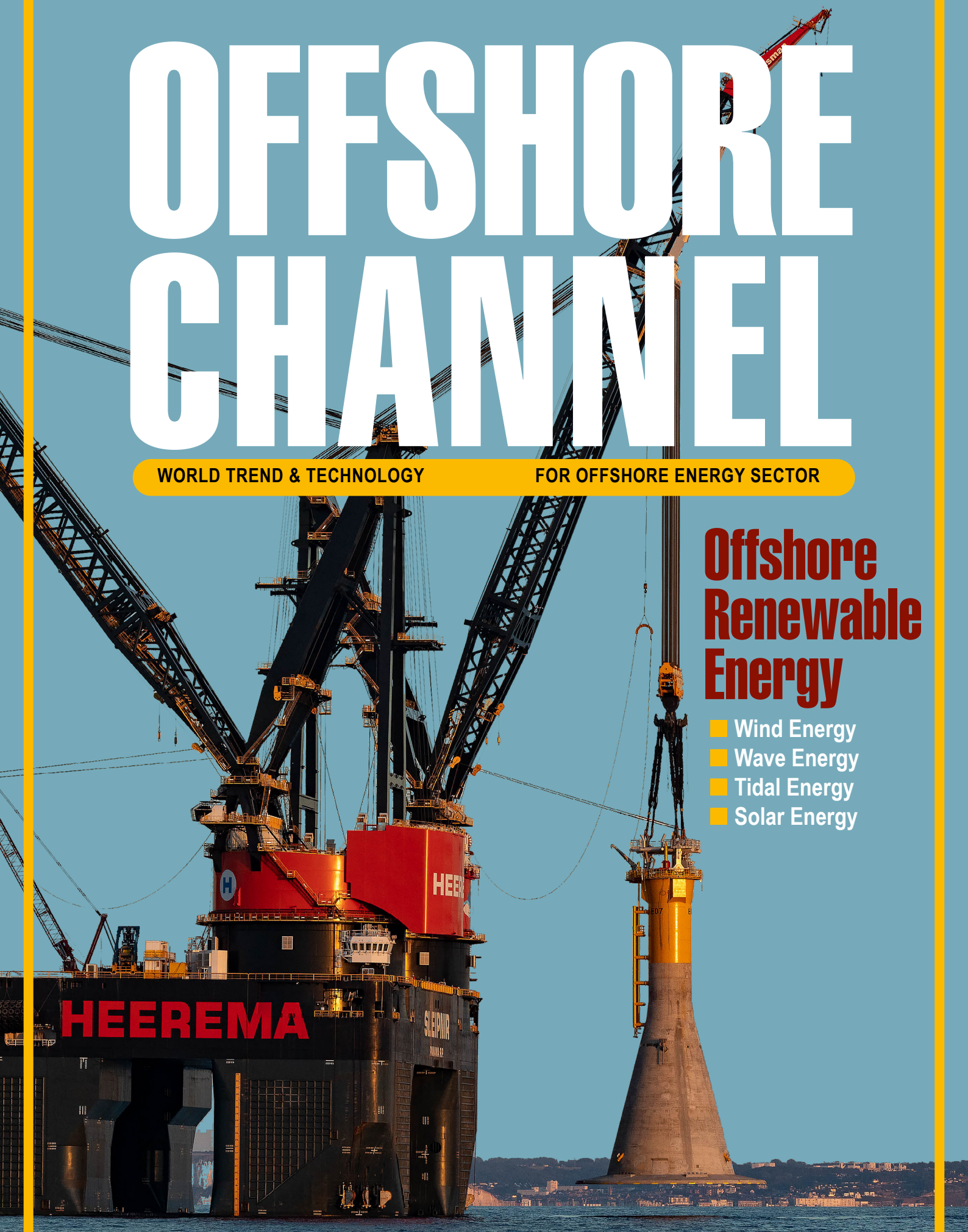
OFFSHORE CHANNEL

WORLD TREND & TECHNOLOGY FOR OFFSHORE ENERGY SECTOR



Offshore Renewable Energy

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

Jul & Aug 2022

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.

TENNET'S DOLWIN KAPPA PLATFORM ARRIVES IN GERMAN NORTH SEA

TenneT's DolWin kappa has now arrived in the German North Sea ready for the 900MW offshore converter station to be installed next to DolWin beta.

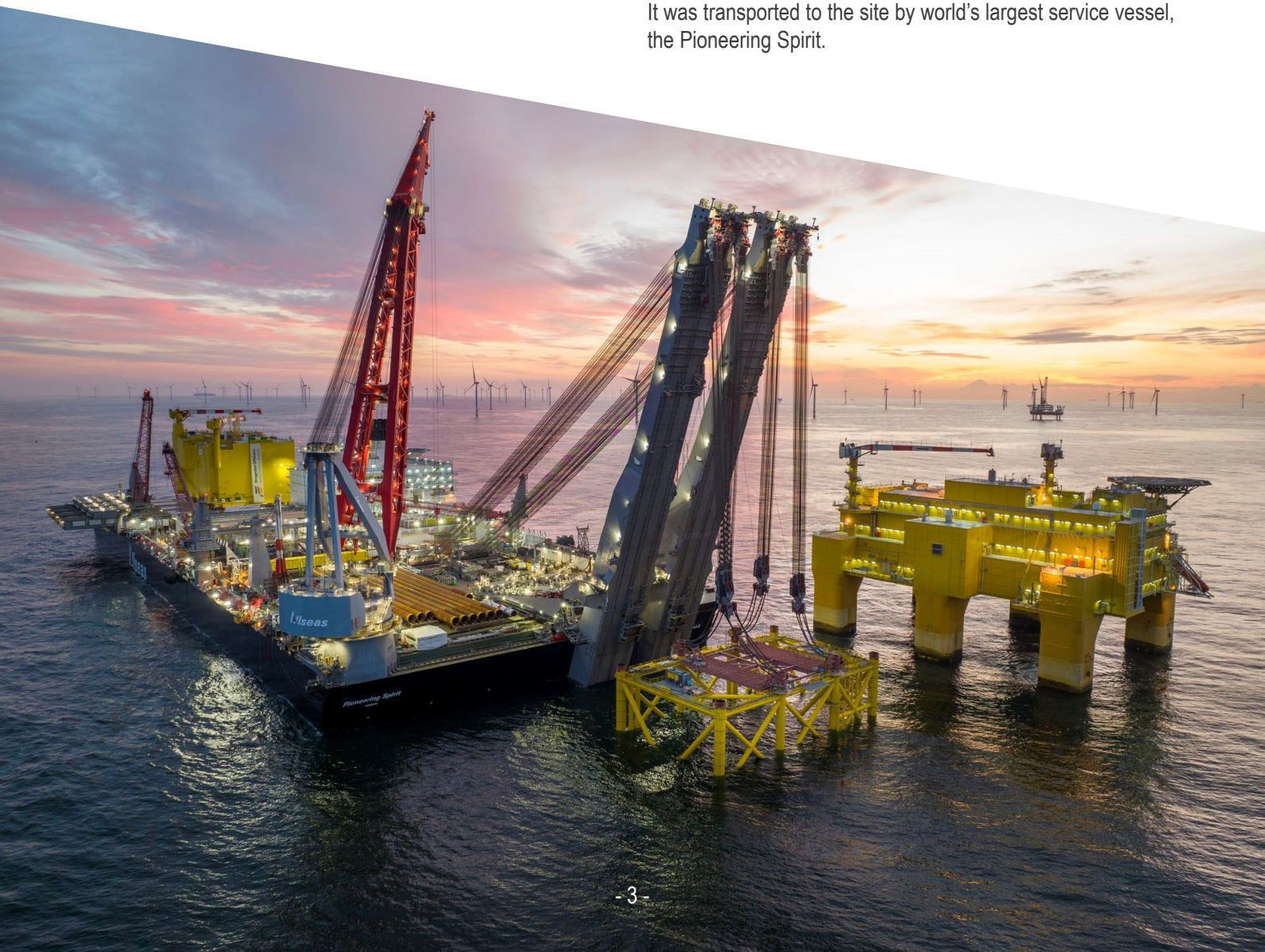
TenneT has carried out the sail-out of the offshore platform DolWin kappa from the Dragados Offshore shipyard in Cádiz, Spain.

The platform consists of a foundation structure (jacket) and a superstructure (topside).

The two have a combined height of about 82 metres, so the platform will rise about 53 metres above the surface of the North Sea.

In addition, there will be a bridge that will connect DolWin kappa with DolWin beta (grid connection system DolWin2), which was already commissioned in 2016, in order to efficiently use the already existing infrastructure of the parent platform.

It was transported to the site by world's largest service vessel, the Pioneering Spirit.



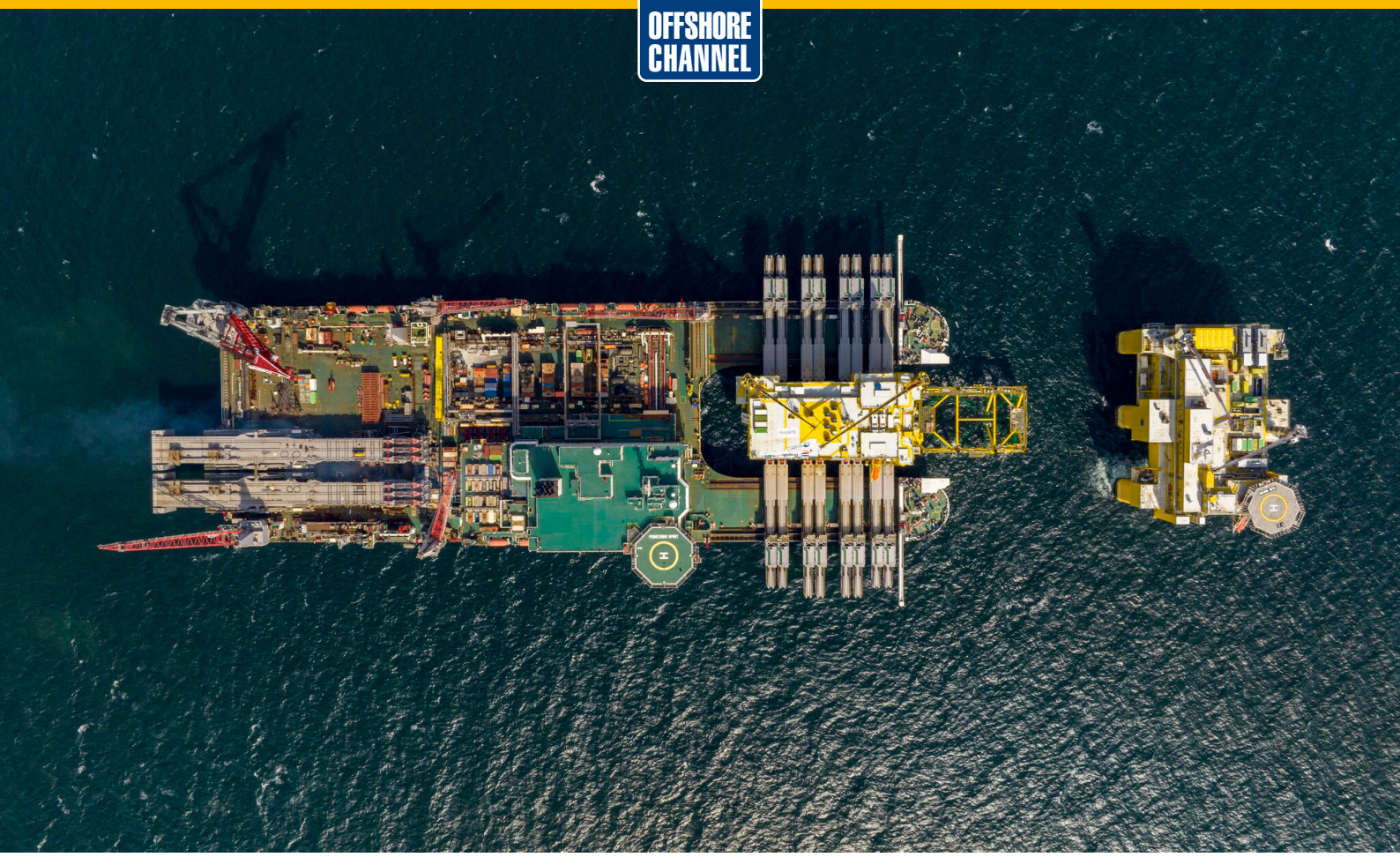
DOLWIN KAPPA INSTALLATION: ALLSEAS STRENGTHENS POSITION IN OFFSHORE WIND

Allseas' Pioneering Spirit has successfully installed TenneT's 900-megawatt DolWin kappa offshore converter station for the DolWin6 offshore grid connection system in the German North Sea.

DolWin kappa was constructed at the Dragados Offshore shipyard in Cadiz, Spain. Siemens Energy was commissioned by TenneT as general contractor to build the system.

Comprising an approximately 5,000-tonne foundation jacket and 11,000-tonne topsides housing high-voltage direct current (HVDC) technology, DolWin kappa is Allseas' first complete platform installation for the offshore wind industry.

Completed on 4 September after a 12-day campaign, installation of DolWin kappa – including piling of jacket foundations – again demonstrates Allseas' ability to execute technically challenging offshore projects.



Complete transport and installation solution

Designed and built by Dragados Offshore in Cádiz, Spain, DolWin kappa arrived in the Port of Rotterdam in mid-August on Allseas' cargo barge Iron Lady. In a quick turnaround operation, all components – jacket, topsides, piles and connecting bridge – were transferred to the world's largest construction vessel for transport to the installation site.

All components were installed directly from Pioneering Spirit, using both the topside and jacket lift systems. In another first for Allseas, the 5,000-tonne special purpose crane was deployed to drive the 10 foundation piles up to 68 metres deep into the seabed to secure the foundation jacket.

The project confirms Allseas can adapt Pioneering Spirit's single-lift capability to provide fast and efficient transport and installation solutions for the fast-growing offshore wind market, strengthening our ambition to become a key contractor in the renewables space.

Sustainable solutions to facilitate energy transition

The installation of DolWin kappa is key to unlocking additional North Sea wind energy capacity, advancing offshore grid expansion in support of Europe's energy security. TenneT's DolWin6 connection will provide more than 1 million homes with renewable energy when it comes on line in 2023.

Allseas is committed to driving sustainability offshore by pioneering solutions onshore to facilitate the transition and safeguard energy affordability.

