

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.



‘GREEN JADE’ COMPLETES FIRST ASSIGNMENT IN TAIWAN

DEME’s offshore installation vessel Green Jade completed its first heavy-lift installation assignment in Taiwan by installing the 31st and final jacket foundation at the Zhong Neng wind farm. Utilising its 4,000-tonne capacity crane, Green Jade played a crucial role in achieving this significant milestone.

This installation follows the earlier completion of the placement of 93 pin piles using its jack-up vessel, Apollo.

Located offshore Changhua, the 300 MW Zhong Neng project is one of Taiwan’s first locally developed landmark wind farms. CDWE, the Taiwanese joint venture between CSBC and DEME, completed the foundation installation on schedule. This achievement keeps the project on track to be the first in Taiwan delivered according to the original timeline, meeting all established milestones.

The completion of the project is attributed to the collaborative efforts and open communication between CDWE’s local engineers, DEME’s European technical team, and the client, Zhong Neng.

COSCO DELIVERS MORAY WEST TRANSITION PIECES

COSCO Shipping Heavy Transport has handled 10 transition pieces on behalf of Lamprell for the Moray West offshore wind farm project.

Lamprell was awarded the fabrication and transportation contract for a total of 62 transition pieces for the offshore wind farm. 10 of those units were loaded onboard COSCO Shipping Heavy Transport's vessel Tai An Kou in an upright position for delivery from Hamriyah in the UAE towards the marshalling yard in Nigg, UK.

Global Energy Group's (GEG) port of Nigg in the Cromarty Firth was selected by Ocean Winds as the marshalling location for the transition pieces towards the end of last year. In addition to the transition pieces, Siemens Gamesa selected the port for the wind turbine marshalling and pre-assembly work for the project.



NMS-T-10000 STANDS READY FOR ITS VOYAGE TO THE 'HE DREIHT' OFFSHORE WIND FARM

After a construction period spanning 16 months, the NMS-T-10000 was loaded out onto a barge on March 22nd, preparing it for transportation to the EnBW He Dreiht offshore wind farm. This project set sail over two years ago, initiating with the engineering phase and culminating in the recent completion of the FAT (Factory Acceptance Test).

The NMS-T-10000, distinguished as the largest noise mitigation system in the world, builds upon the successes of its predecessors, the NMS-8000 and NMS-8800. These predecessors are renowned for their best-in-class underwater noise mitigation technology.

This NMS-T-10000 showcases remarkable capabilities essential for its task:

- Designed for use from a floating vessel
- Capable of handling monopiles with diameters of up to 10 meters
- Maintains monopiles in a vertical position and accurately rotates them to the correct heading
- Noise from pile to water is almost completely blocked, minimizing environmental impact
- Equipped with six mudmats for precise alignment and stability during installation
- Effective operation in water depths of up to 42 meters

During the installation process at He Dreiht, Heerema Marine Contractors, the owner and contractor, will also utilize our IQ6 Hydrohammer® (the world's most powerful hydraulic hammer), PULSE®, an 8-meter pile sleeve, and related supporting equipment.

With the NMS-T-10000 now being readied for its voyage to its designated site, let us commemorate this collective achievement, extending special appreciation to IQIP's project team.

He Dreiht stands as one of Europe's largest planned offshore wind power projects, and will be able to supply renewable energy to 1.1 million households.

NOISE MITIGATION





Sarens' Engineered Transport of jackets totalling over 78.000T, destined for Norway's NeartNaGaoithe Offshore Wind Farm, was a demonstration of our immense Engineering and Logistics capabilities.







SEATWIRL SIGNS MOU WITH VERLUME

SeaTwirl announces today on March 25, that an MoU has been signed between SeaTwirl and UK-based offshore intelligent energy management and energy storage specialist firm Verlume, to collaborate around electrification of offshore assets and decarbonization of the oil and gas industry.

SeaTwirl and Verlume Ltd. have entered an MoU with the purpose of identifying and pursuing potential opportunities to work together on the decarbonization of offshore oil and gas and other associated offshore electrification opportunities, using renewable power and seabed based energy storage and intelligent energy management. The aim is to enable commercial sales of bespoke systems using the companies' combined technologies as a solution.

“This MoU is a significant step forward for the decarbonization of the offshore oil and gas industry and we are looking forward to beginning this collaborative working relationship with SeaTwirl. As a company, we have designed our subsea energy storage systems to be agnostic to any renewable power input and we believe that through integration with SeaTwirl’s unique floating wind power technology, we will jointly be able to provide large capacity systems for clean power delivery across a range of assets and use cases in the subsea environment.” Richard Knox, CEO, Verlume.

