

OFFSHORE CHANNEL

WORLD TREND & TECHNOLOGY FOR OFFSHORE ENERGY SECTOR

Offshore Renewable Energy



- Wind Energy
- Wave Energy
- Tidal Energy
- Solar Energy



Farshid Ebrahimi
Responsible Director

Offshore renewable energy consists of many different sources that are abundant, natural and clean, like Wind, Wave, Tidal and Solar. Unlike traditional fossil fuels, this energy will never run out. Renewable energy is essential for reducing the potentially devastating effects of climate change, and protecting the natural environment for future generations. Offshore renewable energy includes offshore wind, wave, tide and solar, where the strength of the wind, the pull and rise and fall of the tides, and the movement of waves, produces a vast amount of power that can be harnessed by modern technology.

The energy of the oceans can be harnessed by modern technologies without emitting any greenhouse gases, making offshore renewable energy a potential cornerstone

of the clean energy transition all around the world.

Offshore Channel Magazine reports on innovative engineering projects around the world, profiling the key players making a difference to the engineering profession. It's our flagship publication and our main channel for keeping our members up to date on what's happening at the offshore industry.

Offshore Channel Magazine is the flagship publication of the international Society of Professional Engineers. Published six times per year, Offshore Channel Magazine covers news and commentary on professional issues: licensing, engineering ethics, employment, legislative and regulatory issues, education, and many others that have a direct impact on professional engineers.

Heavy Lift vessel "Seaway Alfalift" with TP's onboard
Frank van der Linden
Havenvrienden Rotterdam
Oudkerk B.V.

We would like to thank the magazine
cover photographer, Frank van der
Linden, for their stunning work.



MIGHTY SERVANT 1 REACHES HAUGESUND WITH DOLWIN EPSILON CONVERTER PLATFORM

Heavy transport vessel **Mighty Servant 1** has completed its journey from the Seatrium shipyard in Singapore to the Aibel shipyard in Haugesund, Norway, with the 900 MW DolWin Epsilon platform aboard. The 23,000-ton HVDC converter platform will transmit the wind-generated electricity from several German offshore wind farms to the onshore power grid.

In its brief statement, Boskalis said that the **Mighty Servant 1** has been specially modified for the transport of this green energy converter. At crucial points, the deck has been widened with four outriggers, which support the four massive columns of the DolWin Epsilon.

The vessel set off from Singapore in October and has now completed the journey of 13,000 nautical miles taking it around the Cape of Good Hope. Now that it has arrived in Norway, Aibel, as a partner of the consortium Aibel / Seatrium (formed from a combination of Sembcorp Marine and Keppel Offshore & Marine), will carry out the final technical equipment installation.

Further Hitachi Energy as Aibel's subcontractor and supplier for the HVDC technology, will install the converter and transformers. During the summer of 2024, the platform will be transported self-floating and installed at its final destination in the German North Sea.





FIRST COASTAL VIRGINIA OFFSHORE SUBSTATION ARRIVES IN DENMARK

The first of three 880 MW offshore substations being built for Dominion Energy's Coastal Virginia Offshore Wind (CVOW) project has arrived at the Bladt Industries production site in Aalborg, Denmark, for outfitting from a prefabrication site in Spain.

Denmark-headquartered Bladt Industries is responsible for the design, procurement, and manufacturing of the steel structures and jacket foundations for the substations, while the design, procurement, and installation of electrical equipment, energy systems, and inter-array cables will be managed by Semco Maritime.

Along with the substations' steel structures and foundations, Bladt will also deliver the transition pieces (TPs) for the offshore wind farm's wind turbine foundations under a separate contract secured with the developer.

When it is done, each 880 MW offshore substation will weigh 3,800 tonnes, not including the jacket foundations or the pin piles.

As previously reported, Dominion Energy selected the consortium of DEME Group and Prysmian as the Balance of Plant (BoP) contractors for the transportation and installation of the foundations and the substations and the engineering, procurement, construction, and installation (EPCI) services for the inter-array and export cables for the project.

DEME Offshore will oversee the complete offshore installation works for the foundations, substations, and infield cables, as well as part of the export cables.

Prysmian Group will provide the export cables and 320 kilometres of 3-core 66 kV offshore inter-array cables with XLPE insulation for the wind farm.



FIRST MORAY WEST TRANSITION PIECES ARRIVE AT PORT OF NIGG

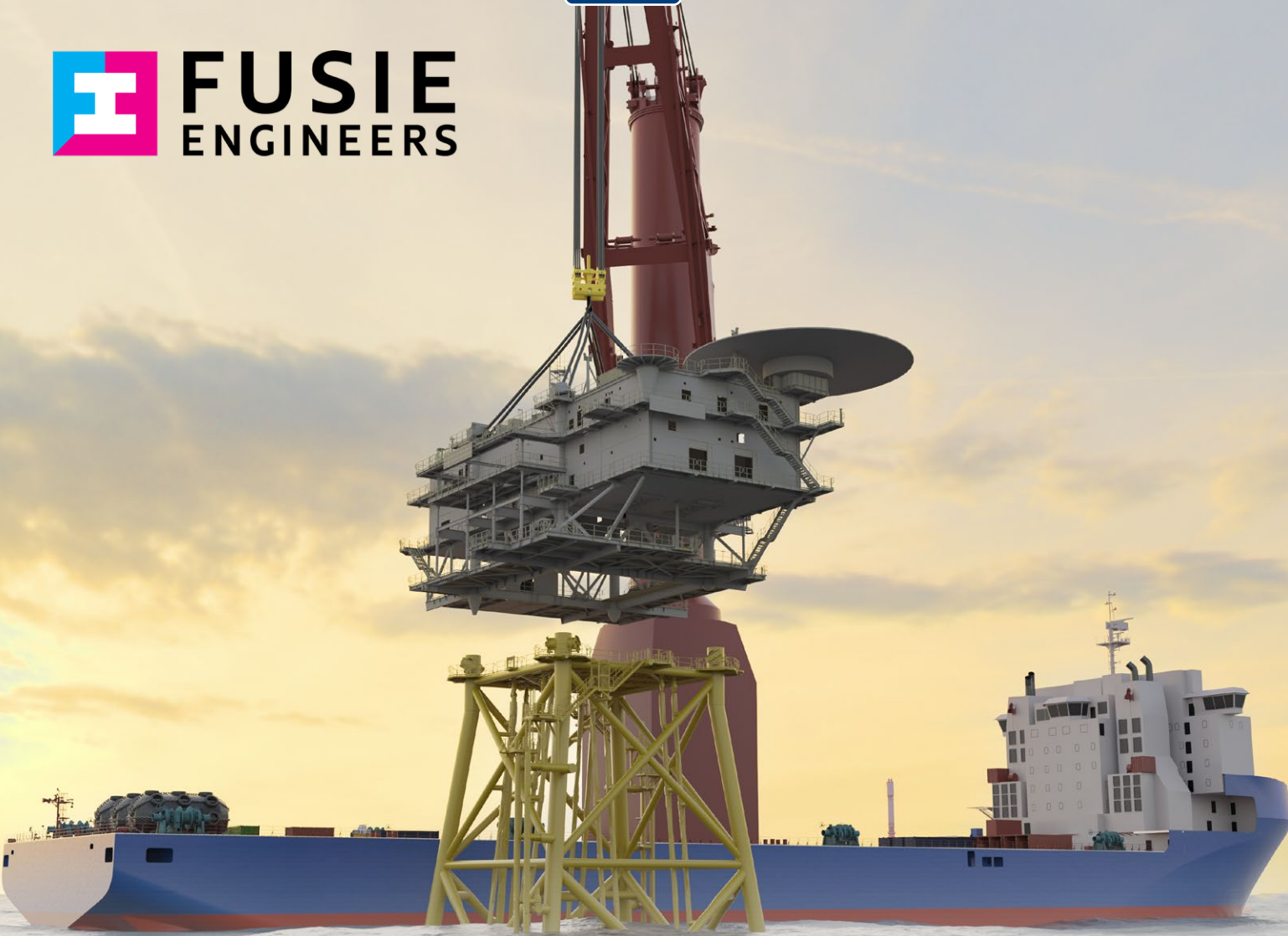
The first batch of transition pieces (TPs), that will be installed at the Moray West offshore wind farm, has arrived at Port of Nigg in the Cromarty Firth.

The first delivery to Nigg included two TP's for the offshore substations, allowing progress on the export electrical infrastructure to be made, said Ocean Winds.

As part of this critical infrastructure, Global Energy Group's (GEG) fabrication division completed the fabrication of two J-Tube cages, which will be integrated with the TP's and protect the cables coming from the wind turbines into the offshore substations, as well as the cables exporting the power to shore.

In total, 62 TP's will be delivered to Nigg on a rolling programme of delivery and installation, with GEG providing pre-assembly support services including craneage, logistics, mounting ancillary equipment, and inspection and repair support.

"We are delighted to welcome the Transition Pieces for the Moray West project to our Port of Nigg facility. We are now in the process of offloading these impressive structures, supported by our onsite logistics and vessel support teams," said Charlie Morrison, Operations Director at GEG and Port of Nigg.



EXCITING NEWS: FUSIONENGINEERING IS NOW FUSIE ENGINEERS!

Our new name reflects our founders' roots in the Netherlands and India, "FUSIE" (Dutch for Fusion) symbolizes our blend of global expertise. We have managed to fuse together the best of both worlds by leveraging our expertise and experience to design efficient and sustainable solutions for our clients, spanning Denmark, Norway, France, Taiwan, UK, India, USA, and more.

This name change provides a unique and unambiguous name and that is exactly what we need to realize our plans for the future. With our team of more than 40 designers, structural engineers, and naval architects, we expand our services worldwide with a focus on offshore wind, maritime and traditional energy sectors.

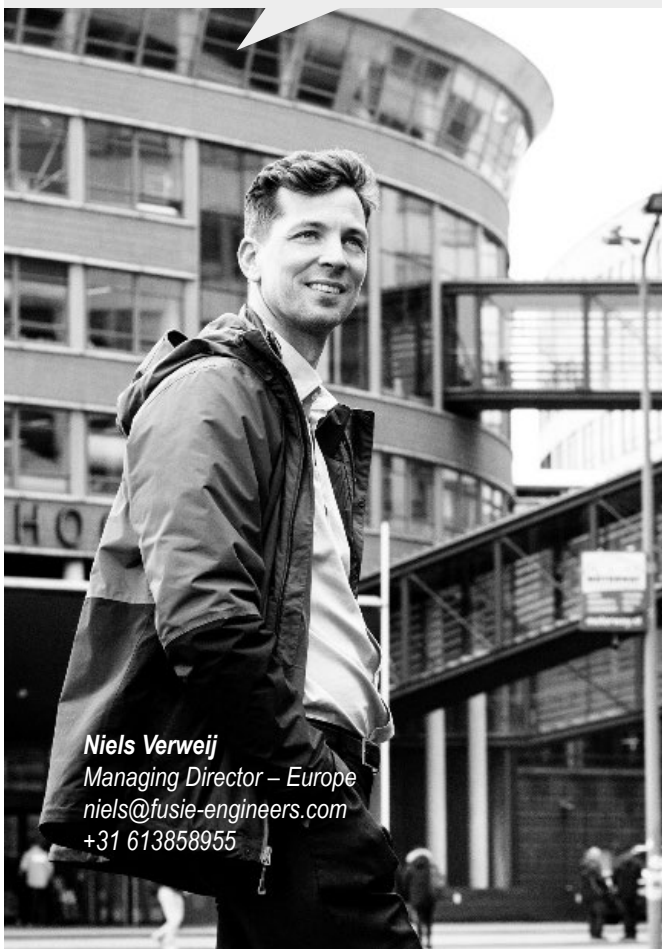
A quick word from the Founders of FUSIE Engineers (formerly FusionEngineering)

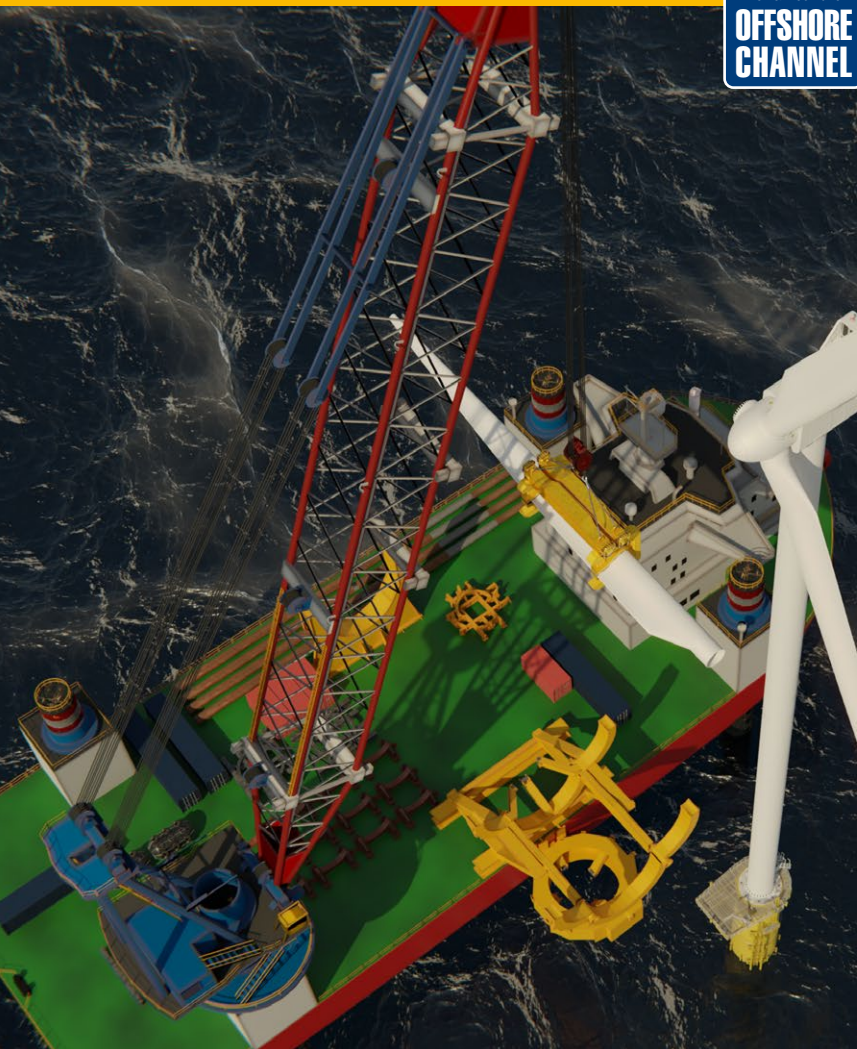
“I oversee sales and technical client interactions across Europe, and with over 15 years in the industry, I’ve built a substantial network. This constantly expanding network, together with an impressive track record of successful projects, has enabled us to get a foothold in the European renewable energy market.