Pioneering Spirit's size and versatility delivers high workability all year round, fast-tracking the development cycle and enabling our clients to realise their project ambitions sooner.

Creative concepts for new challenges

DolWin kappa follows substation installations end 2021 / start 2022 for the Hollandse Kust Zuid (HKZ) offshore project off the Dutch coast for German-Dutch green grid operator TenneT, and the Saint-Nazaire wind farm in France.

Allseas is also developing new concepts for the installation of next generation turbines and foundations required to meet growing demand for renewable offshore energy.

HEEREMA'S SLEIPNIR STARTS GBS INSTALLATION FOR FÉCAMP OWF

The gravity foundations are transported three-by-three by tugs to their final location at sea, using a fleet of three cargo barges belonging to Saipem. They will rotate between the Bougainville Quay of the Ville du Havre to the coast of the VilledeFécamp.

They are operated by Bouygues Travaux Publics, Boskalis, Saipem, and its subcontractor Sarens, and these maneuvers will take several weeks.

Heerema Marine Contractors' Sleipnir, one of the most powerful crane vessels in the world, is installing the gravity base structure foundations on behalf of our client Saipem. We are lowering the structures onto the seabed that Boskalis prepared.

Some key facts:

- 15,000 metric tons on each barge (5,000 MT per GBS)
- The Fécamp Offshore site is located approximately between 13 and 22 km from the coast of the Port of Fécamp.
- Between 12 and 15 hours of crossing between the Port of Le Havre and the Fécamp Offshore Site.

FIRST BATCH OF SAINT-BRIEUC JACKETS INSTALLED

The installation of the first four jacket foundations has been completed at the Saint-Brieuc offshore wind farm in France.

The installation of the foundations started at the beginning of this month, while the first jacket was installed on 4 July by Van Oord using Subsea 7's Seven Borealis vessel.

The foundations, which will support 62 Siemens Gamesa 8 MW wind turbines, are being delivered by the Navantia-Windar consortium, which sent off the first batch last month and has been performing part of its project in Brest, France.

ALL 47 WIND TURBINE JACKET FOUNDATIONS & SUBSEA CABLES OF FORMOSA2 HAVE COMPLETED INSTALLED

Each of the jacket foundation weighs about 1,581 tons and reaches a height of 91 meters.

After the completion of Formosa 2, the total installed capacity will be 376 MW, which is expected to provide clean wind energy to about 380,000 households every year.

The project is being jointly developed by JERA (49%), Macquarie's Green Investment Group (26%) and Swancor Renewable Energy (25%).

DEME
Dredging, Environmental & Marine Engineering

DEME OFFSHORE HAS SUCCESSFULLY INSTALLED THE OFFSHORE SUBSTATION OF THE FÉCAMP OFFSHORE WIND FARM, DEPLOYING 'ORION', THE NEWEST MEMBER OF THE DEME FLEET AND THE MOST INNOVATIVE VESSEL IN THE OFFSHORE WIND INDUSTRY.

Orion' has now installed the 1,300-tonne jacket and the 2,200-tonne topside, completing the project on schedule on August 11.

Just four months previously, DEME carried out the pre-installation of the offshore substation's foundations utilising another member of the fleet, the DP2 jack-up vessel 'Sea Installer'. DEME Offshore's unique subsea template facilitated a seamless installation, although in challenging environmental and soil conditions.

In August 2021, DEME installed the very first offshore substation in France at the Saint-Nazaire offshore wind farm, deploying Allseas' heavy lift vessel 'Pioneering Spirit'. TheFécamp and Saint-Nazaire successful substation installations again demonstrate DEME Offshore's capability to carry out technically demanding and pioneering project

Sif

BUSY DAYS AT MAASVLAKTE SITE!

Currently Sif Group are providing simultaneous berth for the load out of foundations and turbines by three of the world's biggest installation vessels present at Maasvlakte site.

DEME Group's Innovation is loading out our monopile foundations and also transition pieces for the Dogger Bank Wind Farm project which is being built by SSE Renewables, Equinor, and Eni Plenitude.

2 more vessels are taking care of the Hollandse Kust Zuid parts:

Wind Osprey is loading out the towers and blades for the Hollandse Kust Zuid project.

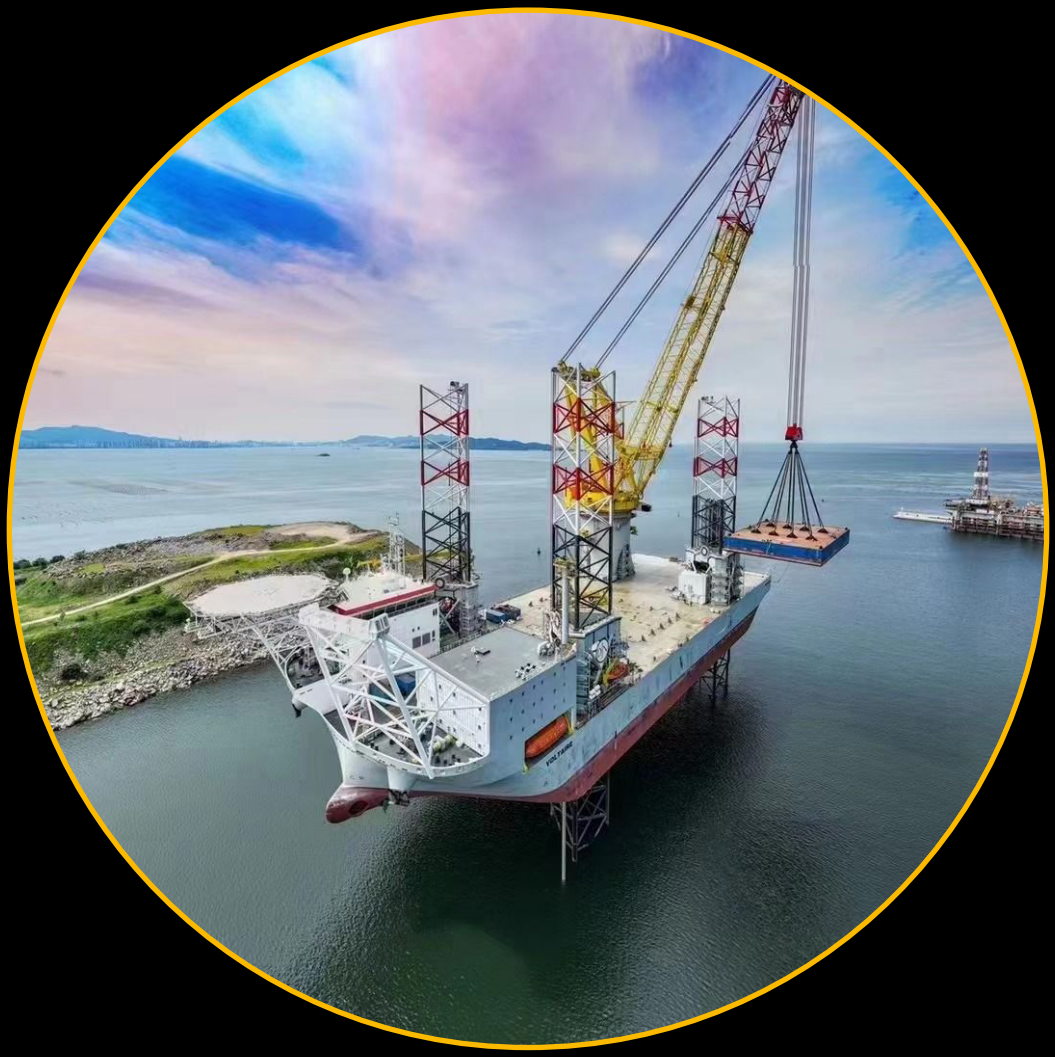
Seaway 7 Strashnov is loading out our TP-less monopiles for the Hollandse Kust Zuid project.

Also, Rotra Mare uses our RoRo quay for a tower delivery for Siemens Gamesa.

Photo: @Martens Multimedia

VOLTAIRE LOAD TESTING IN PROGRESS

Jan De Nul GROUP



This vessel will be the second and largest jack-up vessel in Jan De Nul's fleet, and able to support the renewable energy industry to build next generation offshore wind farms.

BELUGA 01

The seagoing and hybrid unmanned survey vessel, arrived safe and sound in the Netherlands.

The Beluga 01 will carry out hydrographic and water quality measurements at the project.

The Beluga 01 is based on the innovative Maritime Robotics' Mariner class USV, which for years has proven its mobility and seaworthiness for data acquisition under rough conditions. Maritime Robotics' system convinced Jan De Nul of its well-engineered high-quality design, based on 10 years of experience. It is a user-friendly, cost-effective and low-risk platform for data acquisition at sea as an alternative or adjunct to larger manned vessels.

Jan De Nul is herewith the first dredging contractor to deploy an unmanned survey vehicle in marine and offshore conditions.

THE FUTURE OF AUTONOMOUS INSPECTION & MONITORING OF WATERWAYS, PORTS AND COASTS

AQUATIC DRONES

Deeper insight - lower costs - smaller carbon footprint

CHALLENGES

There is growing need for data

Sailing personnel and inspectors are hard to find

Scaling up 5 to 10x more data does not fit the current budgets to deploy more equipment and people

This requires autonomous survey vessels & predictive software: more cost efficient, deployable 24/7, safer (unmanned), carbon neutral.

We're offering a high service level and portfolio in ports, coast and rivers compared to competition.

OUR SOLUTIONS

Autonomous Surface Vessel

The Phoenix 5 is an Autonomous Surface Vessel (ASV) of 5 by 2 meters that automatically collects data with a wide range of survey sensors.

Predictive Data Model

Predictive maintenance models can help you plan dredging operations, repairs and water quality improvements more effectively.

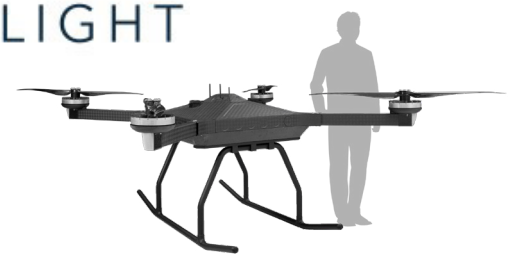
Added value of unmanned operations

- 24/7 operation
- Fully autonomous
- 0-1 person crew
- High safety
- Low OPEX
- Clean tech
- Low Capex
- Multiple applications

- ✓ Hydrographic surveys (bathymetry)
- ✓ Sub-bottom profiling
- ✓ Side-scan sonar
- ✓ Civil engineering structures (quays, dams, etc.)
- ✓ Safety & security
- ✓ Water quality
- ✓ Marine ecology
- ✓ Offshore wind turbines & cables

FLYING CRANES IS CAPABLE OF LIFTING AND DELIVERING UP TO 200 KGS. PAYLOAD, WITH HIGH PRECISION. SPECIALLY DESIGNED TO AID THE GREEN SECTOR TO KEEP THEIR OPERATIONS GREEN

AIRFLIGHT



Airflight's flying crane innovations make servicing wind turbines fast, safe, and easy.

The flying crane is able to automatically take off and land in a safe and controlled manner, allowing you to focus purely on the safety of your payload and the people around you.

The flying crane is fitted with a variety of sensors giving it the ability to automatically detect and avoid any obstacles in its environment. This keeps operations safe for both people and equipment.

The flying crane is ready to operate in less than 30 minutes.

V236-15.0 MW PROTOTYPE NACELLE COMPLETED AND READY FOR TESTING

The completion of the V236-15.0 MW™ prototype nacelle at the factory in Lindø, port of Odense is the culmination of the dedicated efforts of a wide range of Vestas teams. The new design is now ready for testing.

“Completing the V236-15.0 MW™ prototype nacelle is a great milestone and an important step forward for Vestas and our customers. By leveraging Vestas’ extensive proven technology, the new platform combines innovation with certainty to offer industry-leading performance while reaping the benefits of building on the supply chain of our entire product portfolio. The new offshore platform forms a solid foundation for future products and upgrades,” Anders Nielsen, Vestas Chief Technology Officer, explains.

The V236-15.0MW™ moves the boundaries of offshore wind energy forward, with one single turbine being capable of producing up to 80GWh/Year depending on site-specific conditions, which is enough energy to power more than 20,000 households

Ørsted

HORNSEA 2, THE WORLD'S LARGEST WINDFARM, ENTERS FULL OPERATION

Ørsted is proud to announce that the world's largest installed windfarm, Hornsea 2, is now fully operational.

The 1.3GW project comprises 165 wind turbines, located 89km off the Yorkshire Coast, which will help power over 1.4 million UK homes with low-cost, clean and secure renewable energy. It is situated alongside its sister project Hornsea 1, which together can power 2.5 million homes and make a significant contribution to the UK Government's ambition of having 50 GW offshore wind in operation by 2030.

The Hornsea Zone, an area of the North Sea covering more than 2,000 sq km, is also set to include Hornsea 3. The 2.8GW project is planned to follow Hornsea 2 having been awarded a contract for difference from the UK government earlier this year.

Hornsea 2 has played a key role in the ongoing development of a larger and sustainably competitive UK supply chain to support the next phase of the UK's offshore wind success story. In the past five years alone, Ørsted has placed major contracts with nearly 200 UK suppliers with £4.5 billion invested to date and a further £8.6 billion expected to be invested over the next decade.

Ørsted now has 13 operational offshore wind farms in the UK, providing 6.2GW of renewable electricity for the UK – enough to power more than 7 million homes. Hornsea 2 makes a significant contribution to Ørsted's global ambition of installing 30 GW offshore wind by 2030. Ørsted currently has approx. 8.9 GW offshore wind in operation, approx. 2.2 GW under construction, and another almost 11 GW of awarded capacity under development including Hornsea 3.

CHINA DOMINATES OFFSHORE WIND RANKINGS, GLOBAL OPERATING CAPACITY AT 55 GW – WFO

6,759 MW of offshore wind capacity went into operation during the first six months of 2022 compared to 1,627 MW during the same period a year earlier, World Forum Offshore Wind (WFO) said in its Global Offshore Wind Report HY1 2022.

This growth was mainly driven by China which installed 5.1 GW of new offshore wind capacity in the first half of 2022, WFO said.

Global installed offshore wind capacity reached 54.9 GW by the end of June 2022, according to the report.

33 new offshore wind farms went into operation, meaning all turbines were installed and the first power was achieved, worldwide during the first half of 2022, of which 25 were installed in China, five in Vietnam, one in the UK, one in South Korea, and one in Italy.