“We are excited to enter this MoU with an established partner like Verlume, a well-known brand in the offshore electrification market. I am convinced that our combined capabilities and technologies will push forward the decarbonization of remote assets and prove that the hard-to-abate emissions can be reduced through new technology. At SeaTwirl, we look forward to continuing to develop this market through this MoU and to expand the possibilities of renewable offshore energy solutions.” Johan Sandberg, CEO SeaTwirl.

About Verlume

Verlume is a leader in intelligent energy management and storage technologies for the energy industry. Established in 2013, Verlume has been a front-runner in the energy transition for over a decade, providing a suite of products based on their core technologies of intelligent energy management and storage. With a track record of firsts, Verlume consistently deliver world-class technology and projects to the energy market – reinventing traditional systems by decarbonizing operations, reducing carbon footprint, and maximizing efficiency.





Hull Trim System: Maximize value for floating wind projects

Inês Serras Pereira

Principle Power

The 4th generation WindFloat® portfolio is a structurally efficient, three-column semi-submersible floating platform product line that combines a unique set of features to provide unparalleled performance in the harshest environments.

The smart hull trim system adapts to metocean conditions by shifting water ballast between columns to keep the wind turbine tower at vertical, maximizing output and minimizing loads.

FLOATING PYRAMIDS COULD MAKE FOR CHEAPER WIND POWER



Standard piles driven into the seabed require specialized ships. A new design rides the waves to make offshore wind farms easier to build.

Sometimes the answer to a large, complex problem is floating right in front of us. That certainly could be the case for offshore wind power. Companies working to build offshore wind farms have been bedeviled by costs involved in anchoring skyscraper-size towers on the seabed and designing active controls for steering the blades into the best position to capture power.

According to engineers at a Boston-based startup, the solution may be as simple as building pyramid-shaped support structures that float in the water and passively orient themselves to face the wind. Anchored by a few mooring lines, much like a buoy in the sea, these turbines can withstand harsh weather and huge waves, making them an ideal alternative to the fixed bottom monopile wind turbines that have been implemented thus far.

“With this design, we set out to embrace the inevitable motion of being offshore,” explained Vin Loccisano, chief operating officer at T-Omega Wind. “We designed the entire structure with the assumption that it is going to move, it’s going to ride over waves, and we will just have to engineer our way out of any problems that ensue. We found that those problems are quite manageable.”

Due to the strong and steady winds found over ocean waters, experts consider offshore wind to be a promising source of renewable power. According to the Global Wind Energy Council, more than 64.3 gigawatts of global offshore wind capacity was in operation by the end of 2022, accounting for 7.1 percent of global wind power installation.

Become an ASME member

The main benefit of a floating turbine is that it takes out massive amounts of steel from the system. The floating turbine can also function in much deeper depths, making it versatile for countries that want to implement offshore wind but don’t have the appropriate depths at their coastlines.

The T-Omega design was built “from the water up” and includes a three-bladed, horizontal axis rotor that spins between two upwind and two downwind legs. The configuration allows the axle to be held at both ends like a bicycle wheel.

There is no active yaw, such as with traditional turbines, but rather the turbine is anchored with a mooring line that provides a small radius to respond to the conditions of the sea. As the wind direction changes, the turbine passively swings to align with the wind.

Each floating pyramid can support turbines capable of generating up to 20 megawatts. They can be clustered together to form wind farms.

As Loccisano explained, the design relies on existing technology to make this a scalable solution.

“There’s no magic in our blades,” he said. “There’s no magic in our generator, or control system, or software. We’re making sound business and engineering decisions to buck the trend.”



AXESS TECHNOLOGIES SECURES CONCEPT ENGINEERING STUDY CONTRACT WITH WIND CATCHING SYSTEMS

axess Technologies has won a concept engineering study contract with Wind Catching Systems (WCS), a developer of floating offshore wind technology.

