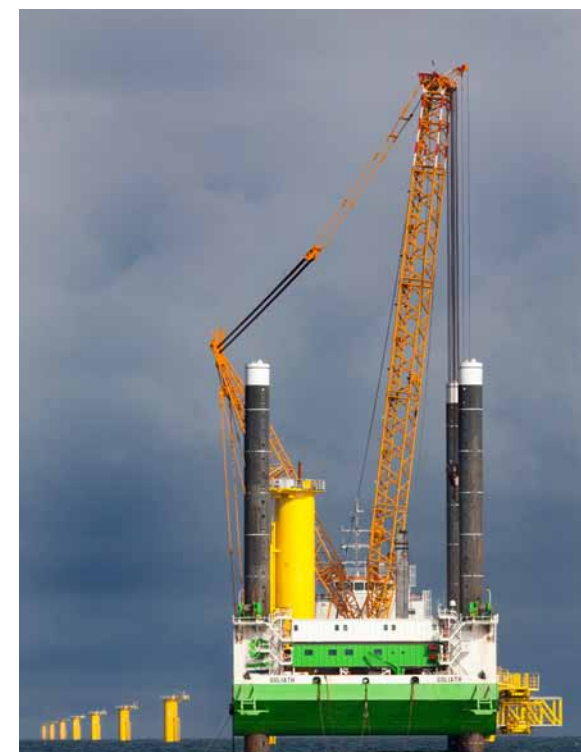
"Innovation is a key word for us," states business development manager Bart De Poorter. "We believe in being a pioneer and we were one of the first companies to work on the installation of offshore wind farms. One of our most notable achievements is that we are the only company to date that has succeeded in proving the feasibility of jacket foundations in offshore wind installations."

The so-called jacket foundation consists of a braced steel structure to support the wind turbine which is secured in the ground by four driven piles. GeoSea has developed a unique template method which makes the piling process faster, more accurate and safer. The company has replaced the conventional piling frame which consists of two separate steel structures with a single piling template. The accurate position of the four piles in a square formation is guaranteed by the rigid structure of the template; and the need for a complex series of measurements to precisely position the piles is eliminated.

Adoption of this single template means that all heavy lifting, which would normally require a massive crane for the positioning of the steel frames, is now no longer necessary. The template can be lifted and lowered with four winches and stored beneath the hull as the platform sails to its next location. Because only one frame is used, ROV operations are no longer required. This saves more time, cost and delays as ROV operations are highly weather-sensitive.

"The Ormonde wind farm project in the Irish Sea was the first project where we applied this new template innovation and it confirmed the results we had anticipated; namely, a safer execution of the works and a huge gain in net working time."

GeoSea is currently at work on the Thornton Bank wind farm off the Belgian coast. This will have a total capacity of 60 wind turbines producing in total 300MW. De Poorter explains that a typical offshore wind turbine comprises a nacelle, or blade, supported by a tower up to 100 metres above sea level. A hub is connected to the nacelle for holding the rotor blades, which can have a





length of 60 metres or more. With increasing turbine capacity, the nacelle and the hub alone typically account for 350 tons in weight.

At the Thornton Bank phase 1 installation, the nacelle was out of the crane capacity of the jack-up rig. A heavier crane or use of counterweights would have meant a significant increase in installation cost and a reduction of the working space on deck. “We had to find a simple and cost-effective solution which we achieved by introducing counter-balances connected to the jack-up platform using a series of lifting lugs. We also discovered that it is possible to easily enhance the lifting capacity of a crane by increasing the number or dimensions of the lifting lugs.

“As a result, we could transfer a large part of the force to the jack-up platform and avoid the need for a bigger, more expensive crane,” he continues. “Being able to use a smaller crane also means that the equipment takes

up less space and makes assembling or servicing structures at sea much easier to perform.”

An innovative approach is supported by investment in state-of-the-art plant. The large jack-up platforms operated by GeoSea—De Zeebouwer, Vagant, Buzzard, Goliath and newcomers Neptune and Innovation—are among the most sophisticated ever built for operations in water depths up to 40 to 60 metres. “We own our own fleet of equipment, which is highly unusual in the contracting business where chartering is the norm. We also have a great deal of expertise in getting the most out of our plant in situations where others would need bigger, heavier and more expensive machinery,” he says, adding that GeoSea has its own in-house engineering team who can optimise and restructure the equipment according to its application.

The DEME group employs over 4,000 people and offers a great pool of additional expertise and resources that can be drawn upon at any time. It also enables the company to retain the expertise of



a permanent team. De Poorter explains that it is a cyclical business owing to the tempestuous weather conditions of European seas in the winter. When it is not possible to undertake works in Europe, the teams can be re-deployed elsewhere in the group.

The company has seen its turnover double in all but one of the last five years and having established such a strong reputation for GeoSea in offshore wind farm installations, De Poorter is now keen to see the company diversify. He believes there is a particularly strong opportunity in the de-commissioning of

redundant offshore platforms and the company has already executed a number of high profile marine engineering projects in other sectors, notably the construction of an aggregates loading facility in Oman and Australia which took place under the most challenging geological conditions.

“At present, 60 to 70 per cent of our turnover is derived from the wind farm business. Now we want to achieve a better balance by consolidating our presence in other markets, which will be helped by the strong civil works department we are building up at the moment. We have shown on a number of projects our determination to find solutions to the most complex operational challenges and now we want to apply that expertise to other markets,” he concludes. www.geosea.be ■

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