China expanded its position as the world's largest offshore wind market by far with 24.9 GW of installed capacity, more than the UK (13.6 GW), Germany (7.7 GW), and the Netherlands (3 GW) combined, WFO said.

ARATELLUS KICKS OFF TWINHUB GEO SURVEY FOR HEXICON

Investigations will inform engineering design for 32MW floating offshore project in Celtic Sea

Site investigations are now underway for Hexicon's 32MW TwinHub floating offshore wind project in the Celtic Sea.

The first phase of the survey works has been awarded to Aratellus Offshore, which has subcontracted Sulmara Subsea to perform the geophysical survey.

Survey vessel Vos Sweet mobilised from the port of Falmouth in Cornwall this week with field operations anticipated to last between two to three weeks.

The investigation will plan subsea routes, inspect existing cables and perform detailed design of mooring anchors and chains, Aratellus said.

The results of the final project will be used to progress the front-end engineering design for TwinHub, which will deploy Hexicon's TwinWind duel turbine floating foundation.

DHSS

OFFSHORE WIND PROJECTS EUROPE

SHIPS AGENCY

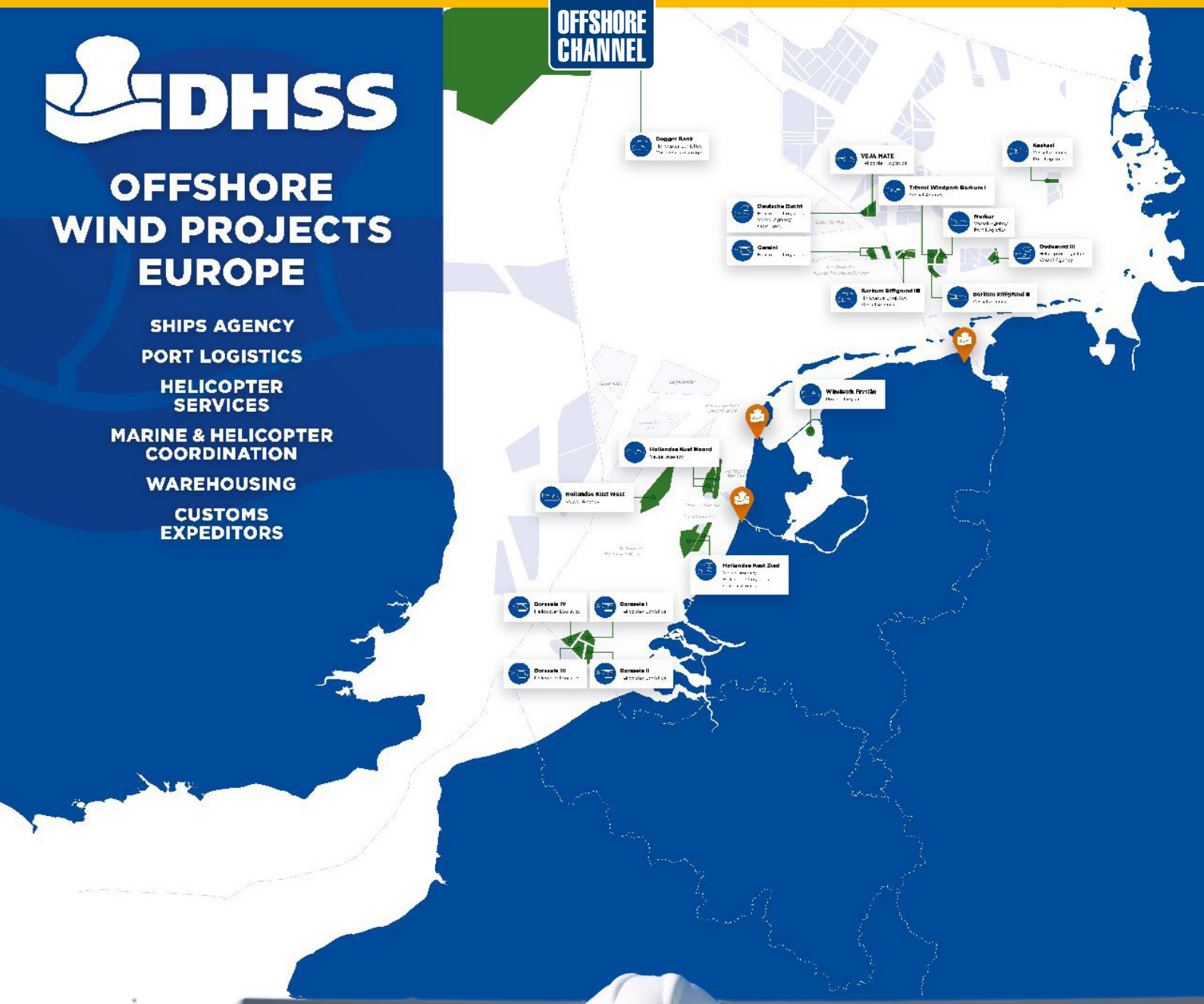
PORT LOGISTICS

HELICOPTER SERVICES

MARINE & HELICOPTER COORDINATION

WAREHOUSING

CUSTOMS EXPEDITORS



DHSS

OUR HISTORY IS THE FUTURE

DHSS serves the offshore energy industry since 1997, by delivering high-quality vessel agency services, 3PL warehousing and helicopter logistics. From our strategic support bases in Den Helder, IJmuiden and Eemshaven, we have established a smooth running network, to serve our clients in each strategic port of the Netherlands. Out of these support bases, agency coverage is granted in all ports in the Netherlands.

Our aviation control tower at Den Helder Airport is focusing on helicopter operations for the Southern North Sea area since 1998 to complete our logistics commitment. DHSS is taking care of your helicopter flights at each offshore related heliport. Not only in the Netherlands, but also in Germany, UK and Belgium. This includes chartering of helicopters, in most efficient and flexible way.

We provide complete transparency to our global based clients in all our facets of activities and provide the best service in the industry.

These are the reasons why we are growing — because we challenge the norm, via our five value propositions:

- Our people
- Our service execution
- Our local network
- Our compliance & quality
- Our account management

Along the years a lot of challenges have strengthen the firm, runned by our people, the most valuable source of DHSS

MAERSK SUPPLY SERVICE AND STIESDAL OFFSHORE TO ENTER FLOATING WIND PARTNERSHIP

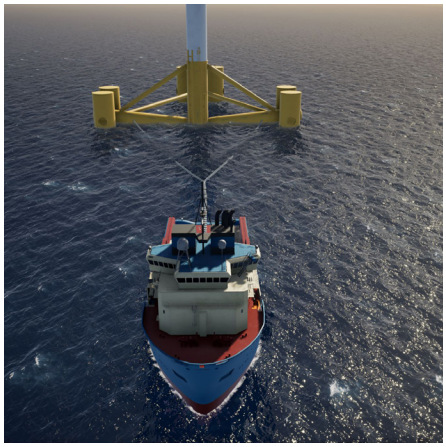
Stiesdal®

MAERSK SUPPLY SERVICE

Building on the companies' individual positions in the floating wind industry, Maersk Supply Service and Stiesdal Offshore have entered into a strategic partnership to offer combined solutions to this fast-growing sector within offshore wind.

With significant expansion predicted for floating wind, this emergent technology has the potential to play a pivotal role in the urgent transition to renewable energy. To support and accelerate its development, the two Danish companies intend to combine their respective strengths to create comprehensive and integrated engineering, procurement, construction and installation (EPCI) solutions for foundations and moorings. This integrated approach will streamline the value chain, facilitating fast-track installations and ultimately bringing down the levelised costs of floating wind.

Stiesdal Offshore and Maersk Supply Service are both well established in the floating wind industry. Since 2017, Stiesdal Offshore has been developing the innovative Tetra concept, the world's first fully industrialised floating technology. Based on factory-made modules assembled in port to form a complete foundation, the Tetra concept reduces manufacturing hours significantly, achieving a lightweight and cost-effective floating foundation. In cooperation with Shell, RWE and TEPCO Renewable Power, Stiesdal built and installed the first Tetra floater off the west coast of Norway in 2021, demonstrating the cost-saving and rationalisation potential of the concept. As the need for clean energy continues to grow, Stiesdal is well equipped to supply the technologies for mass-produced, low-cost floating offshore wind power.



FRED. OLSEN 1848 BACKS OPPORTUNITY CROMARTY FIRTH'S GREEN FREEPORT BID WITH PLANS FOR AN INNOVATIVE MOBILE PORT SOLUTION

Fred. Olsen 1848, a renewable energy innovation company, is exploring the deployment of a mobile quayside, known as the Mobile Port Solution, as part of Opportunity Cromarty Firth's(OCF) bid to become a Green Freeport.

Building upon the existing infrastructure and competencies for manufacturing, assembly and integration of large industrial scale floating offshore wind structures, the Mobile Port Solution will enhance the floating offshore wind supply chain and infrastructure in Scotland, not the least in the Highlands, and contribute to establishing a floating offshore wind cluster in Inverness and the Cromarty Firth.

The Mobile Port Solution is based on proven technology with minimum environmental impact and builds on existing infrastructure. A wind turbine installation vessel combined with a storage barge, will be located at a suitable location within Cromarty Firth, creating sufficient space and working conditions during the pre-assembly, pre-commissioning, and wind turbine installation on the floating foundation.

CEO of Fred. Olsen 1848, Sofie Olsen Jebsen, states: "Our journey in renewables began 30 years ago, and today Fred. Olsen-related companies employ more than 2,500 people within the renewable energy sector and have in-depth experience from offshore wind. With more than 380 employed people in Scotland across the Fred. Olsen related companies, our focus has always been to create value for the Scottish economy, local suppliers and communities.

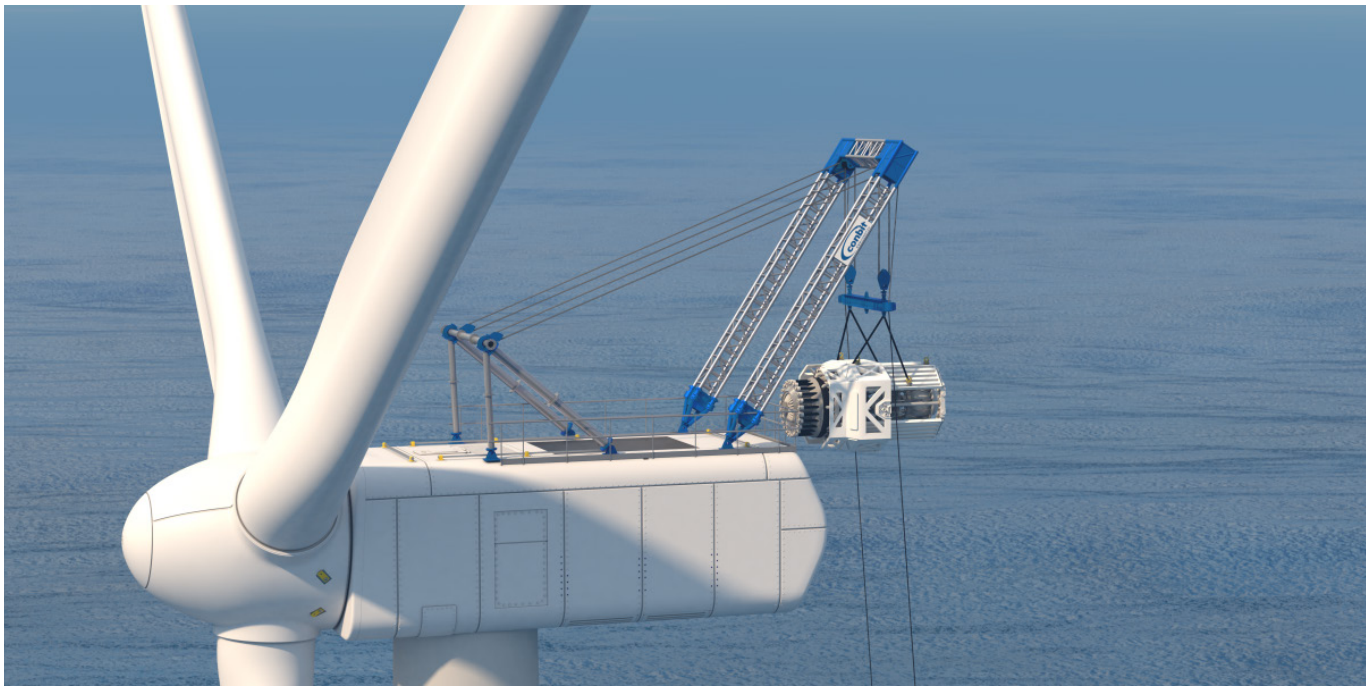
"By setting up the Mobile Port Solution in the Firth, Fred. Olsen 1848 would provide an immediate solution for the rapid and cost-efficient installation of floating offshore wind, enabling the creation of new attractive green job opportunities, not only to the Firth but also for the UK in general. This presents an opportunity for the whole Scottish supply chain, including Fred. Olsen 1848 and other Fred. Olsen-related companies, and we support the Inverness and Cromarty Firth Green Freeport bid."

The opportunity was further described in a letter of support to OCF's Green Freeport bid from Esben Strandgaard Kyndesen, Chief Commercial Officer of Fred. Olsen 1848. Kyndesen stated that Inverness and the Cromarty Firth has "the ideal geographical location" for a floating offshore wind cluster as recommended by the Scottish Offshore Wind Energy Council (SOWEC) in a recent independent report.

He said: "Cromarty Firth offers ideal infrastructure and competencies for manufacturing, assembly and integration of floating offshore wind structures at the size and scale required by the industry, which will be enhanced further with the innovative Mobile Port Solution."

Bob Buskie, Chief Executive of the Port of Cromarty Firth, speaking on behalf of OCF, said: "OCF is delighted that Fred. Olsen 1848 is supporting our bid to achieve Green Freeport status for Inverness and the Cromarty Firth. The importance of this status to not only the Highlands but also Scotland as a whole cannot be underestimated. It would bring skilled green jobs and high-wage opportunities on a level not seen since the 1970s oil boom.

"The Fred. Olsen 1848 Mobile Port Solution would increase available infrastructure and, used in conjunction with the excellent existing port facilities at Invergordon and Nigg, would enable the Firth to support a larger number of offshore wind projects and accelerate the shift to green energy."