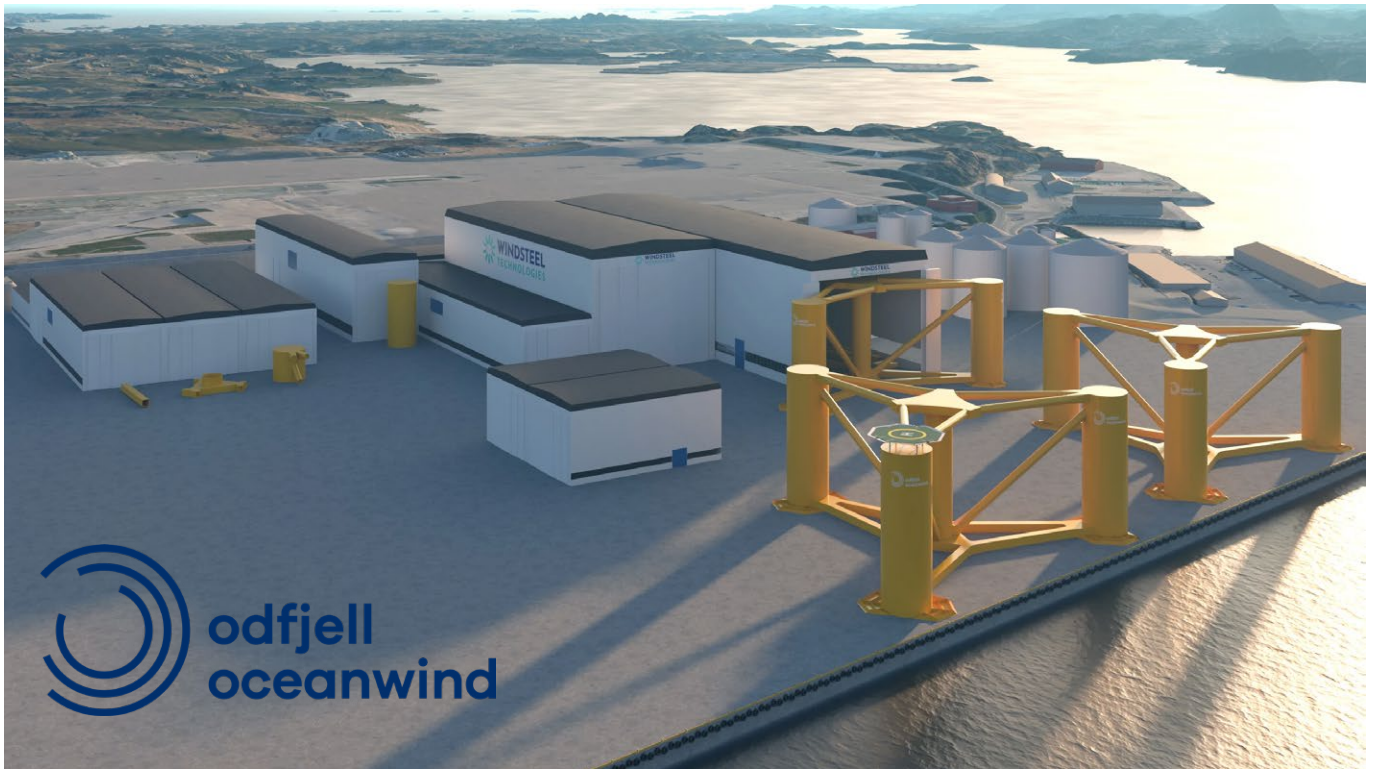
The scope of work entails an advanced handling system capable of efficiently replacing turbine blades and entire turbines, while also serving as a versatile work platform for inspection, maintenance and repair operations.

“Securing the project was a result of our vast practical experience in executing lifting operations, operating lifting appliances and conducting maintenance, along with a comprehensive understanding of rules and regulations. We are enthusiastic about leveraging our expertise in material handling to actualise this innovative and sustainable system for WCS. This comprehensive study aligns seamlessly with our strategy to enhance revenue streams from renewables, further solidifying our position as a key supplier of lifting solutions to the offshore wind industry,” Marte Vågen, Director – Products at Axess Technologies said.

WCS is an independent technology provider to the floating wind sector, aiming to create a product that maximises power generation from a concentrated area. The Windcatcher is a highly scalable unit, based on mass-produced smaller turbines and at-sea replacement of individual turbines without the use of specialized ships or cranes. The result will be a concept with phenomenal scaling potential, high acreage efficiency and drastically reduced operations and maintenance costs for floating wind.



ODFJELL OCEANWIND ADDRESSES FLOATING WIND BOTTLENECK AND CREATES WINDSTEEL TECHNOLOGIES



Odfjell Oceanwind, together with the leading automation and manufacturing expert Prodtex, have established a joint venture to address what is expected to become one of the biggest bottlenecks in scaling the floating offshore wind industry: low cost and high-capacity manufacturing of foundations for floating wind turbines. The joint venture is created to establish the production capacity necessary to meet the need for hundreds of floating wind foundations per year in Europa alone and is looking to have its first facility operational by 2027. Recently, the industry veteran Geir Bjørkeli, former CEO of Corvus Energy, has been appointed to head up the venture.

Windsteel Technologies develops large factories tailored to deliver floating foundations at the cost, scale and quality required to commercialise floating offshore wind. The company will act as a hub for delivering the foundations to the market and work in close collaboration with specialist companies from the local and international supply chain. The first partners are already in place and more will be added in the coming months and years, preparing for what is expected to be a multibillion-euro market at the end of this decade.