As someone who thrives on personal connections, I enjoy working closely with clients to understand and address their challenges. Often, it’s our willingness to go the extra mile, even before a contract is signed, that convinces clients to choose us over larger corporate competitors.”

“Being a relatively young company, we’ve certainly faced our fair share of challenges over the years. Building a strong team capable of consistently delivering high-quality work and expanding our client base has been a demanding journey that required patience, persistence, and an abundance of hard work. These core values are just as essential to our path forward, but I’m proud to say we’ve achieved a level of steadiness in our workflow and are confident in the current state of our internal processes. They are effective, reliable, and deliver results.

While there is always room for improvement, we believe we are in the ideal position to actively grow our client base, introduce new services, and branch out into new geographies. It might sound cliché, but our clients truly come first. When deadlines loom, we don’t hesitate to put in the extra hours, work through weekends if needed, and do whatever it takes to ensure on-time, on-budget delivery of the quality our clients expect.”





In the field of offshore renewable energy, a lot of our projects revolve around the design of seafastening grillages and custom tools, which are needed for the safe transportation and installation of wind turbine foundations and their components.” We’re acutely aware of the complexities that the marine environment presents, and we place paramount importance on the reliability of the structures we design.

When we launched few years ago, our focus was primarily on design, working hand-in-hand with our clients on the structural calculations. It was a strategic ‘divide and conquer’ method that served us well. Since then, we’ve significantly expanded our capabilities. Today, we offer our clients a comprehensive suite of services that encompass everything from the initial concept design and detailed 3D modelling to the creation of fabrication drawings and the preparation of structural analysis reports needed for MWS and class approvals. We’ve handled around 50 projects, both large and small, navigating them through the approval process—be it with DNV, Lloyd’s Register, or ABS. Our expertise and efficiency have allowed us to clear these reviews in just a few weeks consistently, ensuring that there’s no disruption to the design or the fabrication timeline.”





Pretty much all projects we involve ourselves in, also has a scope connected to heavy lifting. Clients are routinely dealing with transport of substations, foundations for wind turbines, and the turbines themselves, all of which are high value assets. Everyone in the industry knows what happens when a lift does not go as planned. Hence naturally all our clients want to make sure that these lifts are done precisely, safely, and on schedule. We work alongside some of the biggest names in the industry to ensure their heavy lifting plans are on point. Our process? We craft detailed lifting and rigging plans are sent to clients, the Marine Warranty Surveyor (MWS), and the project owner. We also had a few cases where SPMT's were involved, and we did the calculations and drawings for those too.

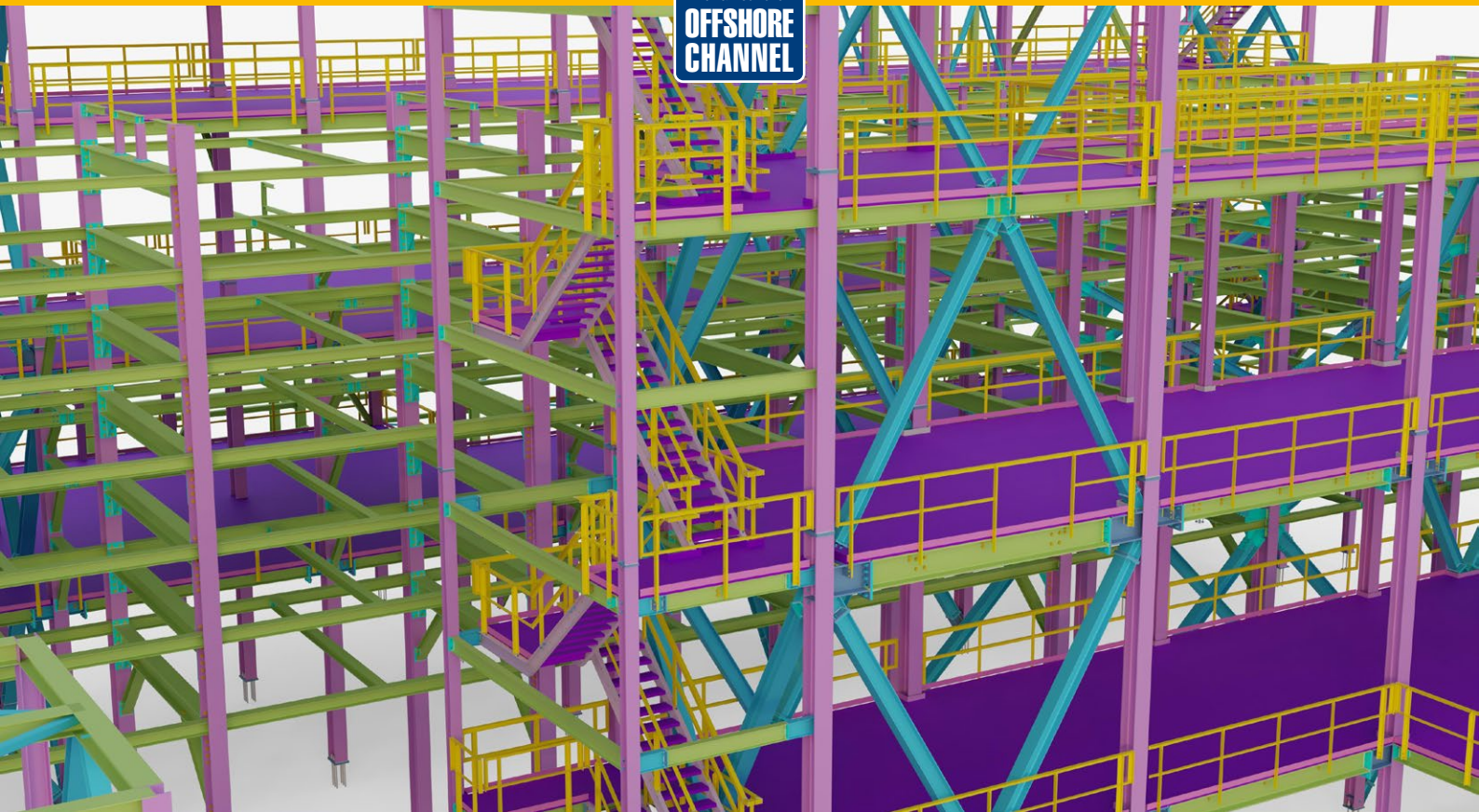




“Marine Engineering, particularly predicting the impact of harsh marine conditions on assets, is a facet that I find incredibly fascinating,” says Jose. “It’s a critical element in virtually all our projects. Understanding the unpredictable metocean climate and how a floating asset behaves in such conditions is key to every sea transport or marine operation we undertake. Higher accelerations mean more steel, leading to increased costs. More dynamic motions during lifting result in reduced workability, often leaving vessels idling for days. Every result from a marine analysis has a tangible impact on the overall operational costs – a reality every offshore company must navigate.

However, it’s not always about complex solutions. Sometimes, using default motion criteria is enough rather than a detailed diffraction analysis in ANSYS AQWA. A quick stability check based on the stability booklet might suffice instead of a detailed intact and damage stability analysis in GHS or AutoHydro. It really depends on the project’s needs and the consequences of the analysis results. If a fully dynamic analysis in OrcaFlex can significantly reduce project costs and operational downtime, then the effort and expense are justified.

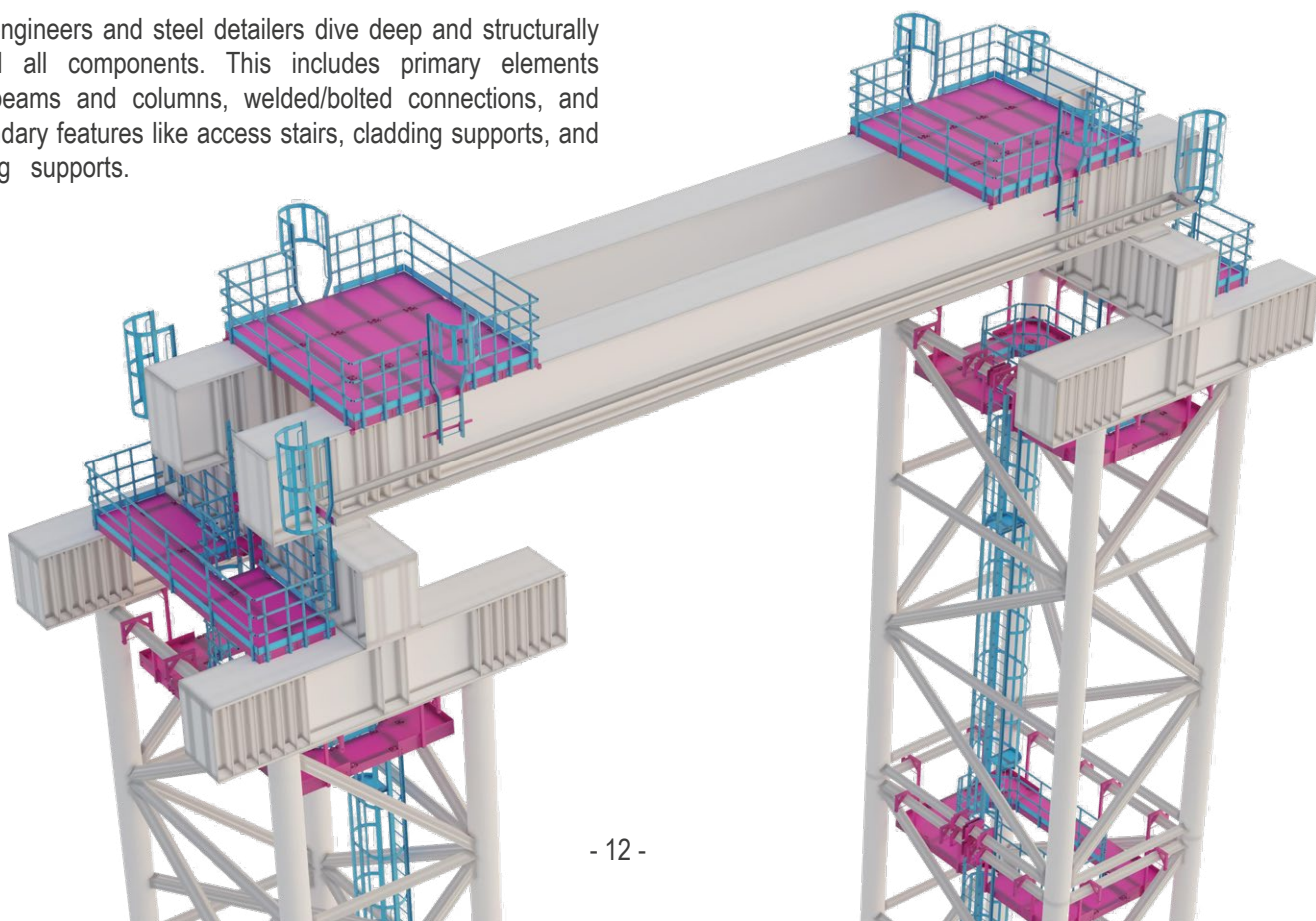
Our approach at Fusie Engineers is to keep it as simple as possible yet as detailed as necessary to ensure optimal workability for our clients. My experience with complex operations, like the salvage operation with a semi-submersible vessel or lowering a 9000-ton caisson to the seabed in Morocco or conducting mooring analysis for the vessel that built Europe’s second-largest suspension bridge, gives me the perspective needed to effectively tackle each project.”