2 STEPS TO START LIFTING HEAVY COMPONENTS INSIDE OFFSHORE WIND TURBINES

conbit
WWW.CONBIT.EU
PART OF MAMMOET

Lifting in Offshore Wind

Operators of offshore wind farms request Conbit to maintain or modify their projects. We are often asked to perform lifting at substations outside the reach of the deck crane.

The floating offshore wind industry will complete its business case with Conbit's unique replacement system for major components inside wind turbine generators.

Other projects Conbit in which Conbit can add value to your lifting challenge are:

- Array cable pulling
- Crane maintenance
- Wall panel repair
- Boat landing replacements
- Structural modifications to substations

THE ONS STORY

ONS 2022 TRUST

29 AUG – 1 SEPT STAVANGER – NORWAY

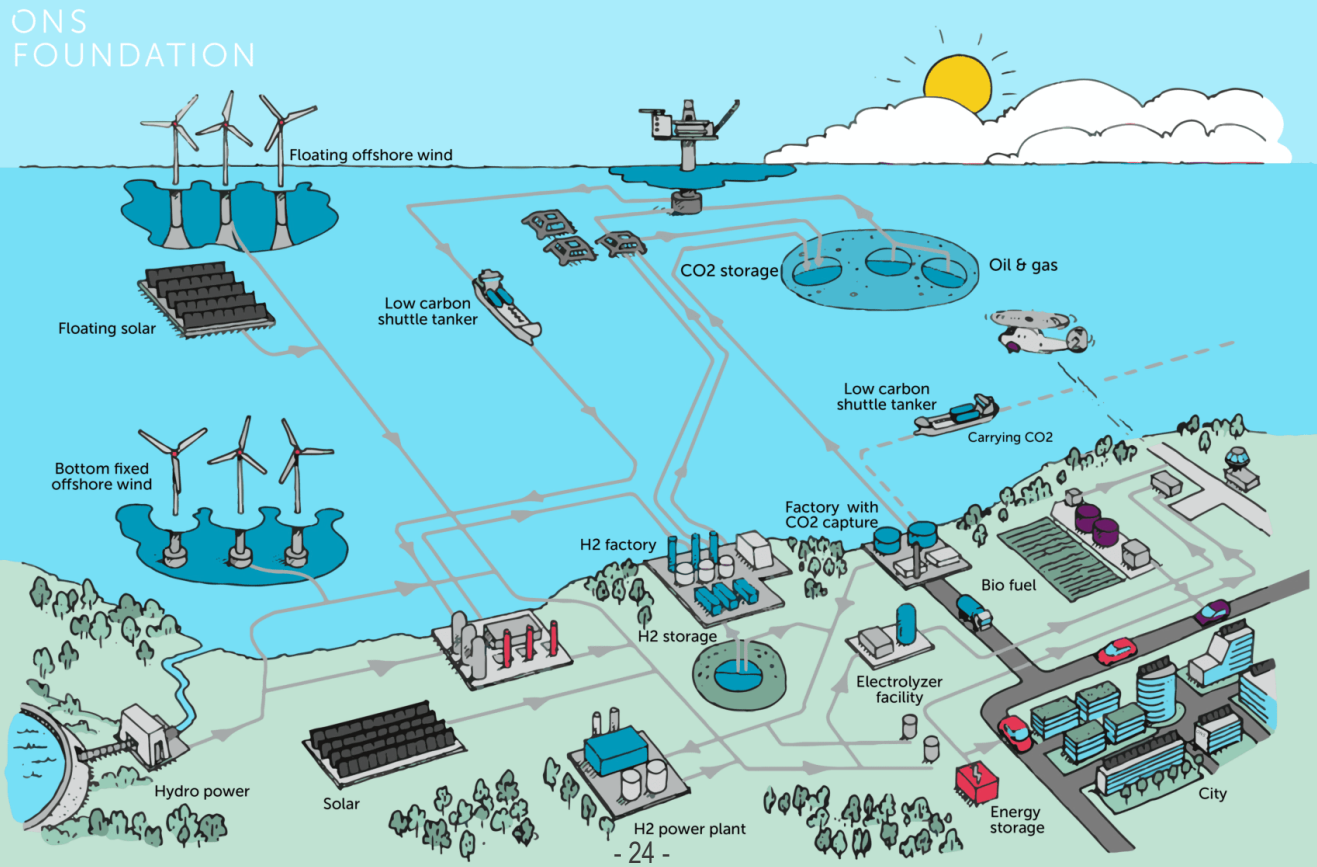
The ONS Foundation is a world-leading, non-profit organisation facilitating discussions and collaboration on energy, technology and innovation.

When oil and gas was discovered in the North Sea, the need for a meeting place for the companies in this new industry emerged. ONS was short for Offshore Northerns Seas, as the event was targeted at companies with business in the North Sea basin. Today, the event attracts visitors for all over the world, and is known as just ONS.

For decades the ONS Foundation has developed an international network with representatives from industry, authorities, academia and research institutions. The foundation has several working committees represented by more than 250 leaders from industry and politics. The committees advise and shape the programme and direction of our work.

The ONS Foundation partners with prominent organisations to facilitate global events and network meeting. The Goal is to exchange ideas, learn and build relationships between industry, government and society.

The ONS Foundation is a non-profit organisation. We are proud and grateful to be under the patronage of HM King Harald of Norway. The royal patronage encourages us to strive harder to achieve our goal of being an invaluable catalyst within the energy community



JET'S FLOATING 5G BASE STATION PLATFORM LAUNCHED, PROVIDING 5G AT SEA

JET ENGINEERING
5G AT SEA

JET Engineering System Solutions has deployed its most advanced buoy yet to deliver 5G enabled offshore connectivity and data collection. JET-4 Babel is a floating 5G base station platform, meaning that it transmits coverage for devices to connect to, increasing the distance from the shore that 5G signal can be established.

Existing 5G infrastructure is limited around the UK coast. Absence of even a simple phone signal has huge safety implications around our shorelines and in the water, not to mention the lack of access to benefits that enhanced connectivity offers businesses and people in those areas. This is usually because mobile networks are focus foremost on providing connections to urban areas with a larger number of users.

Recent research from initiatives like the Dorset Council led 5G RuralDorset project have proven the need for 5G to enable essential safety, environmental, and efficiency considerations for those living and working in rural, coastal, and offshore settings.

JET's floating network solution extends the capabilities that 5G enables from the shore out into the sea, as well as providing a platform for a multitude of data collection and live streaming to users elsewhere, either as raw data or through a user-friendly dashboard.

James Thomas, CEO at JET Engineering, said: "I am incredibly proud of the JET team for the world leading work they have done to make 5G at sea a reality. Having founded the company in 2020 we have been limited to doing a lot of development work remotely, and this deployment brought the perfect opportunity to bring the team together on the boat to see the buoy launched. Watching the buoy-to-buoy communications with real time camera feeds was a great moment for us.

"This signifies a great technology milestone for JET, having taken the buoy-to-buoy wireless communications from the lab to the ocean. But more importantly we have unlocked a whole host of possibilities for users and service providers to save costs, improve efficiencies, and make their everyday work easier. I would like to thank everyone that has supported and partnered with us to get to this stage."

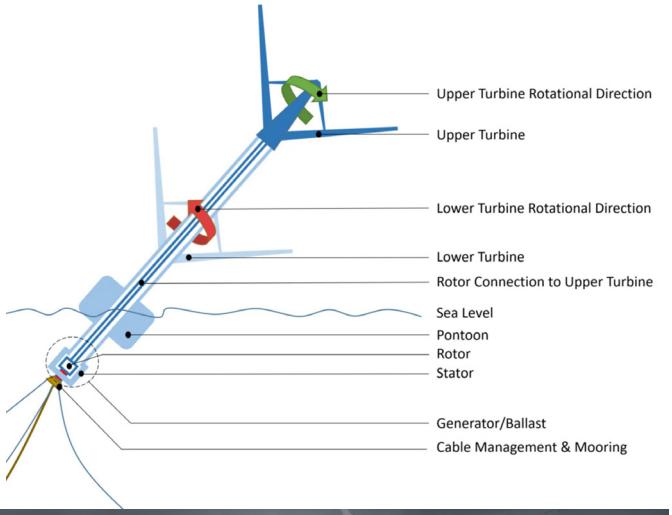
Please get in touch with us to discuss on sales@jet-eng.com.

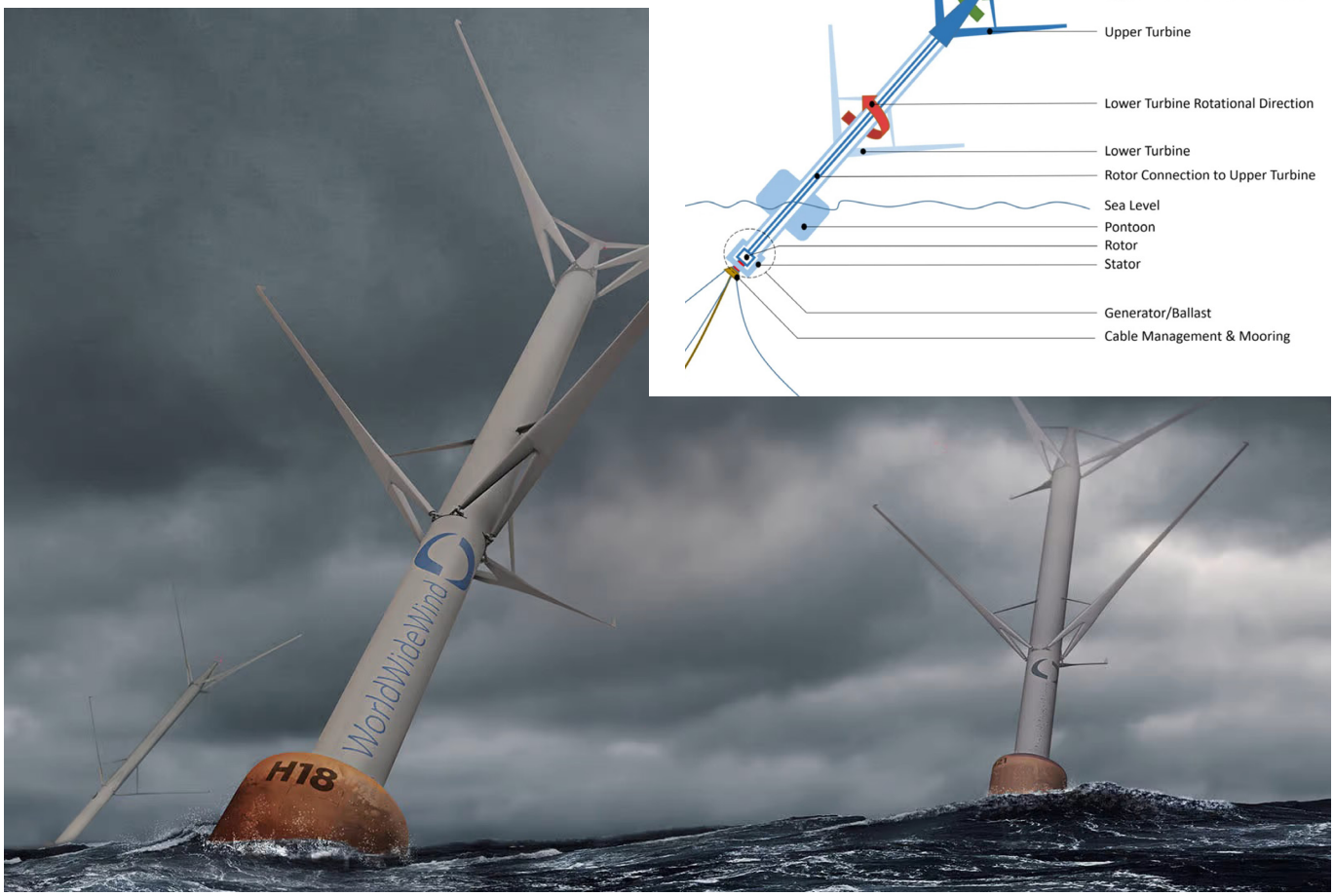
CONTRA-ROTATING FLOATING TURBINES PROMISE UNPRECEDENTED SCALE & POWER

Norway's World Wide Wind has a radically different take on offshore wind power. These floating, vertical-axis wind turbines (VAWTs) feature two sets of blades, tuned to contra-rotate – and they promise more than double the output of today's biggest turbines.

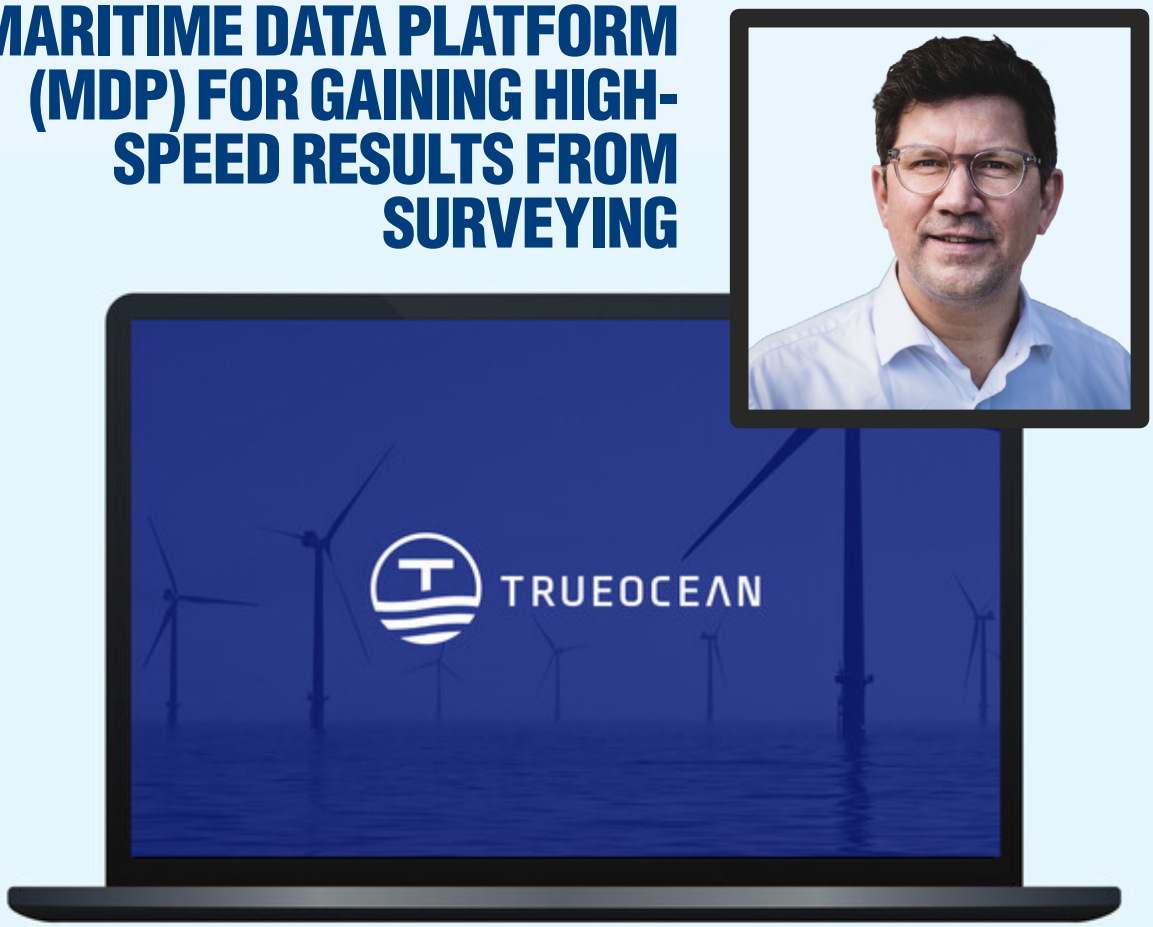
Taking wind farms way offshore can certainly help make them less obtrusive, and open up a lot more opportunities – but as the ocean gets deeper, conventional horizontal-axis wind turbines (HAWTs) begin making less and less sense. HAWTs need to hold a lot of heavy components – drivetrains, gearboxes, generators and their colossal blades – right up the top of a long pole, so mounting them on floating platforms that don't want to tip over is a huge challenge – not to mention maintaining the business end of a turbine so far above the ground.