The joint venture is a result of several years of collaboration between Odfjell Oceanwind and Prodtex, where the two companies have jointly developed automated production and assembly methods for Odfjell Oceanwind's market leading

Deepsea floating wind foundations. Windsteel Technologies is established based on a realisation that manufacturing of floating offshore wind foundations will require an approach to industrial production which is different from what exists in the existing supply chain and will therefore require a mindset from automotive and aerospace manufacturing rather than traditional ship building and offshore yards.

"Production of floating wind foundations of the size and scale needed to develop gigawatt floating wind parks will require factories, and not yards like we are used to see from the oil and gas and ship building industries. These factories will be highly specialised with production and assembly lines that are customised to produce foundation designs with relatively similar structural components. Very much like we see in car or aeroplane factories", Per Lund, CEO of Odfjell Oceanwind and chairman of Windsteel Technologies explains. "If floating offshore wind shall become a relevant source of energy in the future, we need to dramatically reduce the costs, but also increase the scale. And we need to do this without sacrificing quality. These offshore structures for wind turbines of 15MW and larger shall be able to withstand extreme loads for more than 30 years without having to be towed back for repairs. Failures based on poor quality welds or surface treatment are simply not acceptable."



Willy Gauttier, Technip Energies
Vice President, Floating Offshore Wind Business Unit

Séverine Baudic, SBM Offshore
Managing Director, New Energies



SBM OFFSHORE AND TECHNIP ENERGIES SIGN A PARTNERSHIP AGREEMENT TO FORM EKWIL, A FLOATING OFFSHORE WIND JOINT VENTURE

- Two global leaders in Floating Offshore Wind join forces to provide new energy solutions
- The combination of proven technologies, engineering know-how and recognized delivery expertise will enhance the confidence in the emerging floating offshore wind market

SBM Offshore and Technip Energies are pleased to announce the signing of a Memorandum of Understanding for the creation of a joint venture entity, EkWiL. The new company will be a Floating Offshore Wind (FOW) pure player, capable of proposing a wide range of solutions to clients.

EkWiL will combine the people expertise, engineering and delivery capabilities, and complementary technologies of Technip Energies and SBM Offshore, creating integrated floating solutions and leading delivery offerings for the Floating Offshore Wind market. This unique positioning will enhance execution certainty and cost competitiveness to these innovative projects.

The 50/50 JV will operate as a fully integrated team, bringing together knowledge, innovation and capacities to develop the

two leading-edge technologies (Semi-submersible INO15 by T.EN™ and Tension Leg Platform Float4Wind®) covering a large spectrum of the Floating Offshore Wind market, and bring them to commercial deployment.

- Bruno Chabas, CEO of SBM Offshore, commented: "Our aim is to become a recognized leading contractor in developing floating offshore wind infrastructures. Collaboration is fundamental to position our ambitions sustainably while managing the pace of infrastructure development and the challenging economics of these pioneering systems. We are pleased to share our experience with the right partner, broadening the range of solutions and reinforcing our energy transition commitment."
- Arnaud Pieton, CEO of Technip Energies, commented: "Joining forces and collaborating are necessary to capture the potential of the nascent floating offshore wind market. By leveraging the synergies of complementary technologies and supply chain experience, EkWiL will increase predictability to meet market demand and deliver on our ambition to provide new energy solutions."



FLOATING OFFSHORE WIND DEMONSTRATION PROGRAMME

The Floating Offshore Wind (FOW) Demonstration Programme is now closed.

BEIS awarded £31.6 million in grant funding for demonstration of innovative floating offshore wind technologies. Eleven projects were funded, covering 4 challenge areas:

1. Dynamic cables
2. Anchorings and moorings
3. Floaters and foundations
4. Industry defined innovation (other technology, not 1, 2 or 3)
5. Integrated demonstration of multiple technologies

Projects will demonstrate an innovative technology in the hope of reducing costs and increasing the rate of deployment of floating offshore wind turbines.

NZIP Grant: £ 3,268,058

Integrated Floating Offshore Wind Demonstrator (INFLOAT)

Led by Copenhagen Offshore Partners
NZIP Grant: £9,656,980

Subsea Substation to FOW Interface assembly demonstrator

Led by Aker Solutions Ltd
NZIP Grant: £690,454

Design, install and test a SENSE equipped wind turbine on a TLP floating foundation

Led by SENSE Wind Ltd
NZIP Grant: £10,000,000

MW scale demonstration of MPS low cost floating foundation system for FOW

Led by Marine Power Systems Ltd
NZIP Grant: £3,466,083

UKCS Floating Wind Accelerator

Led by Cerulean Winds Ltd
NZIP Grant: £825,692



**SOLVE'S INNOVATIVE SOLUTION
ENABLES COST-COMPETITIVE,
SUSTAINABLE, FAST, AND FULLY
INTEGRATED ON-SITE MAJOR
COMPONENT REPLACEMENTS
FOR FIXED-BOTTOM & FLOATING
OFFSHORE WIND TURBINES.**



Solve Wind Services

SOLVE is a joint venture between Esteyco and Liftra. Our combined team consists of highly skilled professionals with extensive experience in the offshore and onshore wind industry. Our in-depth knowledge of the industry enables us to deliver exceptional installation and maintenance solutions, ensuring the highest level of safety, quality, and cost-competitiveness, as demonstrated on numerous completed projects.