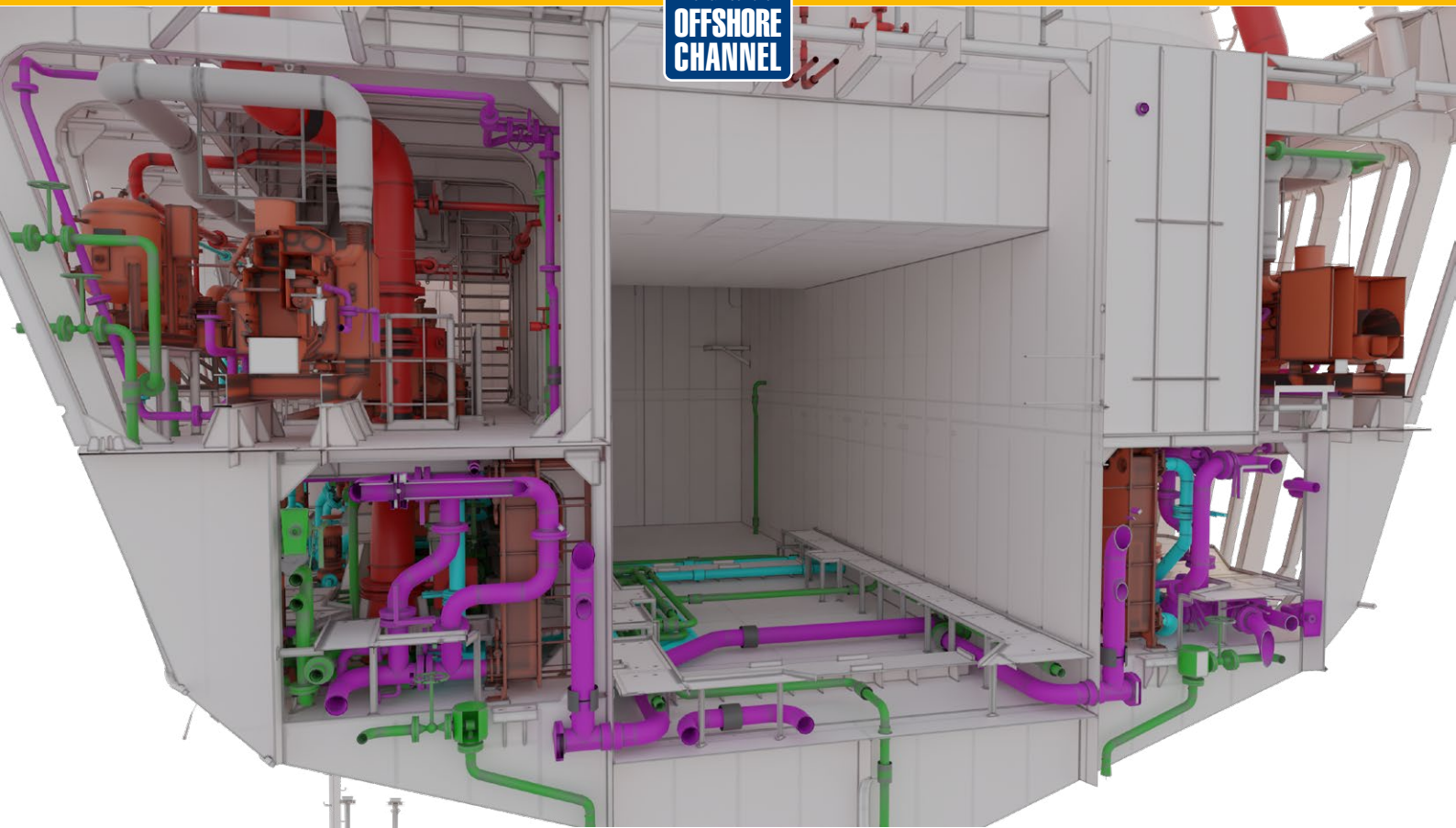


While our primary focus at Fusie Engineers is on designing steel structures for offshore marine environments, we occasionally delve into onshore steel constructions too, like process plants, warehouses, and commercial buildings,” I remarked. “Sure, the loads and load combinations differ from those in offshore settings, but the core principles of offshore steel design are surprisingly transferable. Instead of considering wave-induced vessel accelerations, we deal with seismic and ice loads. And rather than designing interfaces with a vessel structure, we’re focusing on connections to concrete foundations.

Our engineers and steel detailers dive deep and structurally model all components. This includes primary elements like beams and columns, welded/bolted connections, and secondary features like access stairs, cladding supports, and roofing supports.

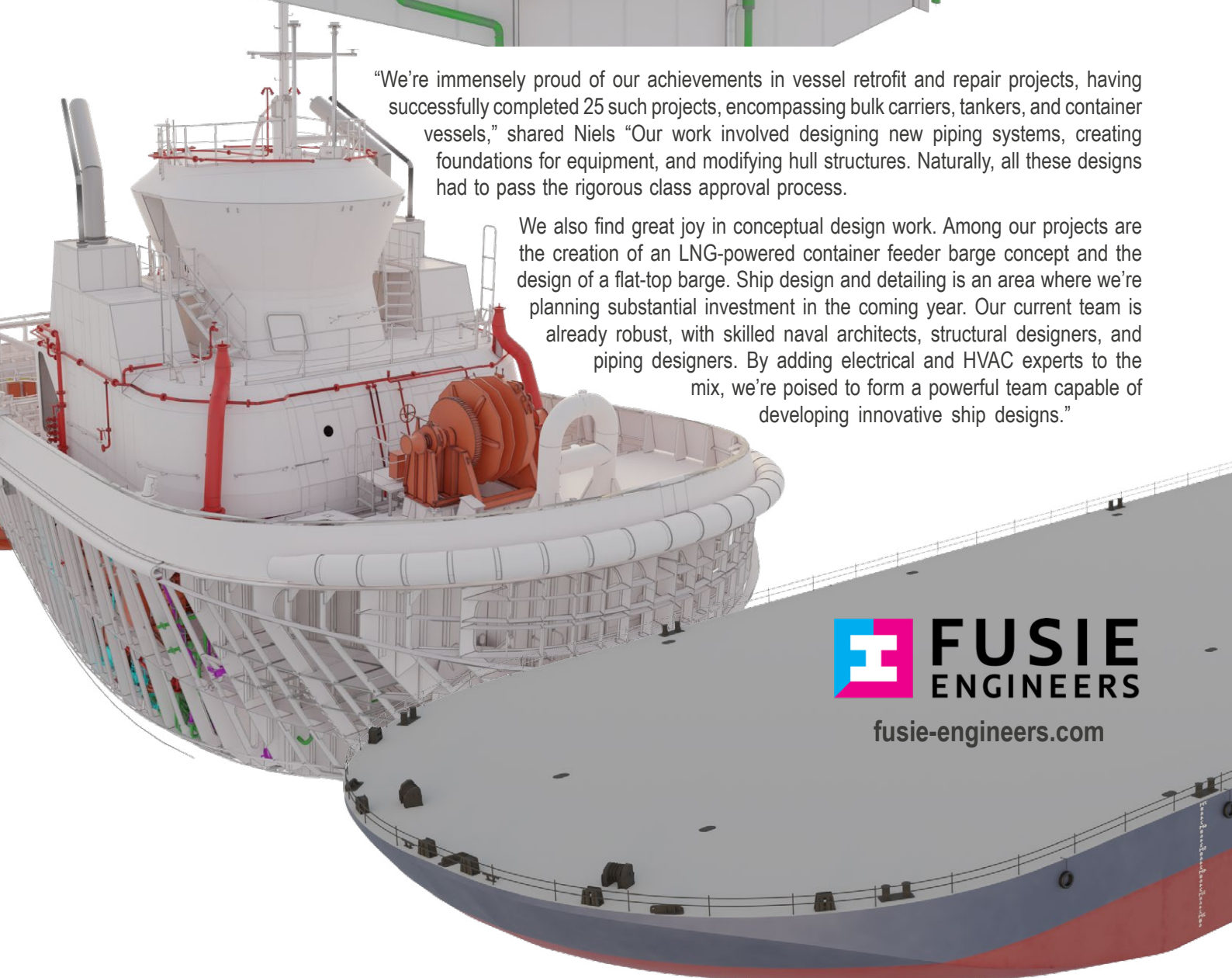
We approach each steel connection with two things in mind: strength and ease of erection. Our goal is to maximize the amount of steel fabrication and welding done in the workshop, minimizing on-site erection time. Clear and precise General Arrangement Drawings, Anchor Plans, Shop Drawings, and Erection Drawings are crucial for ensuring a smooth construction process post-design.”





“We’re immensely proud of our achievements in vessel retrofit and repair projects, having successfully completed 25 such projects, encompassing bulk carriers, tankers, and container vessels,” shared Niels. “Our work involved designing new piping systems, creating foundations for equipment, and modifying hull structures. Naturally, all these designs had to pass the rigorous class approval process.”

We also find great joy in conceptual design work. Among our projects are the creation of an LNG-powered container feeder barge concept and the design of a flat-top barge. Ship design and detailing is an area where we’re planning substantial investment in the coming year. Our current team is already robust, with skilled naval architects, structural designers, and piping designers. By adding electrical and HVAC experts to the mix, we’re poised to form a powerful team capable of developing innovative ship designs.”



 **FUSIE
ENGINEERS**

fusie-engineers.com



FIRST GERMAN ZERO-SUBSIDY OFFSHORE WIND FARM STARTS TAKING SHAPE

Offshore installation work has started at the 913 MW Borkum Riffgrund 3, the first subsidy-free offshore wind farm in Germany to reach this development phase, Ørsted, the developer of the project, said.

The first of the 83 monopile foundations have now been installed at the site some 53 kilometres off the island of Borkum in the German North Sea by Jan De Nul's Lez Alizés.

The installation directly follows the foundation work in the adjacent 253 MW Gode Wind 3 project, which is being built in parallel by Ørsted in the North Sea.



BLADT
INDUSTRIES

FIRST TRANSITION PIECES PAINTED FOR COASTAL VIRGINIA OFFSHORE WIND

This month, we reached one of the milestones of the Coastal Virginia Offshore Wind project for our customer Dominion Energy; The first painted TP.

The TPs are now stored on site at Aalborg Port, Denmark, ready for further processing.

Coastal Virginia Offshore Wind Farm will be established some 40 kilometers off the Virginia U.S. East Coast. Once the Coastal Virginia Offshore Wind Farm is complete, it will provide energy for up to 660,000 homes.

The transition pieces are up to 26.6 meters high and 7.5 meters in diameter. Each element weighs approx. 570 tons.



“The transition piece is painted yellow to improve visibility once the tower and turbine is installed offshore. It is a polyurethane topcoat, which is resistant to sunlight.”

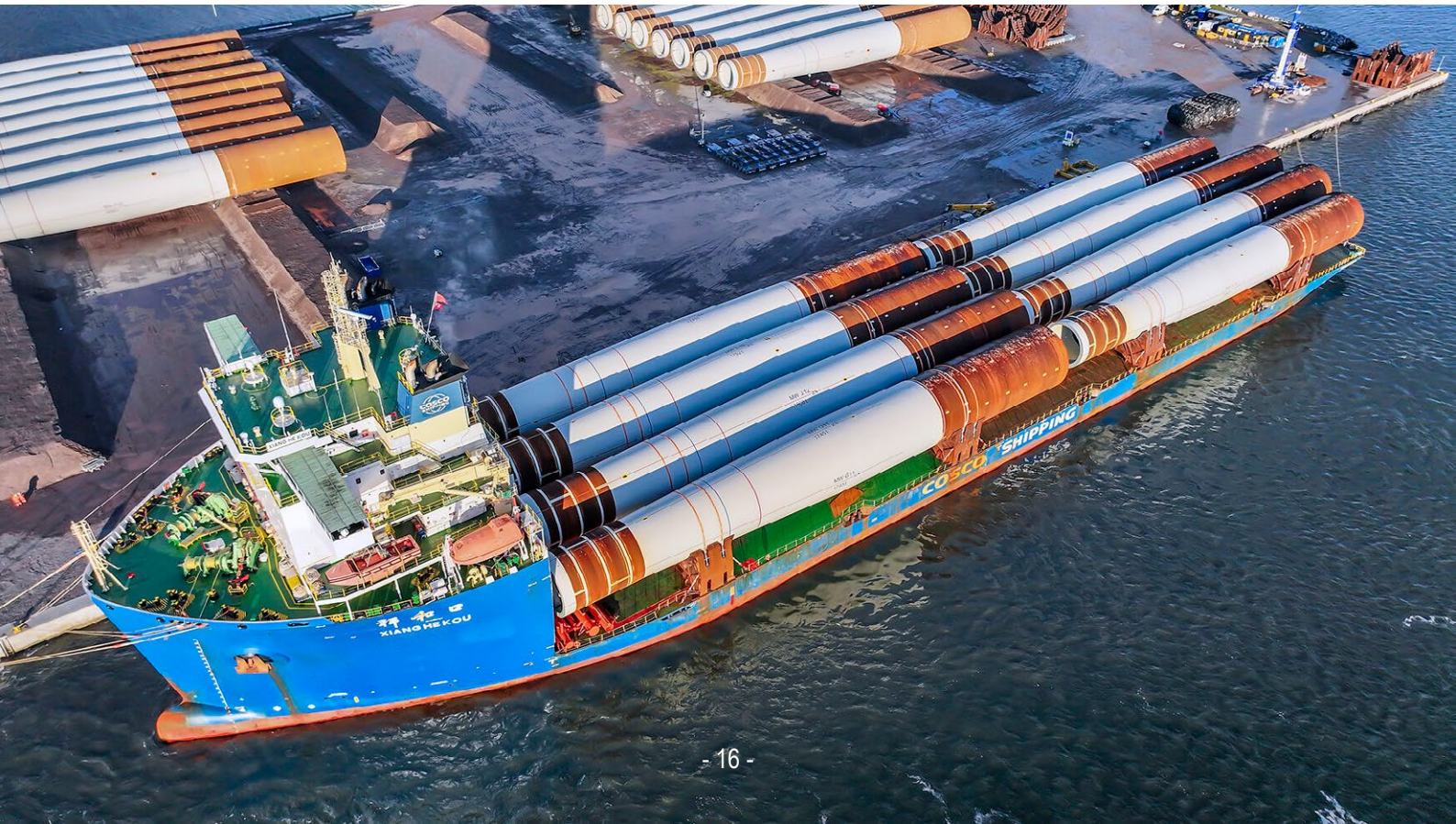
Henrik Jensen





The Sarens PSG team has safely executed the load in of a further 8 XXL monopiles from Cosco HTV Xiang He Kou, at the Invergordon Monopile IDP.