Some engineers and operators believe this could be a niche where VAWTs could shine instead. Their blades reach upward, but all their other heavy bits are at the bottom, so their natural tendency is to sit upright. Also, they can accept wind energy from any direction, rather than needing to turn to face into the wind, cutting down on some more heavy gear you'd find up high on a HAWT. They're typically far less efficient than a regular three-blade HAWT, sucking less energy out of a given breeze, but on the other hand, you can place them closer together without a drop in performance, meaning they could potentially suck more energy out of a given patch of ocean





BUILDING NEW OFFSHORE WIND FARMS IN A FRACTION OF THE TIME – KIEL-BASED STARTUP CREATES SMART MARITIME DATA PLATFORM (MDP) FOR GAINING HIGH-SPEED RESULTS FROM SURVEYING



TRUEOCEAN

Maritime surveying is one of the most difficult and most time-consuming steps in offshore wind energy projects. TrueOcean radically shortens the process of data processing into information with its cloud-based maritime data platform (MDP). Underwater sensor data can be accessed in near real-time. In addition, automated analytics accelerate the process for better quality results with standardized parameters. After three years of development, the company is now announcing its official product launch.

The Kiel-based team is bringing the speed of cloud technology, as users know from other industries, to the maritime industry. Data is stored according to the highest security standards in a platform specifically optimized for sensor data. “We will successively integrate further automation and industry specific services,” emphasizes co-founder and CEO Frithjof Hennemann. However, the platform is already massively supporting the data value stream of wind energy operators: “Collected data can be directly transmitted to our platform. Data is safely stored in one maintained and secured data space and ready to be managed and processed. It is accessible to all project stakeholders according to their permission given.”

STILLSTROM BY MAERSK

A newly launched offshore charging company, has today announced that it will collaborate with port of aberdeen on a pioneering project to significantly reduce emissions from vessels on standby outside the port

Under the memorandum of understanding, Stillstrom and Port of Aberdeen will conduct a joint feasibility study into an innovative offshore renewable charging hub. The ocean clean-tech concept provides a platform for vessels to utilise electricity from either offshore wind or grid-energy, thereby eliminating the need for vessels to consume fossil fuels while idling. The product also allows for the charging of battery packs on applicable vessels.

The study, which will run until the end of the year, will develop a roadmap for the potential introduction of offshore charging infrastructure at the Port of Aberdeen. Stillstrom and the Port will analyse the benefits, use cases, fundamental requirements, economics, and stake-holder involvement as part of the study. Stillstrom's offshore charging concept is relevant for multiple stakeholders across ocean industries, from offshore renewables to idling merchant vessels within ports & hubs.

Developed in-house by Maersk Supply Service, Stillstrom's mission is to provide solutions for decarbonising the offshore industry. Headquartered in Copenhagen, Maersk Supply Service has a long-standing presence in Aberdeen, having opened its Aberdeen office in 1976 and with a number of its deep-water anchor-handling vessels operating out of the port for charters in the North Sea.

The Port of Aberdeen is one of UK's busiest ports, with more than 6,000 vessels visiting and anchoring outside every year. Aberdeen's 'Green Port' strategy is well developed and explores a wide range of emissions reduction opportunities, including quayside electrification, the use of alternative fuels and lower carbon power supplies, and sustainable waste management.

Nexans
ELECTRIFY THE FUTURE

OFFSHORE AND ONSHORE EXPORT CABLES FOR SEAGREEN, THE LARGEST WINDFARM PROJECT IN SCOTLAND

About the project

Phase 1 development, comprising the Seagreen Alpha and Bravo wind farms. It will have combined capacity of 1,075MW. When complete it will form the largest windfarm project in Scotland when they come online in 2024. To promote contract opportunities for local companies, SSE Renewables organises 'Meet the Buyer' events, where they can discuss their service offerings with members of the supply chain.

Nexans' solution

Nexans is SSE's preferred supplier for the design, manufacture and installation of the onshore and offshore export cables. Nexans will supply and install three 65 km offshore export cables and three 20 km onshore export cables.

THE TMS ANODE CAGE INSTALLATION TOOL SUCCESSFULLY INSTALLED THE FIRST BATCH OF ANODE CAGES ON A NEW OFFSHORE WIND PROJECT IN THE BALTIC SEA ON MONO PILES OF 9,4M DIAMETER

The cages have a diameter of 10,3m and are installed 40m below sea level. The tool is remote operated from deck and provided with subsea lamps and cameras.

TMS is strong in development of equipment used in the offshore industry. TMS develops and supplies turnkey equipment which are characterized by: efficiency, flexibility and reliability.

TMS is strong in development of equipment used in the offshore industry. TMS develops and supplies turnkey equipment which are characterized by: efficiency, flexibility and reliability

INDEPENDENT ADVISORS SUPPORTING THE GREEN ENERGY TRANSITION IN SOUTH KOREA

ER - MARINE

We work as advisers, interim leaders and partners who tell you what you need to know - not always what you want to hear

Our expertise covers the complete life- cycle

After 2 years working in floating wind Korea solving many challenges due to COVID we are know streamlining our solutions to the 4 major challenges

- Solving fishermen challenge
- Input to T&I and O&M technical and local Korean challenges
- Input to mooring challenges in Korea based on our lidar buoy deployment lessons- learned
- Input to Digital Twin solutions based on our past asset management experience with highest focus on lowering OPEX

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Email: ERoelans@ER-Marine.com
H.Choi@ER-Marine.com
Website: www.ER-Marine.com

LIFTRA HAS SUCCESSFULLY DEMONSTRATED AN OFFSHORE MAIN COMPONENT REPLACEMENT OPERATION FROM A FLOATING BARGE

The job was carried out for Innovent and proceeded as follows:

- The barge with the LT1200 Liftra Self-Hoisting Crane was positioned close to the offshore turbine
- The turbine specific base and the crane was installed
- The turbine rotor was lowered down onto the barge, with taglines guiding the rotor during the rotor lift.
- The replacement of the turbine main component was completed, and rotor was reinstalled followed by an uninstallation of the LT1200 Crane.

This demonstration was Liftra's first commercial project with this offshore solution. In the years to come, we foresee a variety of jobs within the nearshore and offshore sector.

For more information reach out to:
Product Group Director,
Mikael Thorndal Madsen, MTM@liftra.com

DISRUPTIVE AMERICAN OFFSHORE WIND TURBINE PROTOTYPE FLOATS OVER MASSIVE 30 METER WAVES DURING WAVE TANK TEST.

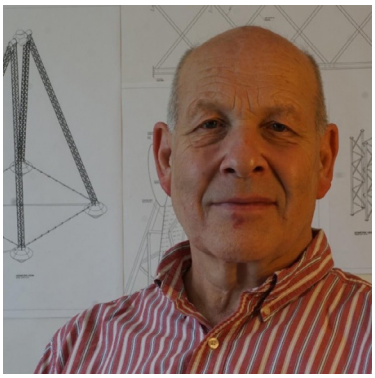
T-Omega Wind Inc. (TOW) completed successful wave tank testing with a 1:60 scale prototype of its floating offshore wind turbine.

T-Omega Wind Inc. (TOW) completed successful wave tank testing with a 1:60 scale prototype of its floating offshore wind turbine – which, at full scale, weighs less than 100 tons per MW. The next generation TOW turbine rode over scale-adjusted wave heights of 3m, 12m, 18m, and an extreme rogue wave of 30m (98 feet). These tests were performed in July 2022 at the University of Strathclyde in Glasgow, Scotland – shortly before the TOW team announced their National Science Foundation STTR grant.

“The Kelvin Hydrodynamics Laboratory (KHL) performed a model scale hydrodynamics test of a 10MW floating wind turbine for T-Omega Wind. This is the lightest 1 to 60th scaled floating wind model I have ever tested since I joined the laboratory. With a designed full-scale mass to power ratio under 100 tons per megawatt, and a full-scale draft less than 5 meters, the model successfully rode a storm sea state with an equivalent full-scale significant wave height of 18 meters. A 30-meter full-scale equivalent maximum wave height was observed within that storm sea state, and it was pushing the upper limit of our wavemakers.

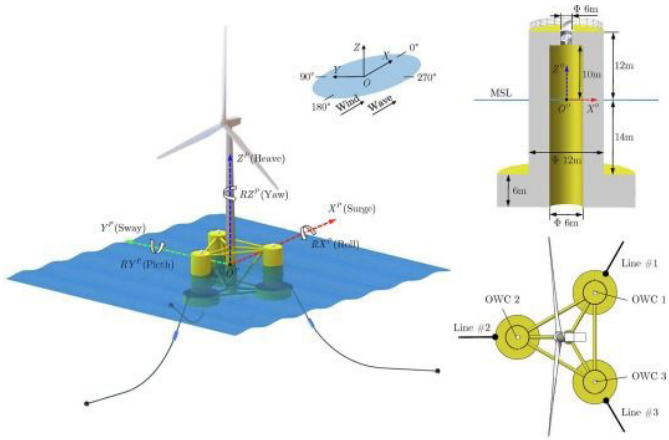
Together with the project principal investigator Prof Maurizio Collu, and the head of the department Prof Feargal Brennan, we are pleased and excited to be involved in evaluating this novel disruptive offshore-wind technology. We wish T-Omega Wind well in its exciting development, and we also encourage other offshore wind innovators to evaluate their concepts with us. “ -- Dr. Saishuai Dai, Project Manager of KHL under the department of Naval Architecture, Ocean and Marine Engineering of the University of Strathclyde.

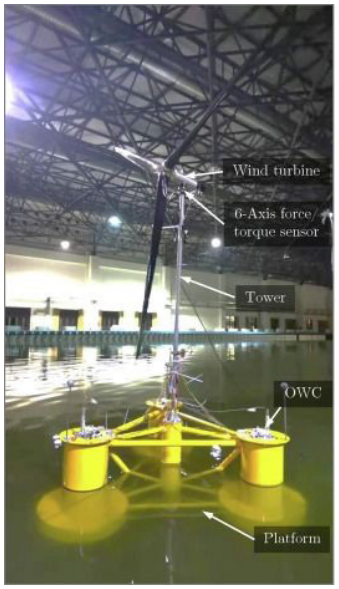
Jim Papadopoulos (PhD MIT), Co-Founder and Chief Engineer at TOW added: “This testing was a high point of my year! Everyone who sees our design has had questions about wave behavior, and these high-precision trials put those doubts to rest. 30m waves are just about the largest storm waves found in any ocean. In our goal to democratize offshore wind, we designed TOW turbines, unlike conventional ocean wind turbines. TOW uses multiple lightweight towers in an efficient pyramid layout – which eliminates 80% of the underwater weight required by other designs. This lowers cost, eases towing, reduces the needed steel thickness, and can be used in depths from 20m to 2,500m. Once certified, we’ll be a dominant technology for offshore wind, and ready to compete for US & international wind farm orders – all while supporting local jobs.”

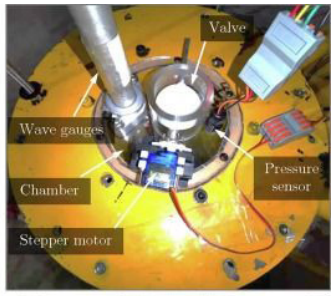


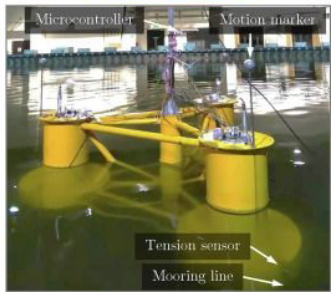
Energy Conversion and Management
Volume 267, 1 September 2022, 115933

A COUPLED NUMERICAL FRAMEWORK FOR HYBRID FLOATING OFFSHORE WIND TURBINE & OSCILLATING WATER COLUMN WAVE ENERGY CONVERTERS









Abstract

Integrating floating offshore wind turbines with oscillating-water-column wave energy converters has been seen as a promising solution for hybrid offshore renewable energy production, as the cost-effective wave energy devices could possibly help increase the overall power absorption, reduce platform dynamic responses, and mitigate loads for critical wind turbine structures etc. As most existing research works on dynamic analysis of these hybrid concepts are based on frequency-domain simulations or scale model experiments, this work focuses on establishing an aero-hydro-elastic-servo-mooring coupled numerical framework for integrated time-domain dynamic analysis. In particular, the water column dynamics are characterised based on an equivalent virtual oscillating body approach so that the time-domain analysis capability for oscillating-water-columns with power take-off control is enabled. For validation, a novel combined concept is designed, and its time-domain numerical results under various environmental conditions have been compared against the 1:50 scale model wave basin test data. Good agreement has been observed between the numerical and experimental results, demonstrating the feasibility of the proposed numerical framework. Furthermore, different power take-off control strategies for the oscillating-water-column wave energy converters have been proposed, and it is found that the designed gain-scheduling control schemes are more beneficial for mitigating the platform motion responses and wind turbine structural loads compared with traditional linear damping control, resulting in 15% platform pitch motion mitigation and 6% tower base fatigue load reduction. Further studies on multi-objective optimal power take-off control design regarding both load reduction and power maximisation could be conducted for hybrid energy platforms based on the established numerical framework.