MOOREAST

MOOREAST OUTLINES STRATEGIES TO ENHANCE MOORING SOLUTIONS FOR THE FLOATING RENEWABLE ENERGY SECTOR



Mooreast Holdings Ltd announced plans to expand its mooring and rigging solutions product portfolio and to enhance partnerships with international players in order to extend its value proposition to the global floating offshore renewable energy sector.

Mooreast released a Business Update outlining growth strategies outlined its growth strategies following its successful listing on Singapore Exchange (SGX) Catalyst in November 2021.

SEAQUALIZE

WORLD'S FIRST INLINE ACTIVE HEAVE COMPENSATOR SUCCESSFULLY TESTED BY SEAQUALIZE, TOGETHER WITH VAN OORD

In no less than 62 hours of rigorous offshore testing, tech scale-up Seaqualize successfully completed offshore trials for its inline Active Heave Compensator (iAHC), the 'Delta600'. Together with testing partners Van Oord and nautical research institute MARIN, the offshore lifting tool was tested for fixed-to-floating, floating-to-fixed and floating-to-floating transfers of 300mT loads.

The Delta600 is DNV certified and ready for work.





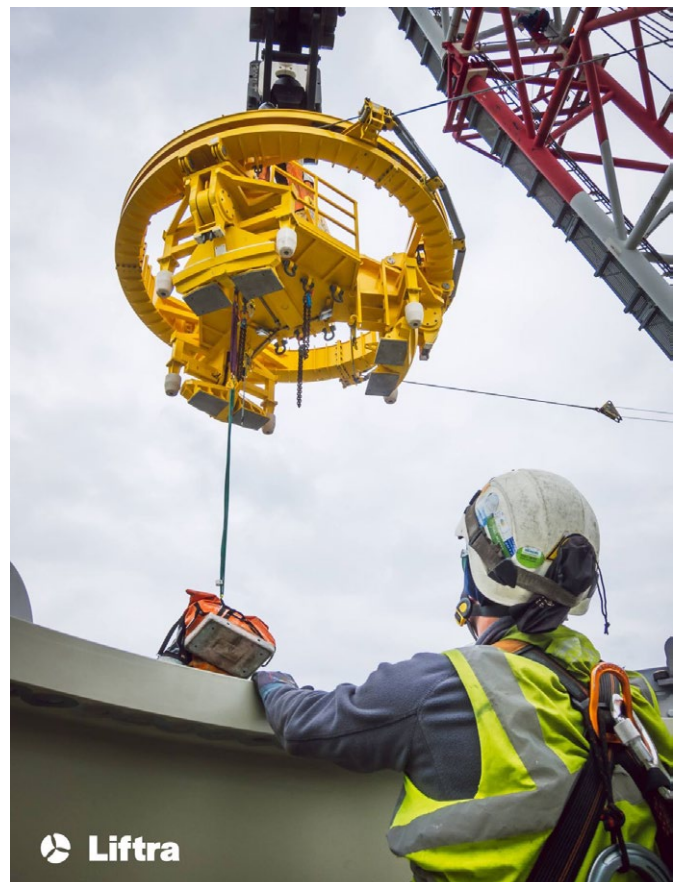
OFFSHORE WIND IS GROWING AT AN INCREDIBLE SPEED, AND HERE AT LIFTRA, WE CONSIDER IT ESSENTIAL TO SUPPORT THE WIND INDUSTRY WITH INNOVATIVE AND SUSTAINABLE EQUIPMENT FOR TIME AND COST-EFFICIENT OPERATIONS.

Liftra provides offshore services and products such as:

- Blade Eagle
- Blade Dragon
- Tower transport systems
- Full tower Lifting Yokes
- Blade Stacking
- Blade Tip clampers
- Rotor yokes
- Liftra Self-Hoisting/Turbine Installation Cranes
- Operational services (e.g. blade yoke and crane operation)
- Engineering services
- Concept studies

Additionally, the upcoming LT1500 Turbine Installation Crane will be deployed offshore for turbine installation and maintenance.

Liftra technology has been applied offshore for more than 10 years. With offshore operations conducted in USA, China and Europe our track record covers more than 700 offshore blade installations and replacements, as well as major component exchanges with the LSHC.





PORT'S AND HARBOUR'S INFRASTRUCTURE REQUIRES A STEP CHANGE IN INVESTMENT TO DEVELOP OFFSHORE FLOATING WIND ON AN INDUSTRIAL SCALE.