The monopiles weighing up to 2000mt are destined for the 882MW Moray West Offshore Windfarm in the outer Moray Firth. Sarens PSG are a market leading provider of port marshalling services, assembly, deployment and integration solutions across Scottish marshalling harbours.





23 Degrees Renewables Ltd

an OEG Group company

23 Degrees Renewables, an OEG Renewables company, has launched a new cable pull-in package for export and inter-array cables to offshore structures.

OEG Energy Group Limited (“OEG”, the “Group”), a leading offshore solutions business, is pleased to announce that 23 Degrees Renewables (“23D”), an OEG Renewables company, is adding a new cable pull-in package for export and inter-array cables to offshore structures.

This new service offering by 23D is a critical operation during the construction and maintenance of offshore wind farms as inter-array cables are connected to wind turbines and other offshore infrastructure. 23D are specialists in offshore, near shore and onshore cable installation, deploying state-of-the-art cable pull-in equipment and technology, with a Safety-First Approach, and end-to-end project management.

Being part of the OEG group allows access to a global infrastructure of offices and facilities giving 23D the capability to provide their specialist cable installation services to clients in strategic locations around the world. It also offers the opportunity to provide integrated solutions for our clients, leveraging OEG’s expanded subsea, topside, and marine services offering.

Grahame Tate, 23D Managing Director said: “This is an exciting development for 23 Degrees Renewables as we further strengthen our service offering. The addition of these offshore services underscores our commitment to growth and innovation, allowing us to better serve the evolving needs of our clients in the dynamic offshore energy sector. Being a part of the OEG group, we anticipate a robust outlook for servicing offshore cable handling projects in the UK and elsewhere in the world.”



GWSHI SIGNS XXL MONOPILE CAPACITY RESERVATION AGREEMENT WITH INCH CAPE

Guangzhou Wenchong Shipyard Heavy Industry (GWSHI) has signed a capacity reservation agreement with Inch Cape Offshore Limited (ICOL) for a quantity of XXL monopile foundations for the 1.1 gigawatt Inch Cape Offshore Wind Farm.

The agreement secures the supply, fabrication and delivery of monopile foundations for the wind farm which is currently progressing towards full construction. The project will comprise up to 72 wind turbines sited in the North Sea 15 kilometres from the east coast of Angus in Scotland.

XXL monopiles are designed for the latest generation of offshore wind turbines. The Inch Cape monopiles will each have a maximum outer diameter of 11.5 metres (m), a maximum length of 110m and a weight of up to 2,700 tonnes.

Fabrication of the monopiles is due to commence in late 2024 with delivery to the project scheduled for late 2025.

ICOL, owner of Inch Cape Offshore Wind Farm, is an equal joint venture between Edinburgh-based renewable and sustainable energy company, Red Rock Power Limited and Ireland's leading energy company, ESB.



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FIRST LOW-CARBON FLOATING WIND INSTALLATION VESSEL GETS UK FUNDING

The UK government has awarded funding to a consortium led by Morek Engineering to design a new class of low-carbon installation vessel for the floating offshore wind market.

The consortium, which includes Morek Engineering, Solis Marine Engineering, Tope Ocean, First Marine Solutions and Celtic Sea Power, won the funding through the UK Government's Clean Maritime Demonstration Competition.

The outline vessel design will be ready for engagement with

classification societies to achieve approval in principle by early 2025.

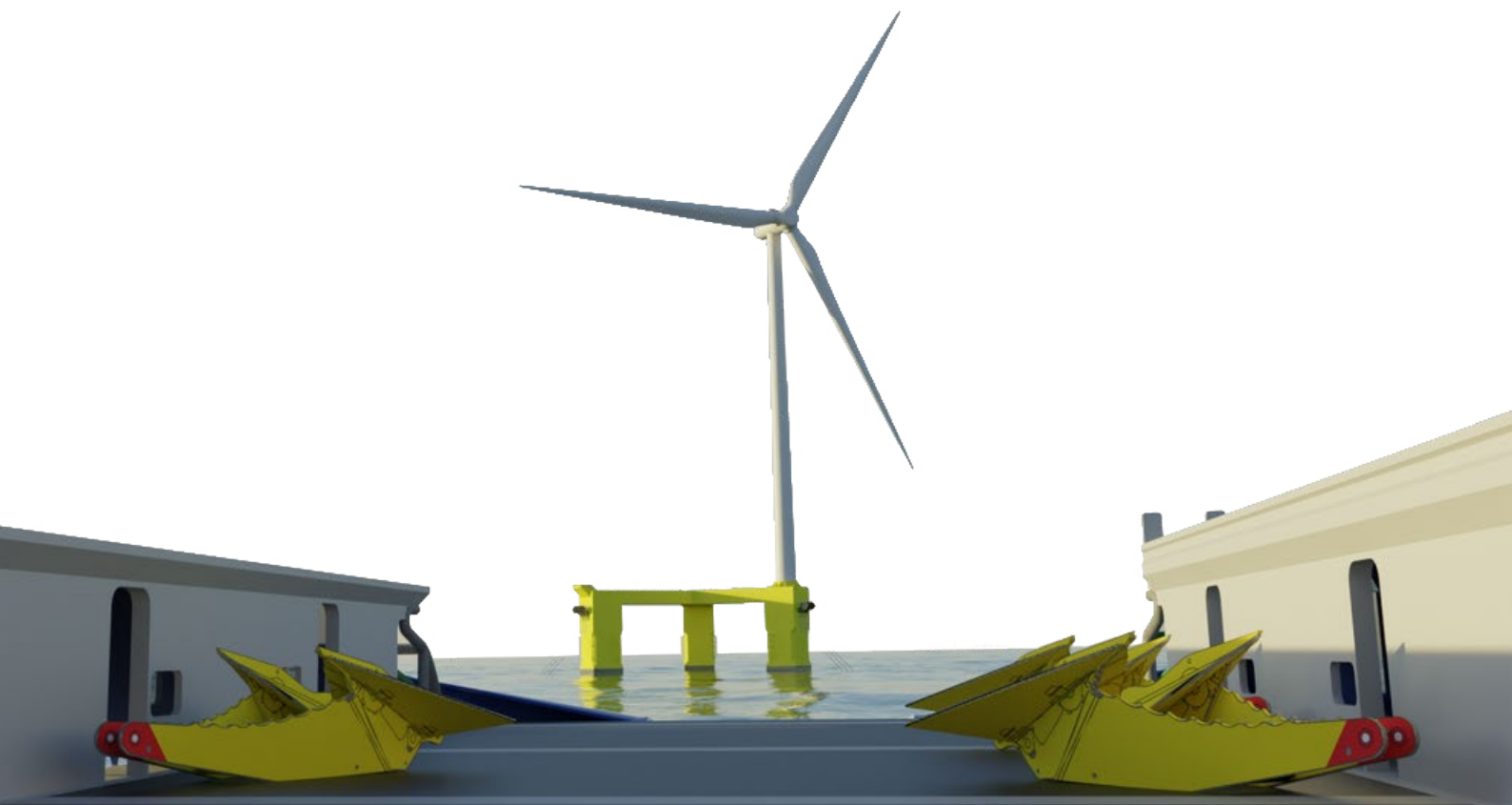
"This will be a first-in-class low-carbon vessel designed specifically to meet the complex installation requirements of floating offshore wind farm moorings and foundations. The project aims to align the detailed requirements of the emerging Floating Wind sector with the objectives of the UK maritime decarbonization agenda.

"Floating offshore wind needs a cost-effective solution to deliver serialized installation of huge moorings and floating foundation systems, whilst minimizing carbon emissions during the construction and maintenance of the next generation wind farms. We are going to develop the next generation of offshore wind construction vessels, meeting the challenge head on," said Bob Colclough, MD of Morek Engineering.

According to Ian Godfrey, MD of Tope Ocean, the project will entail a highly detailed feasibility study into the requirements of the emerging global floating offshore wind sector for a new class of low-carbon installation vessel.

"The new vessel will be designed to carry out complex, high-energy construction tasks within the duty cycle constraints of future low and zero-carbon fuel systems," Godfrey said.

The latest round of Clean Maritime Demonstration Competition is part of the Department's UK Shipping Office for Reducing Emissions (UK SHORE) program, a \$260 million (£206 million) initiative focused on developing the technology necessary to decarbonize the UK domestic maritime sector.





GAZELLE WIND POWER AND TUGDOCK JOIN FORCES TO REDUCE COSTS FOR FLOATING OFFSHORE WIND

Gazelle Wind Power, developers of a next-generation floating offshore wind platform, and Tugdock, developers of the world's first road-transportable floating dry dock, have signed a Memorandum of Understanding to co-develop a modular offshore wind assembly system.

Jon Salazar, CEO of Gazelle Wind Power, commented, "Working with Tugdock, we have the ideal way to assemble our modular platform, using minimal port space. While the Gazelle platform possesses a naturally low draft, there are significant benefits to assembling the modules on the Tugdock submersible platform, which doubles as the assembly fixture and launch method, speeding up platform assembly and

getting our platform into the water in a safe, and cost-effective way. This partnership is driving the production rates up and costs down."

The first project for the new partnership will be Italy's largest offshore wind farm, the Molise Offshore Wind Farm project in the Adriatic Sea, where the combined technologies will help install 70 turbines.

Shane Carr, CEO of Tugdock, said,

"This pioneering partnership combines the advantages of two innovative modular technologies that complement each other perfectly."





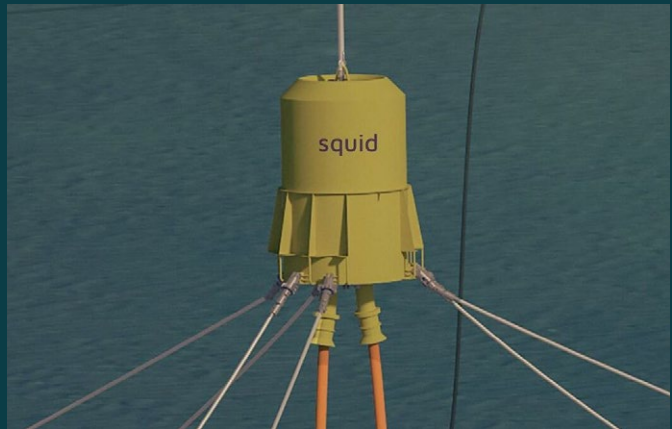
SCOTTISH START-UP UNVEILS FLOATING OFFSHORE WIND INSTALLATION SOLUTION

Encomara, a Scottish newcomer, has launched a solution for the installation of floating offshore wind turbines. The company’s turbine installation technology, designed to enhance life-cycle efficiency, safety, sustainability, and reliability, is applicable regardless of water depth, according to Encomara.

The company’s pioneering Strategic Wind InFrastructure (SWIFT) system is said to integrate new and established technologies in a holistic and life-cycle cost approach for floating wind which could reduce the levelized cost of electricity.

Encomara’s first patented product, SQUID, is a quick connector for power cables, mooring lines, and anchor interfaces, which provides a rapid and simplified plug-to-power capability.

The pre-installation and pre-commissioning of all marine hardware could reduce cost and risk by enabling rapid deployment of multiple floating offshore wind turbines.



Additionally, by enabling a viable tow-to-port methodology, SQUID delivers similar cost and duration reductions during the operational, re-power, and decommissioning phases, according to Encomara.

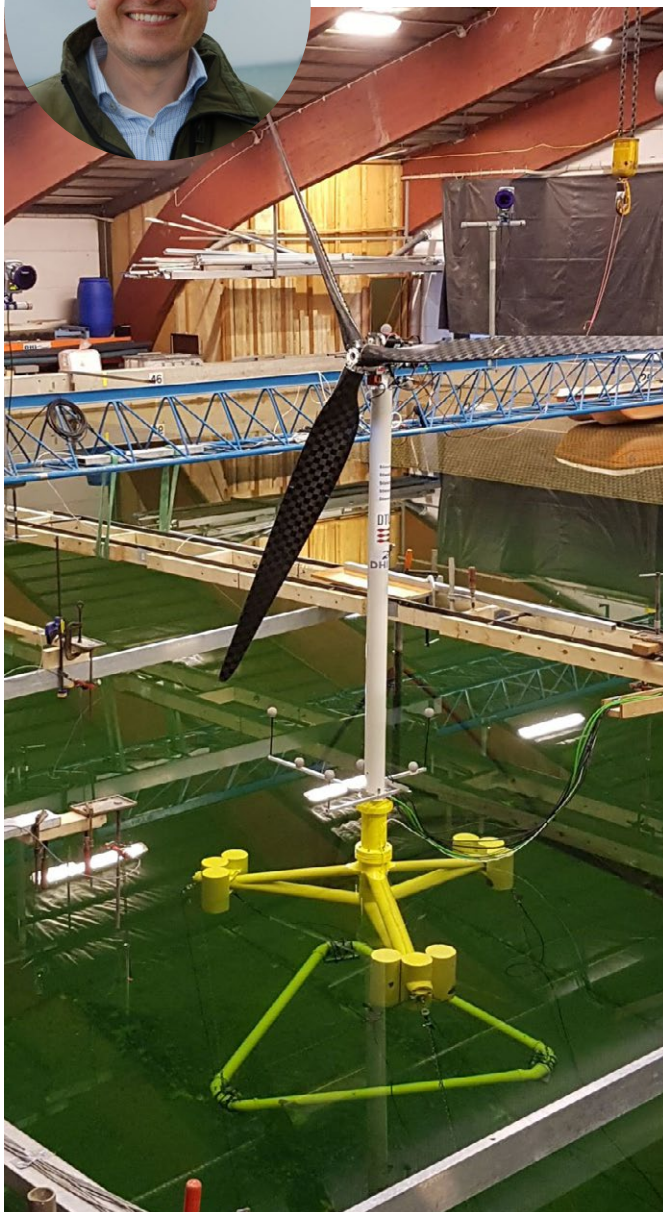
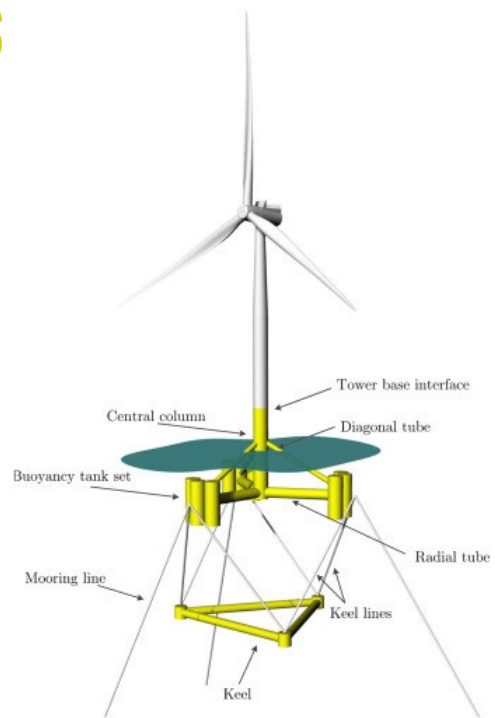
Encomara CEO Raymond Semple said that SQUID is an “agile and dynamic approach to delivering fast-turnaround turbine installation, operations and maintenance scopes, and eventual decommissioning.”