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SPS SUPPLY AND DISTRIBUTE THE HIGH STRENGTH, LOW TEMPERATURE STEEL USED IN THE OFFSHORE ENEREGY INDUSTRY

Offered as plate and sections to the exacting requirements both in terms of product and quality assurance, required by todays ever demanding industry. All material is manufactured by globally reputable steel mills, rolled to industry standard or bespoke specifications as required.

Our stock range of offshore, marine and high strength structural grades in plates, sections and tubes, together with our relationships with mainstream European producers ensures that we are ideally placed to provide all steel requirements from project start-up to completion.

Our experienced and knowledgeable team are on hand to give further help and advice, please do not hesitate to contact us.

PHOTOGRAPHE OFFSHORE
CHRISTOPHE BEYSSIER

OFFSHORE PHOTOGRAPHER

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

photographers specialize in industry, but the offshore environment has more requirements in terms of risk management. All personnel who need to access sites, whether by CTV or helicopter, must be trained in the inherent dangers. This is of course also the case for photographers.

From exiting a helicopter that has landed on the water, to evacuating a smoky wind turbine from the outside of the mast, OPITO (opito.com) and GWO (globalwindsafety.org) have created training standards to prepare personnel for these eventualities.

The industry is reinventing the world of tomorrow with marine renewable energy.

Offshore photographers document these historic moments.

After providing your company's HSE managers with the necessary certificates to access the sites, the photographer will focus on creating images, safely.

To find your offshore photographer:

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- Photographer – France
- www.photographe-offshore.com
- To work with me : cbeyssier.photography@gmail.com
- Whatsapp : +33(0)6 11 97 56 50

BORKUM RIFFGRUND ONE

Offshore Wind Farm

Country **Germany**	FoundationType **Various**
Farm Capacity **312 MW**	Turbine Type **SWT-4.0-120**
Full Commissioning **9-Oct-15**	Owner **Ørsted A/S**

ZHEJIANG ENERGY · DONG energy · CTG · VATTENFALL · REPSOL · DEME · Dominion Energy · RWE · Shell ENERGY · SCOTTISHPOWER RENEWABLES · EDF ENERGY · EnBW · Eneco · BW ideol · equinor · Principle Power Globalizing floating wind · Statoil · GEC · KOEN KOREA SOUTH-EAST POWER CO. · PLOCAN Plataforma Oceánica de Canarias · MHI VESTAS OFFSHORE WIND · NORTHLAND · OW OCEAN WINDS

CORPOWER OCEAN'S C4 WAVE ENERGY CONVERTER COMPLETES DRY TEST PROGRAM

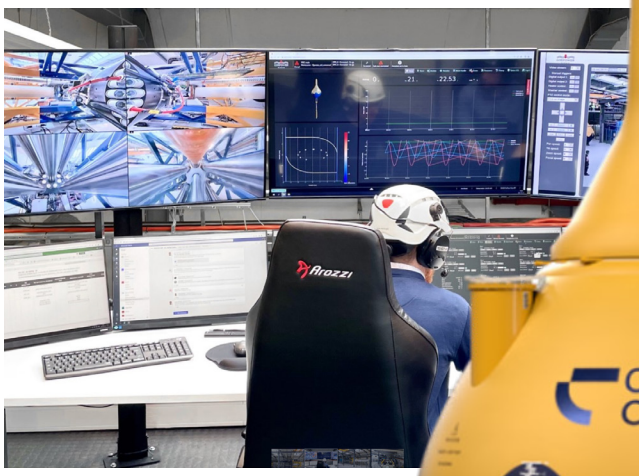
CorPower Ocean's first commercial scale C4 Wave Energy Converter (WEC) has completed a rigorous one-year on-land testing program, following a final 'Ironman' endurance exercise.

The dry test campaign was performed on a purpose bult test-rig at CorPower Ocean's headquarters in Stockholm, Sweden, where the company has developed the world's largest dry-test facility for Wave Energy Converters.

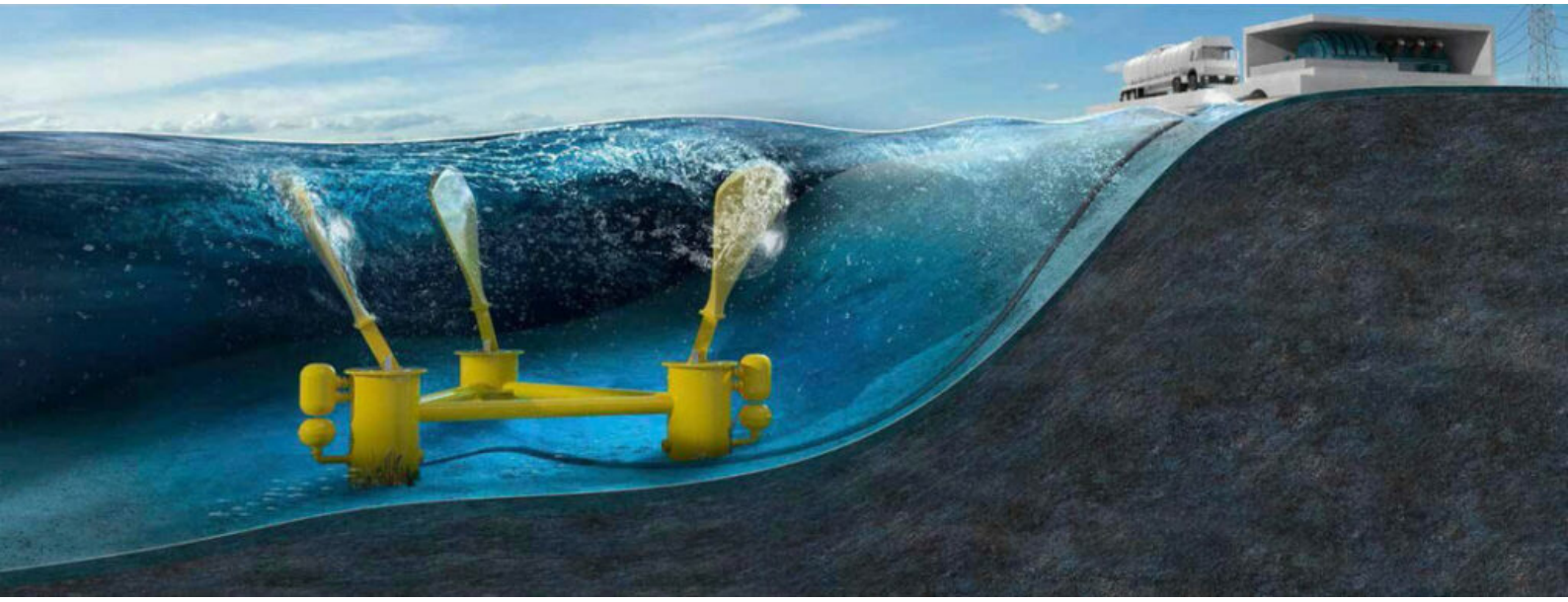
Using simulated wave loading from the 7.2MW test rig, the C4 device has been tested in conditions representing several ocean sites around the world, culminating with a final 'Ironman' phase involving continuous operation and exposure to full range storm loading.

CorPower Ocean Director of Integration & Test, Jean-Michel Chauvet said the device was placed under significant duress beyond levels expected in the field of operation, in order to prove its durability and resistance to loads, vibrations and thermal stress. All functions were tested including the C4 WEC's unique survival mode designed for robust operation in the harshest ocean conditions involving cyclic loads up to 4MN (400 tonnes).

"The final Ironman test brings to a close a significant chapter in the development of the CorPower C4 – our first commercial scale Wave Energy Converter," said Mr Chauvet. "This has been an intense one-year process to systematically test our technology. Over this period, we have taken a staged and methodical approach to debug, stabilize and fine-tune the C4 device to provide full confidence in the technology ahead of ocean deployment."



EXOWAVE & SEMCO MARITIME FORM STRATEGIC PARTNERSHIP FOR WAVE ENERGY



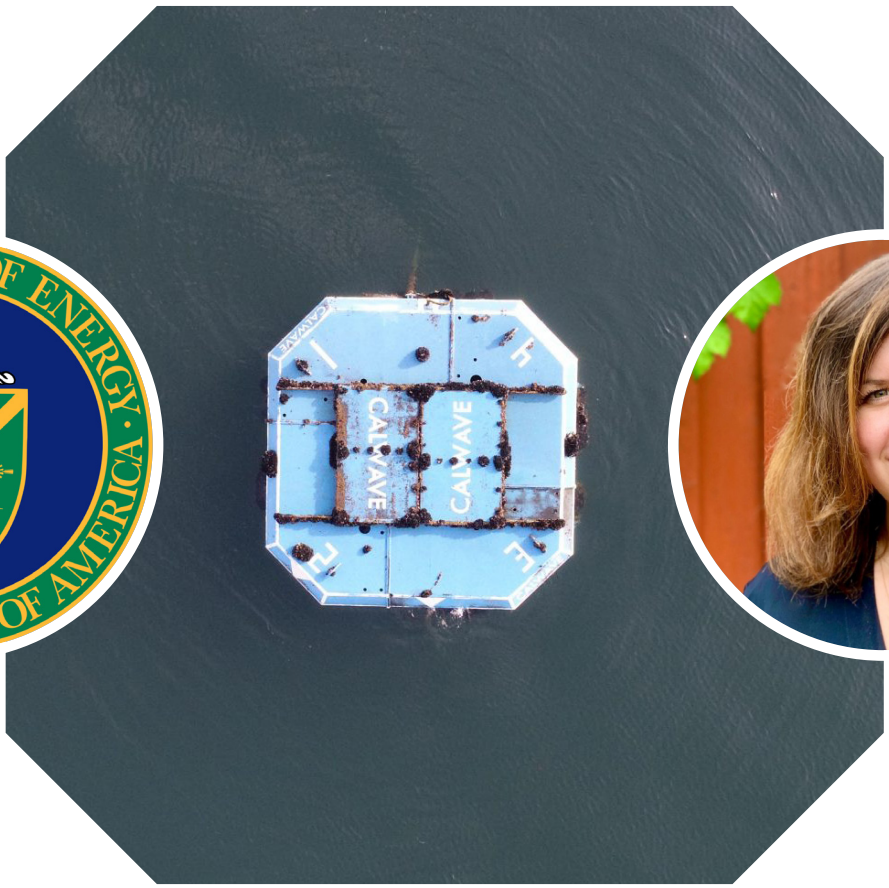
Danish wave energy start-up Exowave has teamed up with international offshore energy services provider Semco Maritime to build the future wave energy sector's value chain.

The partnership will see Semco Maritime providing manufacturing and offshore expertise to Exowave, for the roll out of its wave energy conversion technology in the North Sea at first, and on an international scale moving forward.

Wave energy is seeing a substantial growth over the past years with increasing support from governments. The EU alone has set ambitious targets of 1GW of ocean energy installations by 2030 and 40GW by 2050.

CalWave Power Technologies

CALWAVE SUCCESSFULLY CONCLUDES HISTORIC WAVE ENERGY PILOT IN CALIFORNIA WITH ZERO INTERVENTION AND 99% UPTIME



Oakland, CA – CalWave ("CalWave Power Technologies, Inc."), a leader in wave energy development, has successfully concluded its open-ocean wave energy pilot after 10 months of continuous operation off the coast of San Diego. The project, which deployed in September 2021, was supported by a US Department of Energy (DOE) award with the goal to demonstrate CalWave's scalable and patented xWave™ technology as a cost-effective, sustainable solution for energy generation. Not only does the demonstration represent California's first at-sea, long-duration wave energy project, but it also serves as a critical step toward proving wave power as a commercially viable renewable resource.

The pilot device, named x1™, has now been recovered and decommissioned. Findings will be used to inform CalWave's next grid-connected deployment, scheduled to occur at the federally-approved, 20-MW PacWave wave energy test site off the coast of Newport, Oregon.

Wave energy has been assessed by experts as capable of supplying upwards of a third of global energy demand, yet the development of a viable technology capable of reliably withstanding harsh ocean conditions has been slow to evolve, until now. CalWave's pilot verified its xWave™ system as effective for overcoming the key challenges of performance, reliability, survivability, and cost.

"Marine energy technologies—like CalWave's xWave—hold incredible potential to help transform our energy system in numerous ways, from serving as a resource on our nation's grid to helping remote and coastal communities reduce their reliance on fossil fuels to powering ocean exploration and observation systems," said Jennifer Garson, U.S. Department of Energy's Water Power Technologies Office Director. "CalWave's successful deployment in California marks a critical step in their pathway to commercializing their wave energy system and is an important step forward in the marine energy industry's efforts to demonstrate and deploy these technologies."