Could the W3G Marine floating assembly solution be the answer?

It can assemble any turbine onto any floater with no major port upgrade.

- No compromise of operability for ease of assembly. Developers select the optimal turbine and floater for the entire life of the windfarm.
- Uses conventional technology.
- No requirement to modify any part of the nacelle, tower or floater.
- Static to static lift.
- Safer—onshore tower assembly and commissioning.
- Low cost - low working and standby rates.
- Best use of existing port infrastructure.
- High levels of local content. Avoids cabotage issues.
- Remote operation.
- Does not require a high strength quayside with large laydown area, large crane and deep draught.
- No requirement for a next generation, expensive 'super' jack up.
- Can be scaled to any size
- High volume of throughput - one unit per day possible.
- Powered from shore.

The render created by: Fidar Offshore Animation.





THE ASSEMBLY OF THE TETRAHEDRON CRANE!

Rotterdam-based Tetrahedron company patented, developed and achieved DNVGL design verification on the crane principle and concept design. The Tetrahedron crane is purposely engineered for efficient Wind Turbine Generator installation. Key attention is given to lifting height, capacity at height, lifting radius and jib-clearance. Due to this, a compact Tetrahedron crane model can be used to install today's largest turbines.





LOADING OF MONOPILES ON THE SEMI-SUB "SUN RISE" AT EUROPORT ROSTOCK, GERMANY, HAS BEEN COMPLETED.

The monopiles are heading to Coastal Virginia offshore windfarm in the USA. The seafastening and supporting structures are executed by APT Global Marine & Offshore Engineering in close cooperation with DEME's project team and the ship's crew.





COMING SOON: **NEW MONO-PILE INSTALLATION VESSEL**

New foundation Mono-pile installation tonnage is quickly needed, this part of the offshore wind market is “the most under-ordered segment in offshore wind.” “BALTICA STAR” solutions can accelerate your offshore wind projects worldwide.



Jeroen Berkhout
Project Director at
Offshoretronic



wallaby boats

LAUNCHING OF THE FIRST WB-18 CTV FROM WALLABY BOATS GMBH

World premiere: innovative, suspension ship takes to the water for the first time

With the traditional ceremonial launching lift at Hitzler Werft GmbH in Lauenburg / Elbe on Thursday, March 21, 2024, the new build with the building number WB-18#001 from Wallaby Boats GmbH has now been successfully entrusted to its element and launched into the water. The ceremony was held in a large circle at the Hitzler shipyard, which built the hull in Lauenburg as a production partner in collaboration with Wallaby Boats. The ship, which weighs over 50 tons, was carefully lifted from its building site using two gantry cranes, each with a lifting capacity of 32 tons, "flown" through the shed and placed in the shipyard's own harbour basin.



NEW PARTNERSHIP ENABLES FASTER OFFSHORE WIND INSTALLATIONS IN THE U.S.

Maersk Supply Service to partner with Edison Chouest Offshore (ECO) for the construction and operation of a windfarm feeder concept specifically designed for Maersk Supply Service's next-generation Wind Installation Vessel.

Based on innovative technology, Maersk Supply Service looks to enable steady transfer of turbine components at sea to accelerate the rollout of offshore wind. Maersk Supply Service is already invested in the U.S. Offshore wind market, and partnering with ECO to construct a purpose-built windfarm feeder spread is a natural next step.

"Maersk Supply Service's new installation concept can make offshore wind farm installations significantly faster with estimated efficiency gains of 30%. The partnership with ECO makes this new technology available for the U.S. offshore wind market enabling faster offshore wind installations in the U.S.," says Christian M. Ingerslev, CEO at Maersk Supply Service.

The purpose-built feeder spread includes two tugs and two barges to be delivered in 2026. They will be owned and operated by ECO and constructed by Bollinger Shipyards – the largest privately-owned shipyard group in the United States.

As a key component to the installation process, this newbuild feeder spread will transport wind turbine components or foundations to the installation site, while the wind installation vessel (WIV) remains on location to complete successive installations, allow faster installation, and thereby enable the wind park to be on-grid faster.

"This partnership facilitates expansion of our existing footprint in the U.S. offshore wind industry, and our decades of offshore experience, efficiency and focus on technology can play an important role in the further development of the U.S. offshore wind segment," says Mr. Dino Chouest, Executive Vice President of ECO.

The specialized solution aims to open access to a greater number of U.S. ports logistically. Using U.S.-built, -owned and -flagged tugs and barges to ferry turbine components, Maersk Supply Service's innovative locking and stabilizing mechanism between the WIV and barge will render installations far less dependent on weather conditions, thereby reducing the number of operating days required to install a wind park.