Encomara was founded by four industry veterans, each with more than 30 years of energy sector experience, including in wave, tidal, fixed, and floating offshore wind.

Ian Cobban is the chief operating officer (COO); Malcolm Bowie is the chief technology officer (CTO); Ian Donald is the company’s executive chairman; and Raymond Semple, the CEO.

DYNAMIC RESPONSE ANALYSIS OF THE TETRASPAN FLOATER IN WAVES:

EXPERIMENT AND NUMERICAL REPRODUCTION



The initial proof of concept model scale test campaign for the TetraSpar floating wind turbine substructure is presented here along with a detailed response analysis and numerical reproduction. The tests were conducted at scale 1:60 in wind and waves with the pitch-regulated DTU 10 MW wind turbine. The floater was tested in two configurations: semi-submersible and spar. The experimental setup and program is described in detail followed by system identification for natural frequencies and damping. The responses of the floater in the two configurations to hydrodynamic loading are analysed and compared. The analysis includes irregular sea states and focused wave groups at both 0° and 30° heading. The hydrodynamic damping of the floaters was quantified in decay tests, showing a clear linear and second order component. It was observed that the semi-submersible configuration had significantly larger motion response than the spar configuration in ultimate limit state wave conditions. Emphasis is placed on the mooring loads and the tensions in the support lines for the ballasted keel. The increased ballast of the spar keel led to larger loads in these support lines. Further, second- and higher-order wave forcing were observed in responses of both configurations. A numerical model based on first-order radiation-diffraction theory, second-order Newman loads and additional Morison viscous forcing is set up. The model damping is calibrated against the measurements at each sea state. It is demonstrated that after this calibration, the model is able to reproduce the floater response and tower top accelerations with good accuracy, both in the linear range and at the natural floater frequencies, with heave in the storm sea state as the exception. The dynamic tensions in the keel lines are found to depend strongly on the lines projection to the inline wave direction. Also this behaviour is reproduced accurately by the model, although with some under-prediction in one of the lines in the rated wind sea state, which is linked to differences in the experimental pre-tension for the six lines.

FLOATING WIND FARM EOLMED: BOURBON SUCCESSFULLY COMPLETES THE FIRST STAGE OF THE PROJECT IN 2023 AND ASSERTS A LEADERSHIP ROLE IN FLOATING OFFSHORE WIND



With the successful installation this autumn of a Floating Electrical Hub (FEH) off Port-la-Nouvelle (southern France), Bourbon Subsea Services teams have laid the foundation stone for the Eolmed project, a pilot floating wind farm located off Gruissan in the Mediterranean. This project will involve three wind turbines producing more than 110 million kWh/year by 2025, which is equivalent to the consumption of 50,000 inhabitants. The FEH is a floating infrastructure that will be connected to the three wind turbines on one side and the shore connection cable on the other, enabling the transportation of electricity to the power grid.

This first major step, which took over a year to prepare, mobilized about thirty BOURBON experts (engineering, project management and offshore teams) covering the design, manufacture, towing and installation of the FEH and its subsea mooring system. Towing and installation took place over a period of two months and involved the use of an Anchor Handling Tug Supply (AHTS), the "Bourbon Liberty 222", equipped with a BOURBON remotely operated vehicles.

The Eolmed project, led by the renewable energy company QAIR, is one of the first floating wind farm projects in the Mediterranean. Its aims is both to validate the technical reliability and business model of such an installation and to contribute to the creation of an offshore wind energy industry in the Occitanie and PACA regions (South of France).

Stephan Midenet, CEO of Bourbon Subsea Services: "Contributing to the success of the Eolmed project is a one-off opportunity for BOURBON, leader in the installation of floating wind farms, to reaffirm its commitment to participate in the growth of the renewable energy industry. The project also demonstrates our ability to provide our energy clients with turnkey services mobilizing all the skills and assets of the group in EPCI mode, from the engineering phase to offshore installation. We are now focused on preparing the second stage of this project in which BOURBON will install the field's three wind turbines, in 2025, and connect them to the electricity grid. "

SOFEC OBTAINS APPROVAL IN PRINCIPLE FROM ABS FOR ITS ELECTRIC CHARGING BUOY

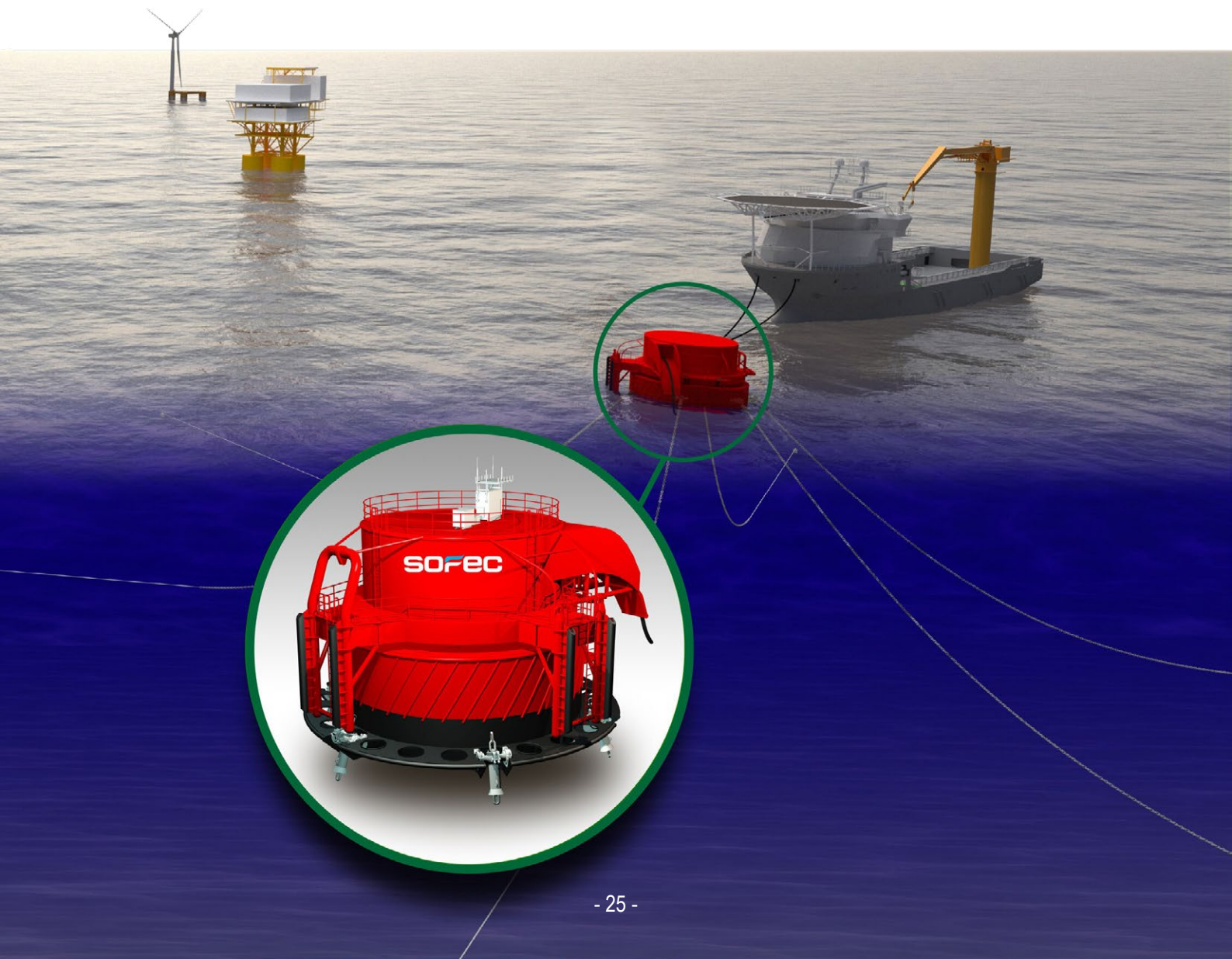
MODEC, Inc. has announced that SOFEC Inc, a MODEC Group company, has been awarded an Approval in Principle (“AiP”) by the American Bureau of Shipping (“ABS”) for its Electric Charging Buoy.

A global effort to reduce carbon emissions and pollution has led to the review of trends in the marine industry. One area of interest is expanding the use of electric shore power and renewable energy as fuel sources. Vessels at sea, or in harbor that are not quayside, are not typically afforded the benefit of shore electric power, which allows the vessel to switch off on-

board fossil fuel engines or battery systems. Additionally, in the near future, same as the Electric Vehicles (EVs), offshore vessels like tugboats, Crew Transfer Vessels (CTVs), Service Operation Vessels (SOVs), among others will be full electric, therefore the need of offshore electric charging stations.

As a part of SOFEC’s commitment to the Energy Transition and Renewable Energy, we are pleased to announce that ABS has awarded the newly developed Electric Charging Buoy an AiP.

SOFEC has adopted its experience of more than 50 years in the design of Marine Terminals and Mooring Systems to address the need for offshore power transfer. Traditional SOFEC Catenary Anchor Leg Mooring (CALM) buoy designs have integrated electrical power cable management solutions that allow vessel(s) mooring while utilizing externally supplied power. By using this proven concept, SOFEC can leverage its buoy designs and modify them to accommodate offshore electric power transfer from seaports or offshore wind farms substations to Electric Vessels. Earlier this year, SOFEC announced the award on an AiP from DNV for our Refrigerated Ammonia Jetty-less Transfer Systems. This shows SOFEC’s commitment to a cleaner and better planet.





BUOYANT PRODUCTION TECHNOLOGIES AND PETRONAS TO JOINTLY DEVELOP NEW TECHNOLOGY TO UNLOCK CHALLENGING SUBSEA TIEBACKS

Buoyant Production Technologies Ltd., (BPT), a subsidiary of Crondall Energy Ltd., and Petronas Research Sdn Bhd have together embarked on a Joint Industry Project (JIP) to qualify new Floating NUI technology for deployment on offshore projects.

The technology qualification process will allow unmanned floaters to be deployed offshore to both power and control subsea developments without the requirement for a long-distance static umbilical. This will transform the feasibility of longer distance oil and gas tieback projects and has the potential to significantly improve project economics and reduce overall project emissions.

BPT and Petronas have jointly developed the specification and qualification objectives for the demonstrator project. The engineering phase commenced in the summer of 2023 and the parties expect to commence fabrication in Q1 2024. The small payload demonstrator unit will be installed at the FABTEST site offshore Falmouth harbour in the UK, in Q4 2024, followed by a comprehensive 12-month testing programme. The testing phase will demonstrate the performance of the floater and

ability to remotely monitor and control this un-manned floating facility in a representative ocean environment. The project and technology qualification programme will be independently verified by a leading Classification Society.

BPT and Petronas are now keen to invite other interested parties to join the JIP.

Buoyant Production Technologies Ltd. Managing Director , Duncan Peace, commented “We are delighted to be working together with Petronas to bring this technology to market. The combined expertise and resources of Petronas and BPT will ensure that this technology will deliver significant improvements in the economics of long-distance tieback projects both for current hydrocarbon developments, and future CO2 sequestration projects. We hope that this JIP will mark the start of a long and fruitful collaboration between Petronas and BPT as we work together to deliver the benefits of this technology”.

A representative from Petronas said, “We look forward for joint development and qualification of this technology to unlock our domestic and international deep-water tie-backs”.

ECOWENDE CONTRACTS VAN OORD TO BUILD MOST ECOLOGICAL WIND FARM YET

Following the announcement about their collaboration, Ecowende is pleased to confirm that Van Oord has been contracted for the construction of the offshore wind farm Hollandse Kust (west) lot VI. Ecowende, a joint venture of Shell and Eneco, is determined to contribute to a sustainable future for offshore wind that positively contributes to the North Sea's ecology.

As Ecowende's contractor, Van Oord will be responsible for transporting and installing the foundations. Van Oord will also lay, connect and bury the cables between the wind turbines. Finally, Van Oord will be handling the transportation and installation of the wind turbines at sea.

Society needs offshore wind projects to meet its renewable energy targets

Building wind farms in harmony with nature is an important condition for eventually achieving these targets. Besides reducing the negative impact of an offshore wind farm, it is also necessary to implement ecological measures that can contribute to the development of wind farms with a net-positive impact. Ecowende and Van Oord will collaborate on implementing various innovations, large-scale mitigations and stimulating ecological measures. In addition, the parties will join forces in various feasibility studies and solution developments.