WELLO & BIDC SIGN COMMERCIAL AGREEMENT

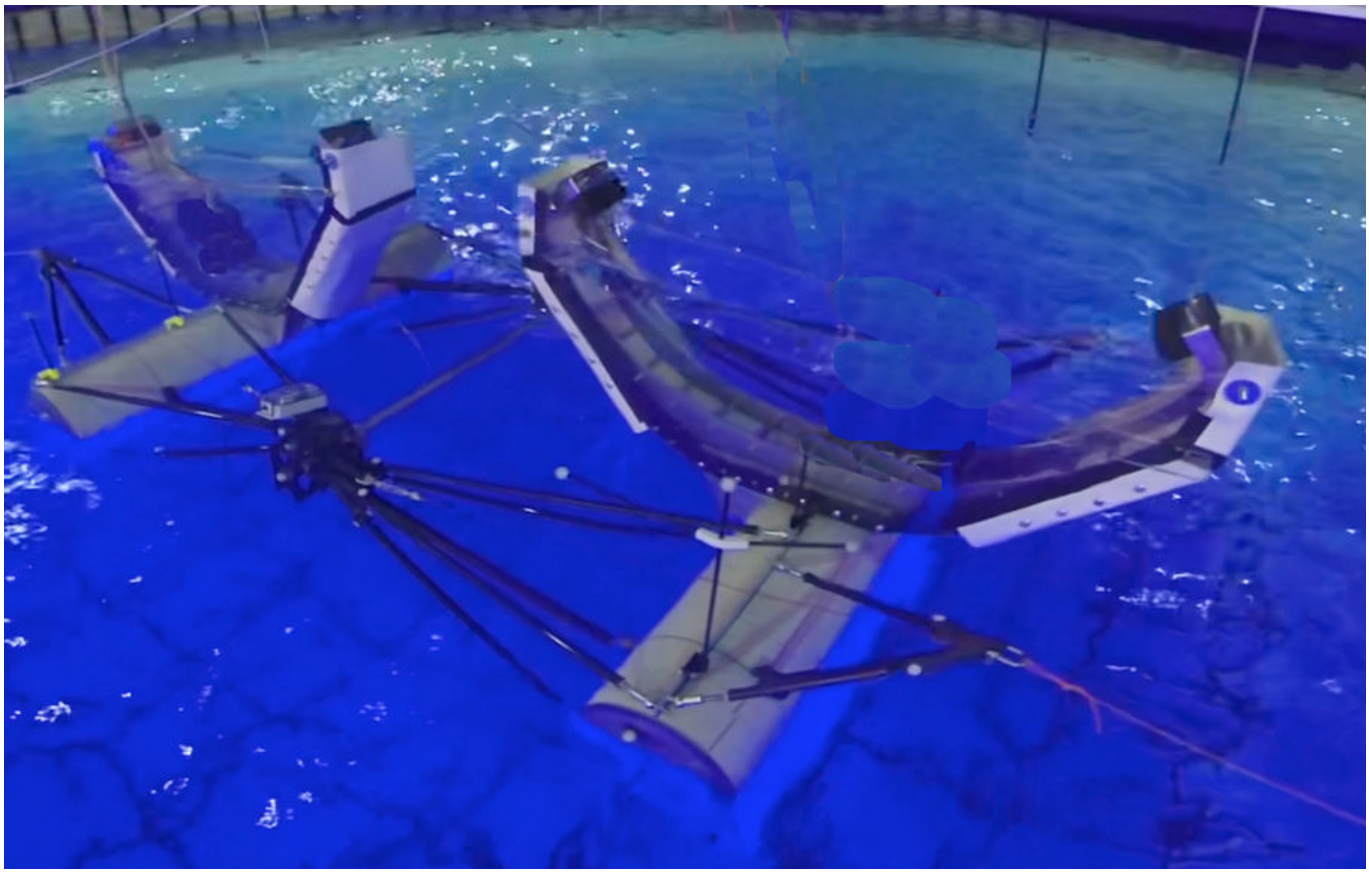
(PENGUIN WAVE ENERGY CONVERTER)

Finnish wave technology provider Wello Oy and the Barbadian Barbados Investment and Development Corporation (BIDC) (now Export Barbados (BIDC)) signed an agreement for deployment of a 5 MW wave energy farm in Barbados.

Export Barbados (BIDC) is an agency of the Barbados Government, whose mandate is to contribute to the diversification and growth of its local economy through new investment, increased exports, and employment creation by fostering the development of competitive business enterprises.

Wello, is a Finnish company with over a decade of experience in wave energy conversion technology. Their unique way of capturing wave energy by their technology, The Penguin, is by way of a floating vessel which captures the waves' rotational power and converts it into clean ocean energy. Wello has already deployed projects in various locations in Europe, in Scotland, the Canary Islands, the Basque country and now the technology will be making its way to the Caribbean.

SUCCESSFUL COMPLETION OF AMOG'S SEA-SAW WAVE ENERGY CONVERTER MODEL TESTING AT FLOWAVE



Amog is pleased to announce the successful completion of model testing of the sea-saw wave energy converter (wec) at the flowave circular tank facility within the university of edinburgh, scotland. The tests took place as part of the europewave pre-commercial procurement (pcp) programme.

The amog sea-saw wec, designed and built at model scale, includes integrated power take off units to enable direct power take off measurements. Amog is pleased to announce that this was one of the most successful power-producing tests to date, and these tests will now underpin our development of a grid scale wave energy converter.

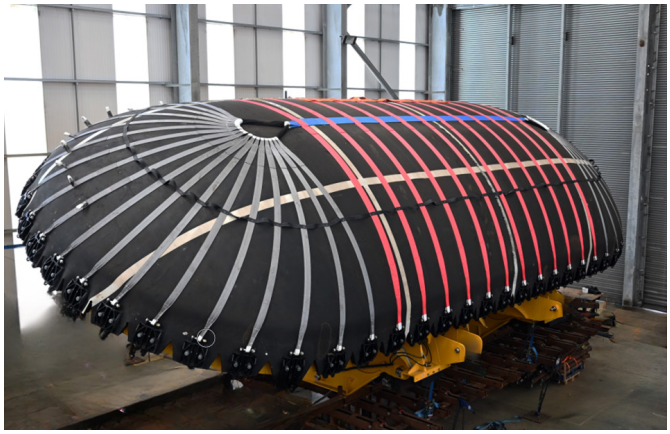
The testing campaign included a series of iec regular wave and irregular wave specification tests, along with robustness checks on quartering conditions.

BOMBORA BEGINS FINAL TEST AND ASSEMBLY OF WORLD'S MOST POWERFUL WAVE ENERGY CONVERTER

Bombora begins final test and assembly of world's most powerful Wave Energy Converter

- Bombora ramps up flagship £20m, 1.5MW Pembrokeshire Project, delivering world's largest Wave Energy Converter
- Final tests underway before ocean deployment
- Technology will be validated in the open ocean advancing mWave to TRL 7/8
- Data will unlock pathway to launch next phase of the InSPIRE Project to deliver large offshore floating wind+wave platforms

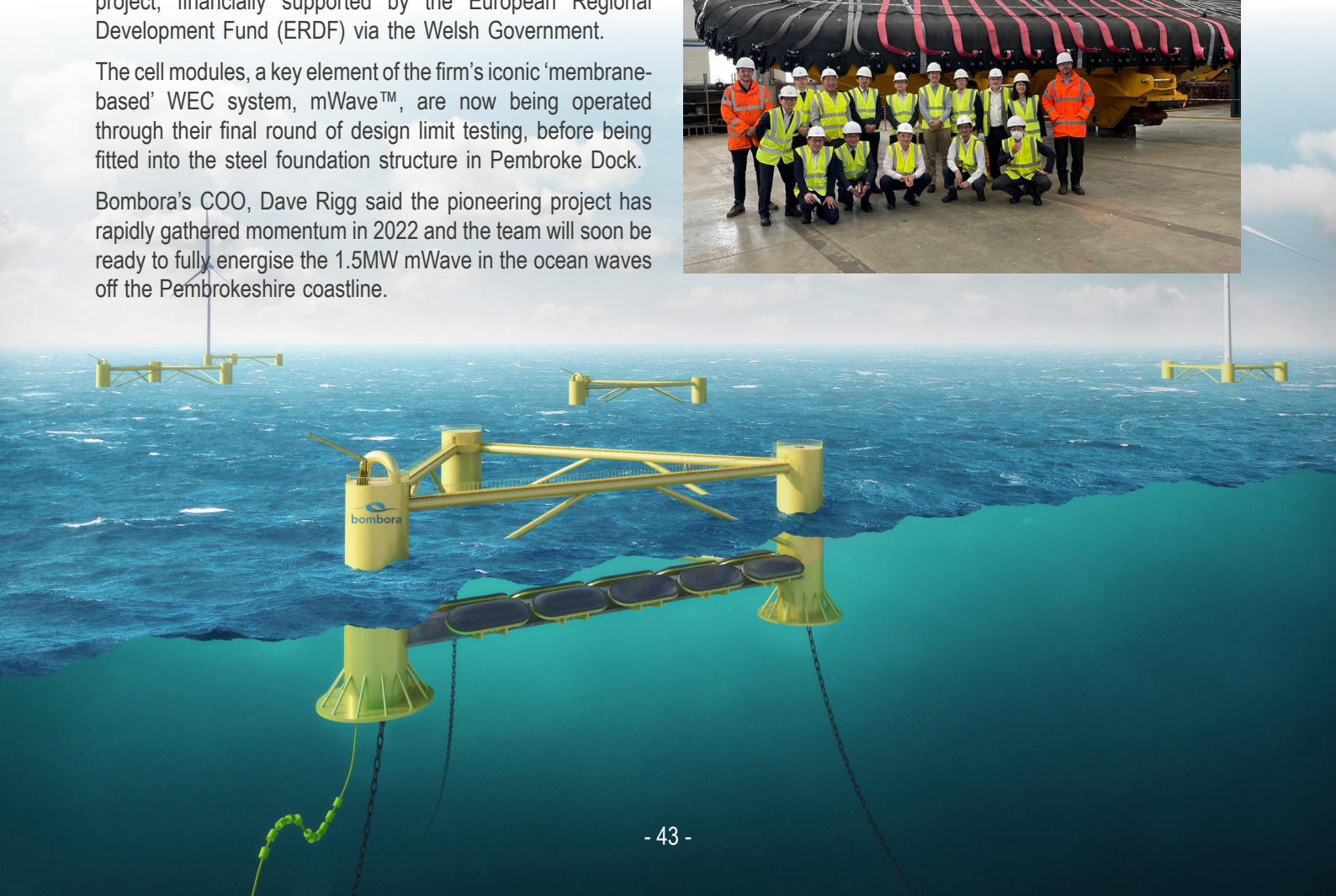
Bombora Wave Power (Bombora) is entering the final test and assembly phase of the ground-breaking 1.5MW Pembrokeshire Demonstration Project, as it prepares to validate the world's most powerful Wave Energy Converter.

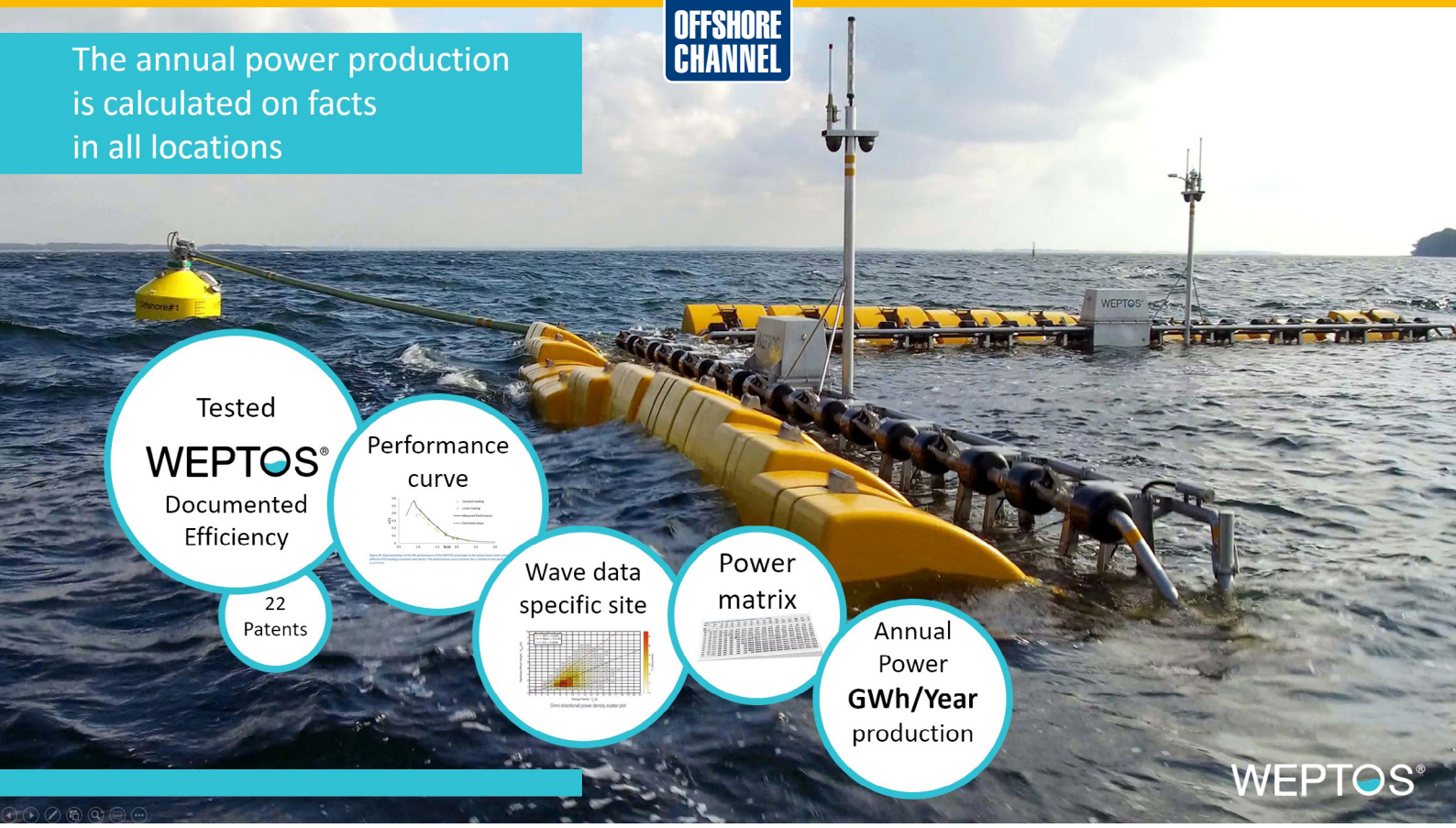


Rigorous testing of the key sub-systems is currently underway as the ocean energy specialist prepares to deliver the £20million project, financially supported by the European Regional Development Fund (ERDF) via the Welsh Government.

The cell modules, a key element of the firm's iconic 'membrane-based' WEC system, mWave™, are now being operated through their final round of design limit testing, before being fitted into the steel foundation structure in Pembroke Dock.

Bombora's COO, Dave Rigg said the pioneering project has rapidly gathered momentum in 2022 and the team will soon be ready to fully energise the 1.5MW mWave in the ocean waves off the Pembrokeshire coastline.




The annual power production is calculated on facts in all locations
Tested
WEPTOS®
Documented Efficiency
22 Patents
Performance curve
Wave data specific site
Power matrix
Annual Power
GWh/Year
production
WEPTOS®

SIGMA ENERGY DEPLOYS FULL-SCALE WAVE ENERGY PROTOTYPE OFFSHORE MONTENEGRO

Slovenia-based company Sigma Energija (Sigma Energy) has deployed a full-scale wave energy device offshore the city of Bar in Montenegro.