FRIEDE & GOLDMAN BARGERACK SOLUTION RECEIVES APPROVAL IN PRINCIPAL BY DNV GL NOBLE DENTON MARINE WARRANTY SURVEY

Friede & Goldman, a leading engineering and naval architecture firm, is pleased to announce the Approval in Principle (AIP) by DNV GL Noble Denton Marine Warranty Survey (MWS) for its groundbreaking BargeRack solution. This approval marks a significant milestone in the offshore wind industry and underlines Friede & Goldman's continued commitment to offshore energy through innovative solutions, enhanced safety, and operational efficiency.

The BargeRack is a revolutionary solution designed to enhance the efficiency and safety of feeding offshore wind turbines. With Noble Denton marine services' rigorous operability evaluation and certification process focusing on the BargeRack technology, Friede & Goldman's BargeRack has been recognized for meeting the highest standards in safety, reliability, and performance.

Key Features of the BargeRack solution:

- Jones Act Compliant: Promotes the use of the existing Jones Act compliant tug and barge fleet.
- Enhanced Safety: Eliminates hazardous offshore crew transfers, significantly increasing operational safety.
- Efficient Operations: Enables direct lifting of Wind Turbine components from a fixed deck direct to foundation, eliminating redundant handling and streamlining installation processes.
- Innovative Design: Features a state-of-the-art side-mounted configuration with integrated deck skidding system, optimizing space utilization.
- Universal Compatibility: Engineered to accommodate most existing barges without major modifications and allowing for broad retrofit application across the global Wind Turbine Installation Vessel fleet.

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Area industriale- C.da Sasi
91011 Alcamo TP
Phone +39 0924 50 26 55

We lift your ideas

MARINE CRANES
OFFSHORE CRANES
LIFE SAVING CRANES
Man riding and
explosion proof cranes
are qualified to
operate in dangerous
areas and are
designed according
to EN50014.
All the crane
models can be
certified by any
IACS members and
be equipped with
all the optional
depending on
their applications.

Our Product Range

- Hydraulic Foldable-Telescopic-boom cranes
- Hydraulic Elbow Knuckle-boom cranes
- Hydraulic Knuckle-Telescopic boom cranes
- Hydraulic Telescopic boom cranes
- Hydraulic Lattice boom cranes
- Hydraulic A-Frame cranes
- Hydraulic Stiff-boom cranes
- Hydraulic / Electric Davit cranes for
 - *Offshore Wind/O&G applications
 - *Life raft
 - *Provision
 - *Life boat
 - *Fast Rescue boat

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

Offered as plate and sections to the exacting requirements both in terms of product and quality assurance, required by today's 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.





Dan-Bunkering



Our concept Turnkey Fuel Solutions is an end-to-end solution for large scale offshore wind projects. We have a professional team who will be there every step along the way; from the initial stage concerning budgets and planning to the installation of the last wind turbine and the beginning of the maintenance work.

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.