Noise mitigation

Van Oord will deploy its brand-new offshore installation vessel Boreas, currently being built, for the transport and installation of the foundations and turbines. To minimise the noise of the construction of the wind farm, Van Oord will deploy an alternative installation method for the foundations. A vibro hammer, using vibrations will drive the monopiles to their required depths. This will be the first large scale implementation of this innovative technique at a Dutch offshore wind farm. Van Oord's cable laying vessel Nexus will be deployed for the installation of the connecting inter-array cables between the wind turbines.

Eco-friendly scour protection

The installation of scour protection is required to avoid the effects of erosion. This is achieved by high precision rock installation around the foundations. Van Oord has advised Ecowende on nature enhancing components in the design of the scour protection to help stimulate a diverse habitat for marine life. One of Van Oord's flexible fallpipe vessels will be deployed to accurately and efficiently install the eco-friendly scour protection.



WINDWARD OFFSHORE EXPANDS OFFSHORE WIND ACTIVITIES WITH TWO ADDITIONAL STATE-OF-THE-ART CSOV VESSELS

Hamburg, Munich, and Athens, 23rd January 2024 – Windward Offshore has exercised options, which were contained in the contract signed with Vard in October 2023, for the design and construction of two hybrid Commissioning Service Operation Vessels (CSOVs). As part of the order, the number of units ordered from VARD rises to four.

This order marks another significant milestone for Windward Offshore in advancing its commitment to deliver comprehensive offshore wind solutions. This strategic move not only underscores Windward's dedication to meeting the substantial global demand for offshore wind energy and associated infrastructure but also serves as a testament to the demonstrated expertise and successful track record of VARD in the construction of offshore wind vessels.

The founding partners driving Windward Offshore's innovative venture are SeaReenergy Offshore, Blue Star Group, Diana Shipping Inc. and SeraVerse. Together, they are united by a shared vision of pioneering excellence in the offshore wind sector.

“Windward Offshore is pleased to announce the execution of the Options for two further VARD 4 19 CSOVs, expanding our initial two vessel order to four vessels, and continuing our trusted relationship with VARD. All of our Vessels are designed to be equipped with the latest eco-friendly technologies with

the goal of minimizing environmental impact and offering the highest safety standards to ensure safe and sustainable offshore operations.”, says Benjamin Vordemfelde – Managing Director Windward Offshore.

“We believe CSOV vessels will play a crucial role in the energy transition and we are looking forward to offer our clients a comprehensive offshore wind service platform which combines a unique blend of the extensive maritime and offshore wind industry expertise by our partners”, says Christoph Geck-Schlich – Managing Director Windward Offshore.

With the four vessels on order, Windward Offshore is expanding its footprint in the industry. The first vessel is expected to be delivered in the second half of 2025, with the other three vessels joining the fleet in the course of 2026. With these modern vessels, Windward Offshore will support energy providers globally in constructing, commissioning, and maintaining offshore wind parks.

The initial announcement of the joint venture has already been well received by a variety of customers across different regions, demonstrating the strong market demand for Windward Offshore's services. Additionally, also governments worldwide reaffirmed the need for offshore wind energy as an integral element of the energy transition at the world climate conference in 2023.





A UK FIRST! The Hybrid CTV, HST MILLIE is IMO Tier 3 compliant with SCR's (Selective Catalytic Reduction) to reduce NOX & SOX.

She was designed by Chartwell Marine Ltd for High Speed Transfers Ltd and is now completing final sea trials ahead of her handover.



**HUGHES
SUBSEA**
an O&G Group company

DIVING SERVICES ARE AT THE VERY CORE OF OUR BUSINESS, AND WE PRIDE OURSELVES ON PROVIDING EXPERIENCED, TIME-SERVED AND COMPETENT DIVERS TO PERFORM ALL OUR SUBSEA ACTIVITIES IN A PRODUCTIVE AND SAFE MANNER

The core management team at Hughes Subsea have a background within the diving industry, and as such have a solid understanding of the challenges posed by the marine environment. Hughes Subsea Services Ltd is a registered diving contractor under the UK Health and Safety Executive (HSE). We are also fully accredited members of the Association of Diving Contractors (ADC) and comply with all issued International Marine Contractors Association (IMCA) guidelines.

Unrivalled subsea knowledge and expertise

We combine our extensive experience in the Oil and Gas, Civil Engineering, Marine Renewable Energy and Power Generation Industries with the latest in subsea technology. This allows us to provide teams with unrivalled knowledge and know-how, for as long as the project requires.

We deliver a comprehensive range of diving services to our clients, including:

- Subsea Cable Installation, Deburial, Repair and Burial
- Subsea Cathodic Protection Design and Installation
- Subsea Mattress Installation and Relocation
- Asset and Scour Protection
- Salvage Operations
- Subsea IRM services
- Civil Engineering
- Demolition
- Asset Inspection and NDT
- Subsea Coded Welding to ASME 9 standards





SUBSEA ROBOTICS SERVICES

PETRODIVE GROUP PLANS TO DEVELOP ITS ROV CAPABILITIES

Dubai-based subsea services provider PETRODIVE has recently acquired 5 ROVs.

The acquisition of these ROVs adds to PETRODIVE's capacity to undertake the broadest range of ROV requirements from O&G and Maritime Contractors. This includes high-quality survey work, inspection, repair, and maintenance (IRM), and heavy intervention tooling down to 1,000 meters.

PETRODIVE Teams are experts in providing the most effective solutions that can prolong the life of subsea assets.

PETRODIVE invested \$5 million in its ROV fleet. The Company established its ROV Division in 2021, initially focusing on providing experienced personnel at all levels in observation and work class vehicles. It operates both in Africa and internationally.

It currently owns 3 ROVs with observation classes and 2 ROVs with work classes and is planning to acquire more ROVs in the future.

OBSERVATION CLASSES AND WORK CLASSES

ROVs are controlled by a ROV operator typically on a surface vessel, using a joystick like you would play a video game. A group of cables, or tethers, connects the ROV to the ship, sending electrical signals back and forth between the operator and the vehicle. They use external sensors that are mounted on the vehicle to measure things like conductivity, temperature, and depth.

Observation Class

PETRODIVE uses observation class ROVs to inspect infrastructure and the underwater area to help plan future projects for Oil and Gas Contractors. These ROVs are equipped with high-end cameras and lightweight sonar systems to avoid missing any small details like cracks. A manipulator (arms and hands) on one of these vehicles tends to be small with limited functionality (1-3 functions typically), and their thrusters can be either vectored or standard.

Work Class

PETRODIVE also uses Work class ROVs. They are used for ocean floor exploration, deep depths that divers cannot reach, and heavier construction tasks that take more time on the bottom than divers can spare. Due to their FO-equipped umbilicals, they can carry additional sensors and have multiple capabilities that allow for additional tools. Their sensor and sonar arrays can image large areas or provide minute details to specific structures. Most are equipped with a pair of manipulators—one for heavy lifting and grasping and the other with up to 7 individual functions that can be nearly as nimble as the human hand! The thrusters on these ROVs are vectored and very powerful, producing from 50 to over 200hp.

The Panther is a great alternative to heavier hydraulic vehicles, particularly where deck space is at a premium. These ROVs set the standard for electric light work class vehicles operating across a broad spectrum of subsea energy projects.

INNOVATIVE ANODE CAGE INSTALLATION TOOL



EAGER.ONE

One of the important steps during the construction of an offshore windfarm is the installation of anode cages after the monopiles have been installed. To make this process as safe and efficient as possible, a good and reliable anode cage installation tool is essential.

FULL PROJECT SUPPORT

After a request from DEME Offshore, Eager.one has developed an innovative Anode Cage Installation Tool (ACIT) with an updated design, and increased capacity. The tool has been developed for Anode Cages with a weight of 13 tons and diameter of 9.800 mm. Just like every design & construct project, this project was also delivered with complete project support, from initial design, to fabrication, testing and final delivery and support on-site.



HEEREMA INSTALLS TOP SECTION OF NEW NOISE MITIGATION SYSTEM

The top section of the Template-Noise Mitigation System (NMS-T) for installing monopiles was lifted on at Heerema Fabrication Group's location in Vlissingen. The NMS-T-10000 will be able to mitigate approximately 15 dB of waterborne noise.

The enormous piece of equipment was constructed at Heerema Marine Contractors and developed in close cooperation with IQIP. The NMS-T-10000 will be the largest noise mitigation system in the world. Once completed, it will be as high and wide as the Arc de Triomphe in Paris. It measures 50 meters high, has a template base of 45 meters wide, a total weight of

little under 2500 tonnes, and is capable of handling monopiles with a diameter up to 10.0 metres.

In addition, the system offers 15 dB driving noise reduction, levelling up to 3 degrees bottom slope and has capabilities to be used in up to 42 metres in water depth, making it is an essential tool for future installations of offshore wind.

Also read: Shipbuilder Royal IHC sells IQIP to HAL

Double-wall steel screen

The NMS-T-10000 is derived from its successful NMS-8000 and NMS-8800 predecessors, which are recognised as the best-in-class underwater noise mitigation technology. The basic concept of IQIP's noise mitigation systems is to create barriers between different media and materials.

The NMS-T-10000 is, simply put, a double-wall steel screen featuring an air-filled annulus between the inner and outer screens and a multi-level and multi-size bubble injection system. This efficient solution mitigates up to 98-100 per cent of the waterborne noise.

The next steps are to commission and test all T-NMS systems to be ready for the first project, which will be foundations for the EnBW He Dreht offshore wind farm. The wind farm is located around 90 kilometers northwest of the island of Borkum and 110 kilometers west of Helgoland. The 64 turbines planned, with an installed output of 960 MW, are to be connected to the grid by the end of 2025.





FASTRO is the smart modular lifting system that empowers contractors to efficiently perform any heavy lift operations with optimal efficiency, without wasting time, money, manpower, or materials.

HEAVY LIFTING WITH COMBILIFT



The launch of the Combi-LC Blade marks Combilift's official move into the offshore wind sector and is the culmination of a close collaboration with Siemens Gamesa. But the offshore wind sector is more than just blades : steel towers, hubs, nacelles, rotors, floating structures... Combilift's array of "heavy lifters" includes high-capacity C-Series multidirectional trucks, Mobile Gantries (Combi-MG) and Straddle Carriers (Combi-SC), with a chassis lifting capability of up to 150t. Moving extremely overloaded, long and heavy loads is not a problem for these "big boys" – not to forget Combilift's core principles are uppermost on the agenda: handling loads efficiently and safely both indoors and outdoors.

It all started in 1998 with a concept that has revolutionised the materials handling sector: a multidirectional 3-wheel, 4-tonne capacity forklift truck for handling long loads safely; and for the last 25 years, Irish-based Combilift has continued to lead the field in "lifting innovation". Combilift's ever-growing range has broadened greatly since the first-ever C-Series was built, culminating in Combilift's latest addition, the Combi-LC Blade mover, which allows for the movement of wind turbine blades – some as long as 115m and weighing 70t.

Danish manufacturer Andresen Towers was an early convert to the Combi-SC when it was looking for a method of handling its next much larger generation of shell towers for wind turbines. Crates of these 14m long, 3.3m diameter elements can now be easily moved in and around the production facilities and

loaded onto HGVs in the yard without the need for a crane. This enabled the company to achieve a competitive price point for its customers as a result of better logistics, transportation and storage.

Combilift's range of heavy lifting equipment is not limited to the wind industry. They are being utilised in other sectors such as structural steel, modular construction and concrete, to name a few. An example of the latter is German concrete specialist Tenwinkel GmbH & Co. KG. They can manufacture and handle ever heavier finished products that its customers such as Liebherr are demanding thanks to a 30t capacity Combi MG. Replacing a combination of counterbalance truck and crane, its Combi-MG is a very flexible and mobile solution for lifting high-density moulded parts, technical components and counterweights around the premises and loading them for dispatch. All Combi-SCs and Combi-MGs can be built to dimensions to suit specific applications, and fitted with a wide range of lifting accessories and this was the case with Tenwinkel's machine. Its width and height were tailored to ensure easy access to the production area through doorways while the telescopic facility enables it to be used for positioning manufacturing tools.

So, if you think you have a problem handling awkward or extra-large products, share it with Combilift – it will not only be a load off your mind but could open up new possibilities for your business.

RIDGEWAY

ROCK BAGS
100% RECYCLED

INNOVATIVE SUBSEA ASSET PROTECTION

Introduced into the U.K. and Europe by Ridgeway and Sumitomo in 2009, We have been busy listening, learning and promoting the offshore applications and benefits of the Kwoya Filter Units or more commonly referred to by the offshore and marine markets as “Rockbags”.

Designed originally as an effective means of “filter layer” scour protection for subsea structures in dynamic seabeds and challenging velocities, the Kwoya Filter Unit Rockbag has evolved to become a significant technical product and proven a safe, 100% recycled clean engineering solution with various innovative options on size and product specifications.

The knowledge base and expertise learned from severe Japanese weather conditions has expanded the use of the Rockbags over many decades within civil engineering applications also marine infrastructure protection of cables, pipelines, and seabed correction. Patent protected for various applications (Patent Nos EP2341592, EP2348215 and EP2354535, the Rockbags, used in combination with other traditional methods of cable and scour protection, are adding value to the solutions toolkit of the marine contractors.

Ridgeway have been working in collaboration with clients to add value on providing tools for stability calculations, CFD, excessive performance testing and modelling also trusted environmental subsea performance during their lifetime and importantly safe decommissioning.



Once installed the filter unit Rockbags create their own mini ecosystem encouraging the regeneration of aquaculture environments, this aspect has become an important aspect for developers adding real value environmental engineering and sustainability in their subsea solutions.