After two and a half years of intensive development, Sigma Energy deployed its full-scale 30kW wave energy device at its site in the Adriatic Sea.

Deployed in mid-July 2022, the company's first full-scale prototype has already shown 'extremely promising results', according to Sigma Energy.

Over the years, Sigma Energy has been developing a novel type of wave energy converter, dubbed Sigma WEC, which is a point absorber type of a wave power plant that transforms the wave-induced vertical motion of the circular floating buoy into the electric energy.

Sigma Energy has also developed and implemented its proprietary mechanical power take-off (PTO) system, with inertial unidirectional clutches, which are said to be able to smooth the rotation of the generator and increase its efficiency.

Minesto

MINESTO STARTS COMMISSIONING OF SECOND "DRAGON 4" TIDAL ENERGY POWER PLANT

The second Dragon Class tidal energy power plant "Dragon 4" has now arrived at Minesto's grid-connected site in Vestmanna, Faroe Islands. This power plant commissioning has now commenced, and it will greatly benefit from previous configuration testing executed with the first unit.

"As we are now commissioning the second "Dragon 4" unit, it's with vital experience of cost-efficient onshore and offshore operations. In Vestmanna, we have created a flexible setup, where a small team can assemble and launch the kite in a few hours, practically in all tidal conditions. This operating methodology can be transferred to any location," says Dr Martin Edlund, CEO of Minesto.

"At first glance, the two "Dragon 4" kites look identical, though a few upgrades have been implemented as part of the product development process. It's only three months between the installation of these two units, and it is satisfying to note that this short period is sufficient time to assess, decide, install, and test upgrades prior to delivery. This also underlines the fabrication friendliness of our technology," says Bernt Erik Westre, CTO of Minesto.

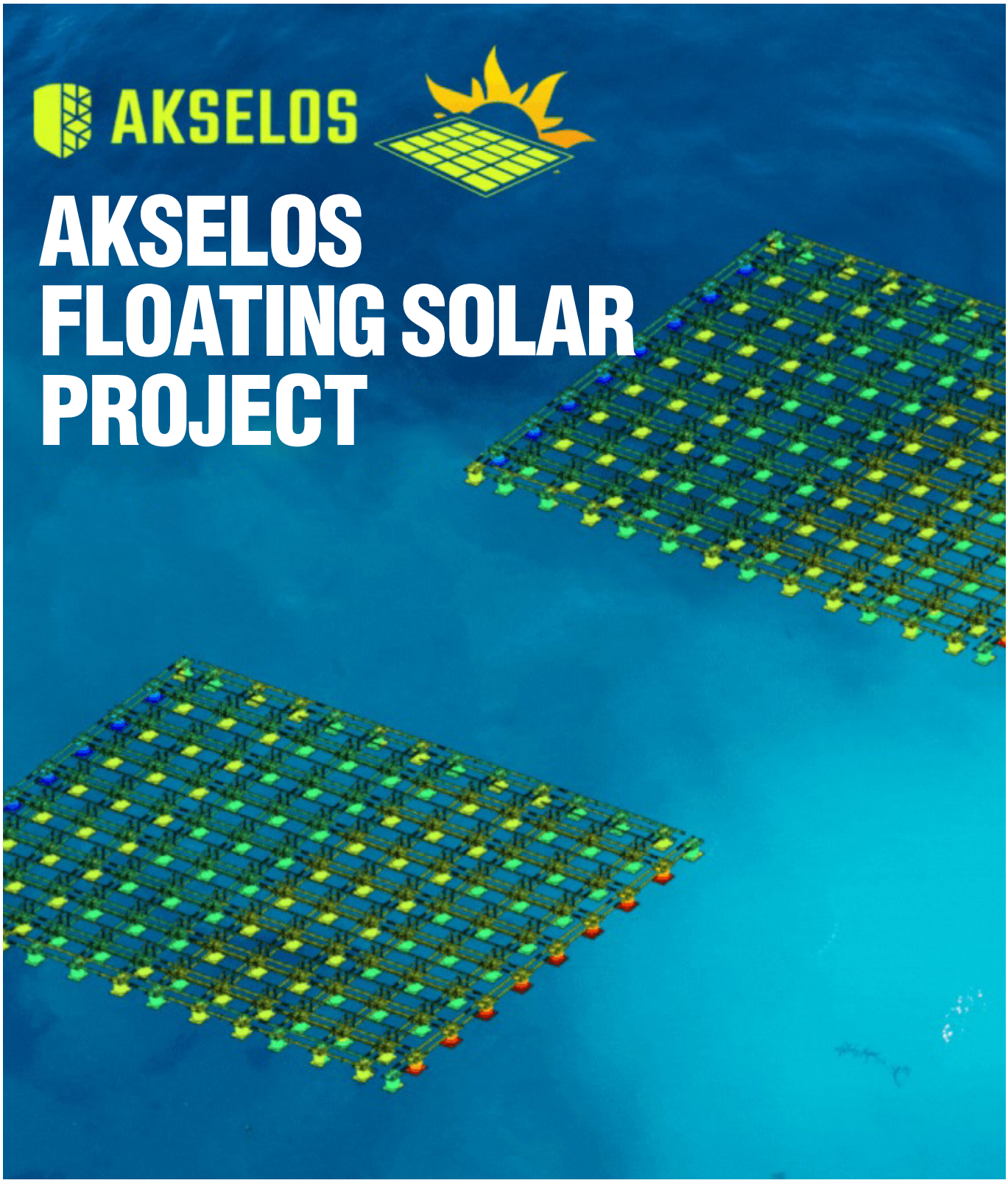
RWE & SOLARDUCK ACCELERATE TECHNOLOGY DEVELOPMENT & COMMERCIALISATION OF OFFSHORE FLOATING SOLAR AT SCALE

- RWE invests in the deployment of SolarDuck's full-scale offshore pilot in the North Sea
- SolarDuck was selected as exclusive provider for offshore floating solar technology with integrated storage in RWE´s bid for the offshore wind farm Hollandse Kust West, Netherlands
- RWE and SolarDuck agree to explore and develop offshore floating solar parks globally

RWE and the Dutch-Norwegian company SolarDuck signed a collaboration agreement to develop the use of floating solar parks at sea. To accelerate the learnings on SolarDuck's floating solar technology, RWE will invest in a first offshore pilot in the North Sea. The project is a first step in the collaboration and lays the foundation for a larger demonstration project at the Dutch offshore wind farm Hollandse Kust West (HKW). RWE is tendering for this project, and has included SolarDuck into its bid with a highly innovative combination of offshore floating solar with integrated storage solutions.

INSEANERGY WILL BE DEVELOPING & DELIVERING ZERO-EMISSION SYSTEMS WHICH MAKE FISH FARMS SELF-SUFFICIENT IN ENERGY

Inseanergy currently delivers green energy to the aquaculture sector with the aid of floating solar panels installed on recycled fish cages. In cooperation with our customers and expertise networks, we will be developing and delivering zero-emission systems over the next three years which make fish farms self-sufficient in energy. Together with the aquaculture industry, we are taking a green leadership in both shifting to a circular economy and restricting greenhouse gas emissions.



Floating solar is an innovative renewable energy solution to the energy and climate crises we face. It is an entirely renewable source, does take up valuable space on land and can be hooked up to existing links to the power grid when used on offshore fields.

The technology is taking off globally. In India, Amp Energy India has signed a Power Purchase Agreement with Rewa Ultra Mega Solar Limited to build the world's largest floating solar project. In Europe, EDP created Europe's largest floating solar park in Portugal in July, and energy firm RWE is investing in a pilot project to deploy floating solar technology in the NorthSea.

is also active in the floating solar field, which aligns with their goal to help drive the transition to netzero emissions by 2050. Akselos are currently collaborating with a major Korean Engineering & Construction Company to deploy a Digital Twin for floating solar for the first time.

KING WILLEM ALEXANDER WILL VISIT THE OCEANS OF ENERGY OFFSHORE SOLAR FARM SYSTEM IN AUGUST

On Thursday 25 August, His Majesty the King will pay a working visit to various locations in the North Sea where the future of the energy system is being worked on, with wind, sun and green hydrogen.

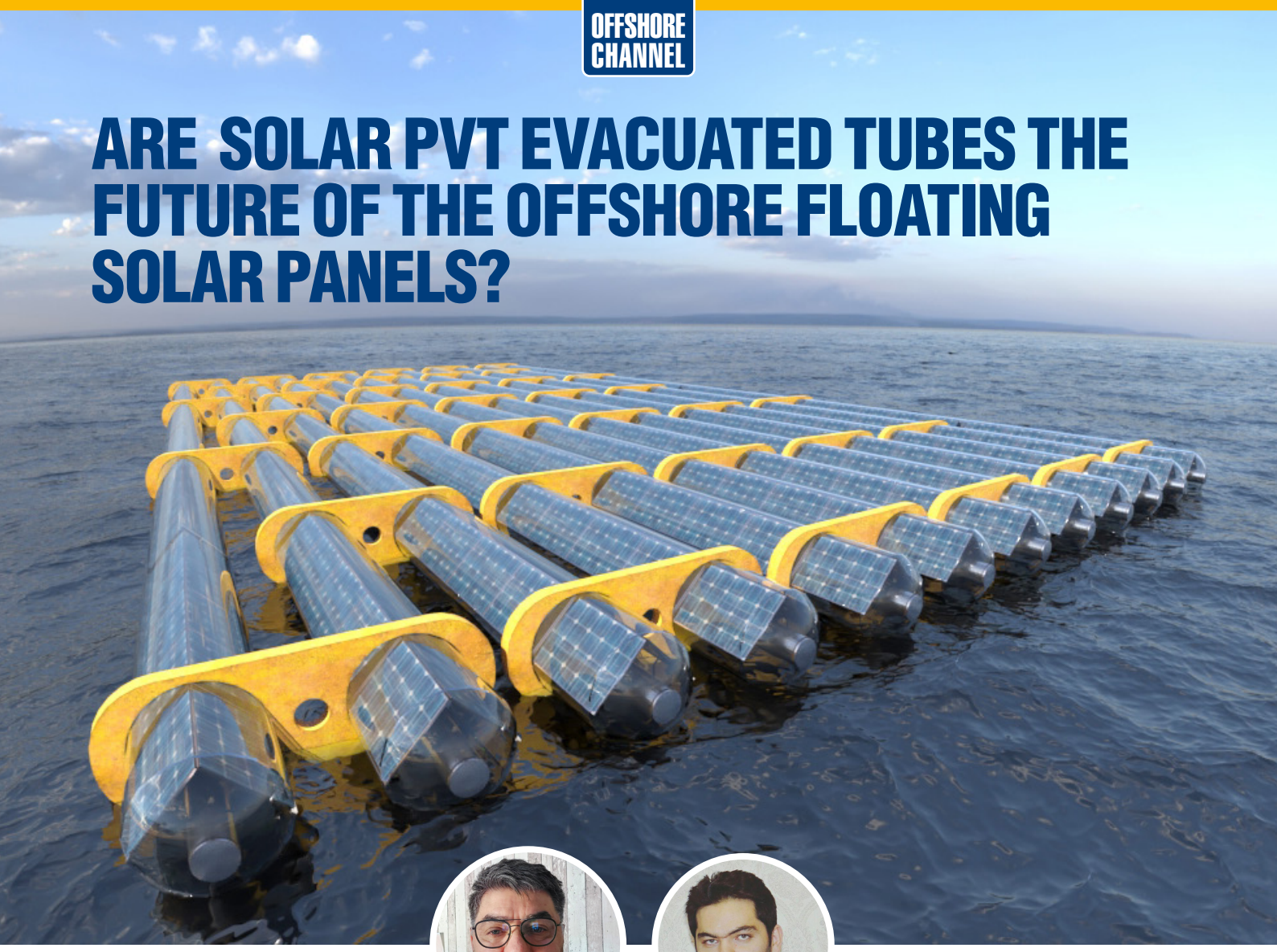
The energy transition must ensure that the energy system is almost completely CO2 neutral by 2050. The energy system of the future is a mix of electrons and molecules. Sustainable electricity and green hydrogen play an important role in this. The North Sea is also an important location in this regard.

The working visit starts at one of TenneT's transformer platforms of the Net op Zee project Hollandse Kust (zuid)*. This so-called offshore socket transports the electricity generated in the wind farm of the same name to land. The wind farm, which is currently being built by Vattenfall and owned by Vattenfall, BASF and Allianz, will also be visited afterwards.

Next, the Q13a-A platform of Neptune Energy will be visited*, where the green hydrogen pilot PosHYdon is in preparation. TNO is involved in this as one of the partners. In this pilot, offshore wind, offshoregas and green hydrogen integrated. The green hydrogen is transported to land via an existing pipeline. The lessons learned here could accelerate the further rollout of the energy system of the future.

During the boat trip, you will also sail past the Oceans of Energy pilot project , where floating solar panels are tested. The Netherlands does not have enough suitable space on land to use the energy from the sun that is needed for our future energy mix. This test is a step towards a large-scale rollout at sea.

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.

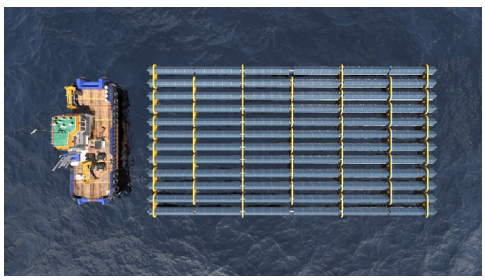
The round shape reduces the possible snow load. Wind and waves have less attack surface. Thus, many photovoltaic projects can from a static point of view with classic modules on land and on water realized only at high cost.

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



FIDAR OFFSHORE MINIATURE MODEL'S

Fidar Offshore Miniature Model's company is a global e-commerce business founded 20 years ago serving both the corporate and private sectors with our growing range of different services. Our current offering includes ready-made offshore vessel models, model boat kits, display cases, model restoration, 3D printing, rendering, and any type of offshore equipment miniature models.

Amir Cheraghpour
Managing Director

FIDAR OFFSHORE ANIMATION COMPANY

FIDAR
Offshore Animation

Fidar Offshore Animation Company is ready to advertise your company with the best quality and the lowest price. In fact, we are a young and creative team that specializes in producing industrial animation (Offshore Energy Sector), Architectural animation, motion graphics and web design. The Fidar Offshore Animation works in the business world with the message “Pay less, Get the best”.

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