In addition to this, Ridgeway have established a comprehensive geographical stock network of fast response capability for filled Rockbags under hook at ports throughout Europe utilising local labour and logistics.

Ridgeway have now a significant project track record for example flagship projects such as Teesside Offshore Wind Farm by EDF Energy Renewables. A world first in 2013 using Filter Unit Rockbags for scour protection on monopiles. It has also won contracts for works in Ireland at Arklow Bank, in Scotland at Beatrice, in England on Robin Rigg constructed by German provider E.ON, Gwynt y Môr wind farm in Wales (RWE Renewables UK) and other E.ON's schemes such as Humber Gateway and Rampion. For more information please visit: www.rockbags.com

RIDGEWAY

Offshore Wind Farm Project	Country	Owner	Protection	Year
Sherringham Shoal	UK	Equinor	Cable Underpinning	2010
Nordsee Ost	Germany	RWE	Jacket scour protection	2012
Arklow Bank	Ireland	GE Energy	J-tube cable support	2012
Teesside	UK	EDF	Monopile scour protection	2013
Westermost Rough	UK	Orsted	Cable protection	2014
Karehamn	Sweden	E.on	Cable protection	2014
Gwynt y Mor	UK	RWE	CPS Stabilisation	2014
Humber Gateway	UK	E.on	Cable protection	2014
Luchterduinen	Netherlands	ENCO	Freespan correction	2015
Dolwin 2	Germany	Tennet	Cable protection at OSS	2015
Dudgeon	UK	Equinor	Cable protection	2016
Wavehub	UK	Wavehub	Cable protection	2016
Egmond aan Zee	Netherlands	Shell	Freespan Correction	2016
Rampion	UK	E.on	Cable protection	2016
Robin Rigg	UK	E.on	Monopile scour protection	2016
North Wind	Belgium	Parkwind	Belmouth Stabilisation	2016
Race Bank	UK	Orsted	CPS Stabilisation	2017
Beatrice	UK	SSE	Bellmouth cable support	2018
East Anglia 1	UK	Scottish Power	Cable protection	2018
Kincardine Floating	UK	Pilot Offshore	Export cable support	2018
Formosa Phase 1	Taiwan	Orsted	Monopile scour protection	2019
Wind Float Atlantic	Portugal	Repsol/EDP/ENGIE	Cable route preparation	2019
Barrow	UK	Orsted	Cable stabilisation at OSS	2019
Yunlin	Taiwan	WPD	Monopile scour protection	2020
Hornsea 1	UK	Orsted	Cable protection/support	2021
Galloper	UK	RWE	CPS Stabilisation	2021
Saint Nazaire	France	EDF	Cable protection	2021
Hollandsee Kust Zuid	Netherlands	Vattenfall	Cable crossing protection	2022
St Brieuc	France	Iberdrola	Export cable protection	2022
Arcadis Ost 1	Germany	Parkwind	Cable protection	2022





Fraunhofer
IFAM

POTENTIAL OF DRONES OFFSHORE DRONES

Wind turbines offshore have plenty of advantages, but maintaining them is challenging. So-called offshore drones can relieve the burden of impassable work such as maintenance, inspection, repair or surveying. They have been specially developed for these difficult conditions. With the "Offshore Drone Campus Cuxhaven" (ODCC for short), Fraunhofer IFAM is creating a test and development infrastructure for unmanned aerial systems for offshore use. The aim is to provide industry and the economy with a long-term planning perspective and procedural security for the regular operation of offshore UAS.



Signing a cooperation agreement between SynergyXR and Fidar Offshore Animation for the development of VR&AR technology in the offshore renewable energy industry.

SynergyXR is a powerful cloud platform that lets companies train employees, deliver maintenance and offer remote support across all XR devices without having to write a single line of code.



OFFSHORE PHOTOGRAPHER

AN IMAGE CREATION SPECIALIST WITH THE NECESSARY CERTIFICATIONS TO ACCESS MARINE SITES, TO DOCUMENT THE ACTIVITIES OF THE OIL AND GAS AND MARINE RENEWABLE ENERGY INDUSTRIES



A technician accesses a foundation / Saint Brieuc Windfarm -France – C.Beyssier

Christophe decided in 2022 to stop sailing. After 25 years commanding vessels such as harbour and coastal tugs, and having spent several years on the coast of Africa on anchor-handlers and supply vessels, he has decided to combine his 2 passions, associating the sea, the maritime industry & image.

As well as documenting your large-scale operations or the work of your teams, Christophe can help you with your communication projects. He has cameras in his bag, of course, drones, but also a fullformat camera with 4k quality.

He'll be with you for the long haul, providing you with photos,

aerial images and videos:

The images that will highlight your expertise !

To find your offshore photographer:

[linkedin.com/company/offshorechannel-photographers/](https://www.linkedin.com/company/offshorechannel-photographers/)

Christophe Beyssier

Photographer – France

www.photographe-offshore.com

www.visualprod-offshore.com

Whatsapp: +33(0)6 11 97 56 50

To work with me: cbeyssier.photography@gmail.com



Jochem Tacx
Cesare Meinardi

An aerial photograph of a large offshore supply vessel, likely a jack-up vessel, positioned in the ocean. The vessel is white with blue and orange accents. A prominent red lattice crane is mounted on the deck, extending upwards. The vessel's deck is cluttered with various pieces of equipment, including pipes, containers, and structural elements. The water is a deep teal color, and the sky is a clear, bright blue. The vessel is oriented vertically in the frame, with its bow at the bottom.

BUILDING AN OFFSHORE WIND FARM

OPERATIONAL GUIDE

Second edition





OSCILLA POWER SUCCESSFULLY LAUNCHES DEMONSTRATION SCALE TRITON™ WAVE ENERGY CONVERTER (WEC) ON MAINE COAST

The focus of the test is to determine load capacity and survivability of full-scale (1 MW) WEC in actual ocean environment

Oscilla Power's Wave Energy Converter Tested Off the Coast of Maine CASTINE, Maine, Dec. 05, 2023 (GLOBE NEWSWIRE) -- Wave energy technology developer Oscilla Power, the University of Maine's Advanced Structures & Composites Center (ASCC) and the Maine Maritime Academy successfully deployed a 1/6 scale prototype of Oscilla's 1 MW Triton™ wave energy converter (WEC) in Castine Harbor. The goal of this project is to confirm the design and performance of Triton in a real-world operating environment, helping to inform the ongoing engineering design of Oscilla's full-scale, 1 MW Triton WEC in 2024.

Due to the unique wave conditions in Castine the 1/6 scaled unit will operate in the same manner as a full-scale unit during this 12-week test. Winter wave conditions in Castine are approximately 1/6 the size of waves experienced on the U.S. West Coast, and therefore provide an ideal representative ocean environment to test and evaluate the scaled Triton system.

A key goal of this testing is to be able demonstrate the ability of the WEC to survive extreme weather events through the use of a unique submerging ability which will enable the Triton to withstand even the harshest wave events. The testing will also be used to enable Oscilla to accurately predict the power that the full-scale system will generate in different wave conditions.

"While we have excellent design and computer-driven simulations, there is no substitute for running the unit through its paces in a real operating environment," said Tim Mundon, Ph.D., Chief Technology Officer for Oscilla Power. "Thanks to the partnership with Maine Maritime Academy and the University of Maine, we're able to complete this testing to validate our assumptions and numerical models to ensure our commercial production unit will perform as designed. This is a critical milestone in the design."





NOVIOCEAN HYBRID ENERGY CONVERTER

NoviOcean 1 MW Hybrid Wave, Wind & Solar Energy converter is set to change the renewable energy offshore landscape.

Easy to Produce, Install and Maintain

- Simple Well Proven Parts
- Modular Design
- High Survivability


Environment

- Low Visual and Audible Signature
- Low Environmental Footprint

Cost Efficient

- Weight to Power : 1/2 vs Offshore Wind
- LCOE 1/3 vs start of Wind & Solar
- Power To Weight Ratio : 2-50 vs Wave
- Energy Competitors





TIDAL ENERGY:
A RENEWABLE ENERGY SOURCE
ENTIRELY PREDICTABLE



IFREMER AND HYDROQUEST SET UP A JOINT LABORATORY FOR THE DEVELOPMENT OF OFFSHORE TIDAL TURBINES

On January 10 and 11, 2024, Ifremer and HydroQuest are launching the joint VERTI-Lab laboratory, to create specific analysis tools and support for the design of tidal systems and facilitate the development of commercial farms.

Marine tidal power is making great strides in France. This completely predictable renewable energy source offers a strategic complement to the energy mix. Supported by the President of the Republic during the Maritime Economy Conference in November 2023 in Nantes, the tidal energy sector is proving very promising in the region.

In this context, Ifremer and HydroQuest are today launching VERTI-Lab, a joint laboratory supported by the National Research Agency, to develop analysis tools and support for the design of tidal turbines adapted to marine constraints. . This project is an extension of a collaboration initiated in 2015. The partners are counting on the complementarity of their skills to jointly remove technological obstacles, by focusing on:

- experimental and numerical modeling to study and optimize the behavior of vertical axis tidal turbines;
- the study of the influence of turbulence, wake effects and sea states on the quantity of energy produced and the wear of tidal turbines;
- improving estimates of operating conditions;
- the development of bottom stations suitable for monitoring the operation of tidal farms and evaluating interactions with ecosystems.



HYDR@WING



HYDROWING CREATES UNIQUE NEW BARGE TO SERVICE ITS TIDAL ENERGY TECHNOLOGY

HydroWing has designed an innovative new barge which will help drive down the cost of installation and maintenance for its patented tidal stream array technology.

HydroWing is designed to be a cost-effective and scalable solution to tidal stream energy generation and was the largest tidal stream project in Wales to be successful in the UK government's latest Contracts for Difference round, having been awarded a 10MW project at the Morlais tidal energy site in Anglesey.

Commercialisation of the tidal energy sector has so far been held back by high operations and maintenance costs. HydroWing's next generation technology addresses that challenge head on. Its HydroWing technology offers a modular, reliable solution, based on its unique patented design. The wing system streamlines operations and maintenance by allowing for removal of sets of tidal energy turbines without the need to remove or work on the foundations. The new Quad Hull Barge is the latest innovation to the HydroWing system, which further increases productivity and drives down costs.

Richard Parkinson, MD of Inyanga Marine Energy Group, which is the parent company for HydroWing, said: "Deployment, recovery, and operations and maintenance are large factors in determining the levelized cost of electricity. However, offshore construction vessel availability is very weak with expensive day rates. This means that the cost of planned and unplanned offshore operations is very high. HydroWing's new Quad Hull Barge has been specifically designed to tackle this issue, driving down costs and ensuring the turbines can be effectively

maintained at low cost and with reduced downtime.

"By using four hulls connected by crossbeams and arch support beams, the limit to load width is dramatically increased. Where commercial vessels would typically need to place the load onto the deck with little to no overhang of the load, the Quad Hull Barge locks the load after lifting to the arch. This reduces offshore handling and makes the operation much safer. It means that the width of the load can be independent of the vessel width.

"Our new Quad Hull Barge represents a major leap forward for the sector. The design ticks all the important boxes for offshore operators. It is modular, so it can be transported by road and assembled at site. As it is modular, it can also easily be scaled up for larger turbines. The four pontoons are 25 tonnes each and can be transported by road, which reduces manufacturing costs. It is low drag and easier to tow and can therefore be handled by small, locally available tugs. All of these factors will help to lower the cost of each intervention. In addition, it is on permanent standby and can be deployed quickly, which will help operators to reduce production downtime.

"The Quad Hull Barge will mean that our HydroWing tidal energy arrays can be serviced by existing port infrastructure, rather than requiring major new investment, which is one of the keys to ensuring that the sector achieves profitable growth into the future. We believe our HydroWing technology will unlock the commercial potential of tidal energy worldwide."

The company has filed a patent application to protect its unique Quad Hull Barge design.

Minesto

MINESTO'S DRAGON 12 READY TO POWER HOMES

Minesto has carried out the Launch and Recovery System (LARS) method for the 1.2 MW, 25-ton Dragon 12 tidal energy kite in Vestmannastrandir, Faroe Islands.

According to Minesto, the operations developed for Dragon 4, which has a capacity of 100 kW and weighs 2.5 tons, were equally effective with the megawatt-scale kite utilizing the same small work vessel.

The Dragon 12 is ten times heavier and three times bigger than the Dragon 4, with a longer tether, and is installed in larger water depths.

“By efficiently launching and recovering the Dragon 12 for the first time, we have now verified the critical Launch and Recovery System. It is satisfactory that the smaller kite operations are proven effective also with large-scale kites,” said Martin Edlund, CEO of Minesto.

“A complete run-through of the launch and recovery of the Dragon 12 powerplant over the last 24h has successfully verified the core marine operations of our kite-based power plants. This is a truly unique procedure at the core of our competitive LCOE-levels”

The LARS process was finished in less than two hours.

The ongoing commissioning process of Dragon 12 at the site is progressing toward achieving electricity production objectives. Simultaneously, operations of the smaller Dragon 4 power plants continue to function.



SUCCESSFUL COMPLETION PHASE 1 OF GOTO ISLANDS PILOT

The AR500 tidal turbine has successfully completed Phase 1 of the Goto Islands pilot project and was recovered from the Naru Strait in December 2023.

This phase concluded 12-months of generation with an impressive 97% availability. Built upon the success of the pilot project, the turbine is now ready to be locally upgraded and redeployed in Q1 2025.

The Proteus Marine Renewables Operations team, coupled with local support from Toyo Construction, Goto Transportation and Shibuya Diving, executed the successful recovery in 2 days.

The recovery operations included the retrieval of the export cable dry mate connector, followed by the AR500 turbine itself using Proteus bespoke in-house subsea handling equipment.

The successful recovery also marked a significant milestone as the first retrieval of a tidal turbine using a Japanese DP vessel. The 'August Explorer' was the subject of much scrutiny and analysis prior to the operations and she proved to be a versatile and capable vessel when it came to the operations.

The operations were also completed without the use of a work-class ROV. This was made possible with the use of Proteus bespoke in-house subsea handling equipment.





INYANGA MARINE ENERGY GROUP OPENS NEW BASE IN WALES TO DELIVER ITS GROUNDBREAKING TIDAL ENERGY PROJECT

Inyanga Marine Energy Group has kicked off the New Year by opening a new office in Wales. The new office will support the development of their innovative HydroWing tidal stream energy project at Morlais on Anglesey.

Inyanga has recently been awarded a contract for a 10 MW tidal stream energy project at Morlais, through the latest round of the UK Government's 'Contracts for Difference' allocation. Morlais is the UK's largest consented tidal energy scheme and one of the largest in Europe. It is managed by the social enterprise Menter Môn.

The new office is based at M-SParc, a science park on Anglesey in Wales, owned by Bangor University. The office will be led by Commercial Manager Osian Roberts, who was born and raised on Anglesey and has considerable international experience in the offshore renewable energy sector. He will lead a team to be based at M-SParc, creating significant new employment in the region.

Inyanga Marine Energy Group CEO Richard Parkinson says: "Our vision is to become the world leader in tidal array technology. Our project at Morlais will be a key step on this journey and opening the new office in Wales is an important milestone for us.

"Commercialisation of tidal energy has so far been held back by high operations and maintenance costs. Our HydroWing technology meets that challenge head on. We believe it will

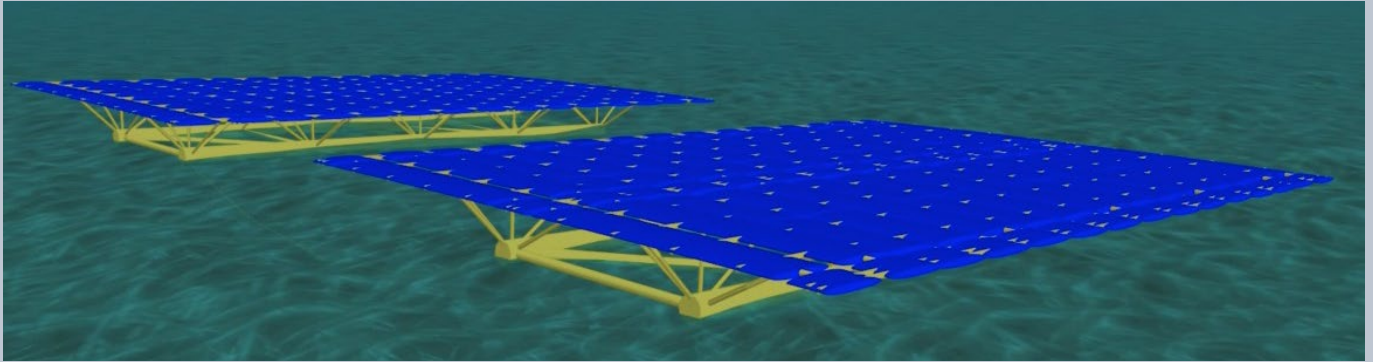
help unlock the commercial viability of tidal energy around the world, offering a low cost, reliable source of renewable energy for generations to come."

HydroWing technology is based on a unique patented modular design that dramatically improves the cost-efficiency and production of tidal stream energy.

Simon Cheeseman, Sector Lead on Wave and Tidal Energy at the Offshore Renewable Energy Catapult, said: "Tidal energy is a crucial part of the mix to achieve net zero targets globally. The team at Inyanga Marine Energy Group has unrivalled experience in the sector, having deployed more than half of all tidal stream energy devices worldwide. So it is great to see their immense knowledge and experience informing the design and deployment strategy for HydroWing, a technology that is helping deliver sector innovation."

Pryderi ap Rhisiart, Managing Director of M-SParc says:

"We are excited to welcome Inyanga Marine Energy Group to M-SParc, an innovative company which will bring real benefit to the Welsh economy. The UK Government contract for their tidal stream project at Morlais is fantastic news for Wales and will strengthen the fast-growing offshore renewables sector in the region, leading to new jobs and opportunities – something we're passionate about supporting. With our strong links to Bangor University's Ocean Science department, we hope to provide links to further collaborations."



Bluenewables

THE 1MW PV-BOS PROJECT IN VALENCIA HARBOUR IS REACHING ITS FIRST MILESTONES

BlueNewables, a Spanish engineering consultancy supporting the marine energy sector, is moving forward with its floating solar demonstration project in Valencia with the first round of contacts with main suppliers finished.

BlueNewables reported on January 18 that its 1 MW PV-bos project in Valencia harbor has reached its first milestones.

The first round of contacts with the main suppliers has finished and, according to BlueNewables, the supply chain is eager to participate in the sector, with no supply bottlenecks expected.

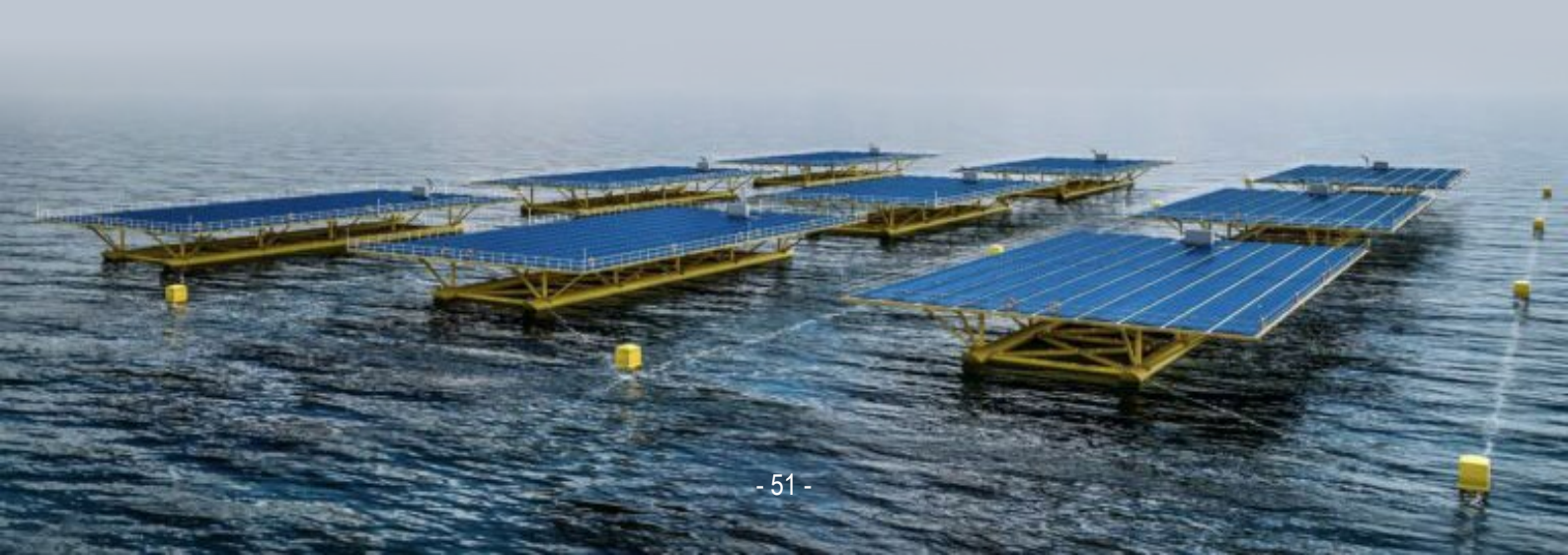
The design optimization for Valencia sea conditions is also completed and the main outcome is a remarkable steel weight

reduction and levelized cost of energy (LCOE) reduction targets are on the right path to be achieved, the company said.

In addition, the detail design stage has been initiated which will see hundreds of advanced simulations, drawings, and design reports performed over the next five months.

Construction of the project is planned to be initiated by the end of the second quarter of 2024. BlueNewables' proprietary technology PV-bos will demonstrate its reliability for two years in Valencia's waters.

The project is supported by The Institute for the Diversification and Saving of Energy (IDAE) as part of the Renmarinas program.



17 MW OFFSHORE FLOATING ENERGY ISLAND

An innovative project by WUPROHYD

A few years ago, a group of Wuprohyd engineers joined forces and the innovative project of an Ecological Offshore Power Plant Using Energy From Three Renewable Energy Sources was created.

The two basic factors for the creation of the project, as said Piotr Cieślak, the President of the company, are:

- securing orders for Polish production yards;
- introduction of an innovative solution for a water turbine operating by using the circulation of water molecules to the market.

The turbine and energy island projects have been patented and constitute a huge innovation on the offshore energy market, and thanks to the use of three renewable energy sources in one place, they meet the Green Deal. The sun, wind, and waves are the three energy sources of the Floating Isle of Wuprohyd.

In the Baltic Sea the average parameters of deepwater wave are one of the lowest in the world, and the energy is 10kW / m of wave crest width. Thus, on a 400 km section of the Polish coast, the energy contained in sea waves amounts to approx. 4000 MW. Engineers found an effective solution and used these harsh conditions to generate energy.



ARE SOLAR PVT EVACUATED TUBES THE FUTURE OF THE OFFSHORE FLOATING SOLAR PANELS?



Matthias Herberich



Farshid Ebrahimi

Looking to the future, we need to be open to new ways to we can make our contribution to climate protection effectively.

In the currently available PV floating systems, they use framed standard photovoltaic modules and these are today more than 2 sqm and flat. But the size of the modules increases more and more with increasing performance. In the countryside this may be an advantage, but on the water, this is a big disadvantage. The static load caused by snow and above all wind and high waves are a major risk factor. The load on the material is therefore very high.

“Our innovative TUBE MODULE has addressed this problem”, explains the developer of this tube Matthias Herberich.

The round shape reduces the possible snow load. Wind and

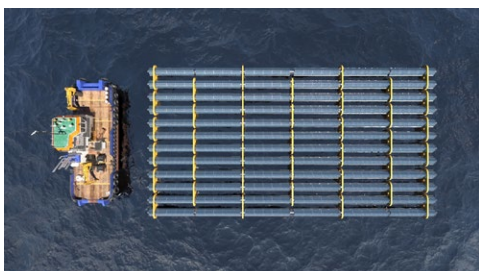
waves have less attack surface. Thus, many photovoltaic projects can from a static point of view with classic modules on land and on water realized only at high cost.

Not to forget the design, because the power generation by Photovoltaics can also look good.

The prototype in the field of floating PV has already been successfully tested in practice. The next steps are optimization of size and performance and after this the test in wind and wave tunnel for the preparation of pilot plants at sea and on land.

Founding of a start-up. Investors are welcome.

Contact: entwicklungsbuero-herberich@email.de



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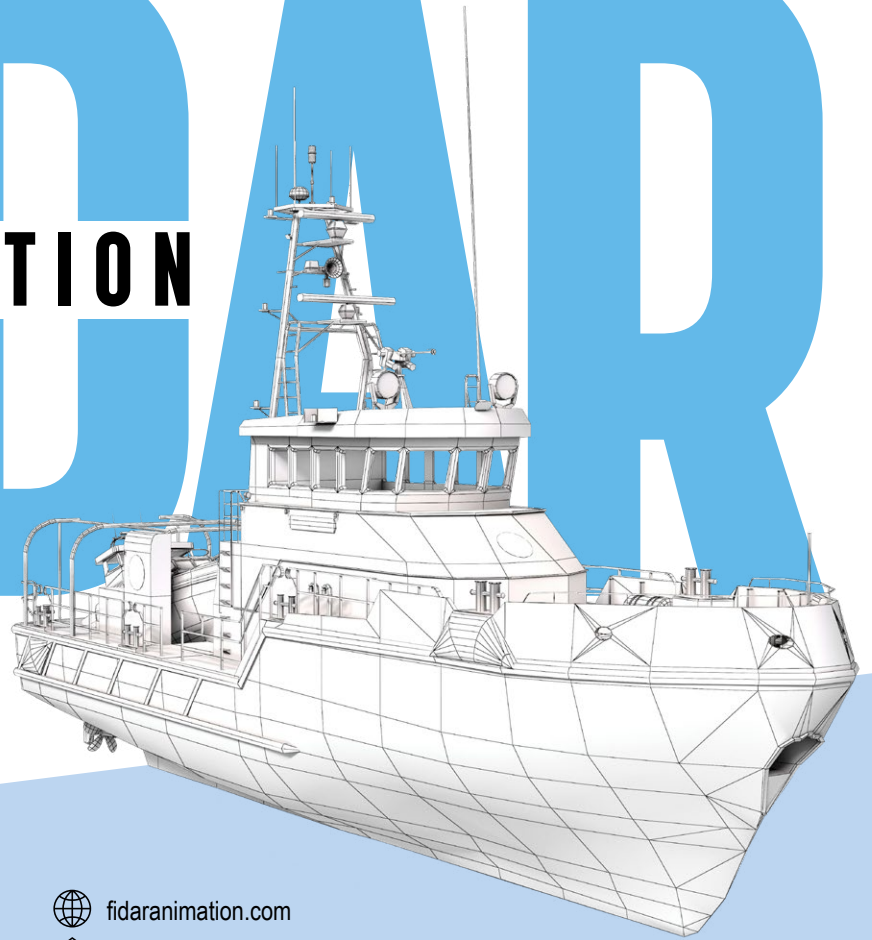


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