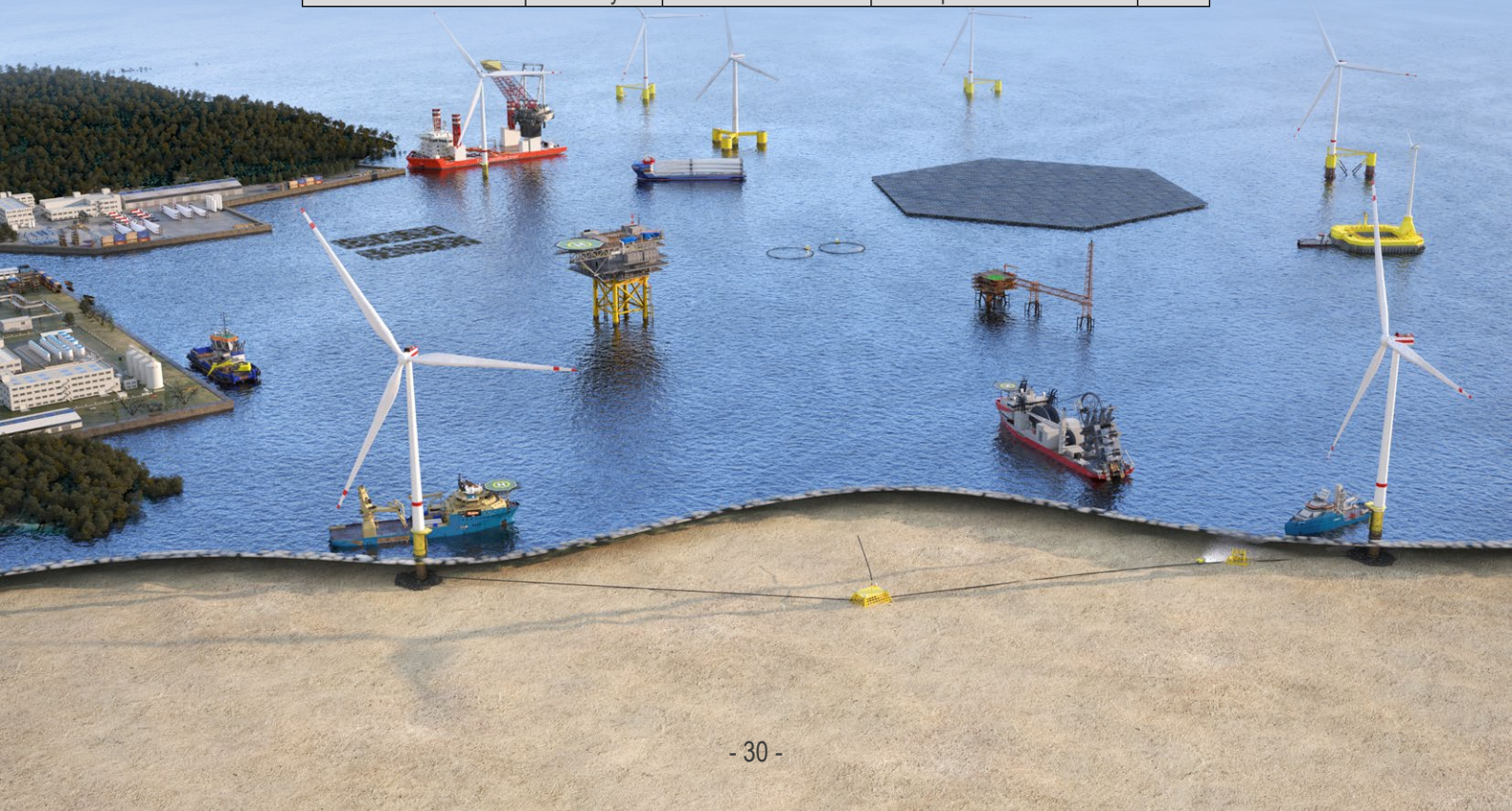
Once installed the filter unit Rockbags create their own mini ecosystem encouraging the regeneration of aquaculture environments, this aspect has become an important aspect for developers adding real value environmental engineering and sustainability in their subsea solutions.

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



Jochem Tacx
Cesare Meinardi



BUILDING AN OFFSHORE WIND FARM

OPERATIONAL GUIDE

Second edition



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 WIND FARM IN FRANCE, SAINT NAZAIRE

Liebherr Maritime Crane CAL 64000 on DEME's Innovation operating at depths of 12 to 25 metres in the Atlantic Ocean, sets new standards with its colossal 1,700 tonnes lifting capacity

Photo credit: Christophe - Photo/Vidéo Offshore/Industry/Building sites





OFFSHORE PHOTOGRAPHER

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

Christophe Beyssier

Photographer – France

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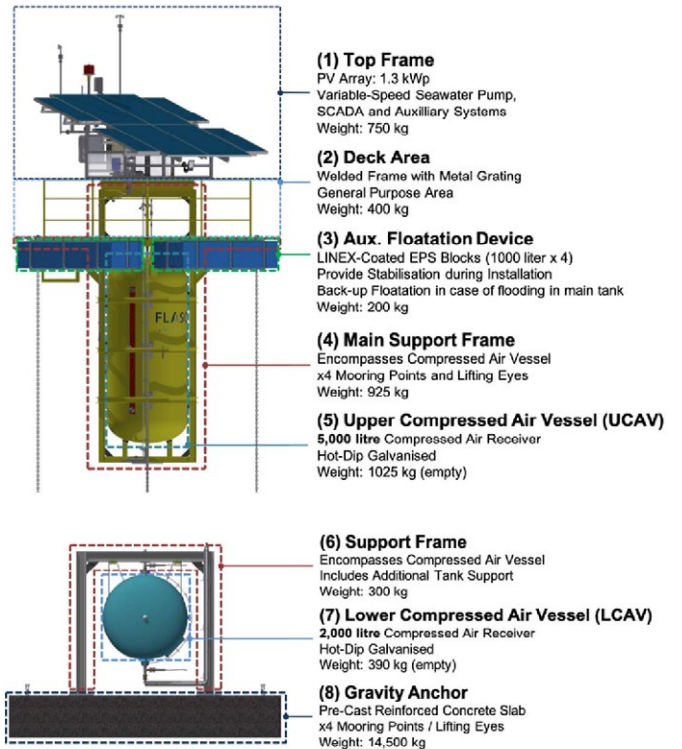


FLASC

HPES is the first solution tailored for
**CO-LOCATION OF LARGE-SCALE ENERGY STORAGE
 WITH OFFSHORE WIND**

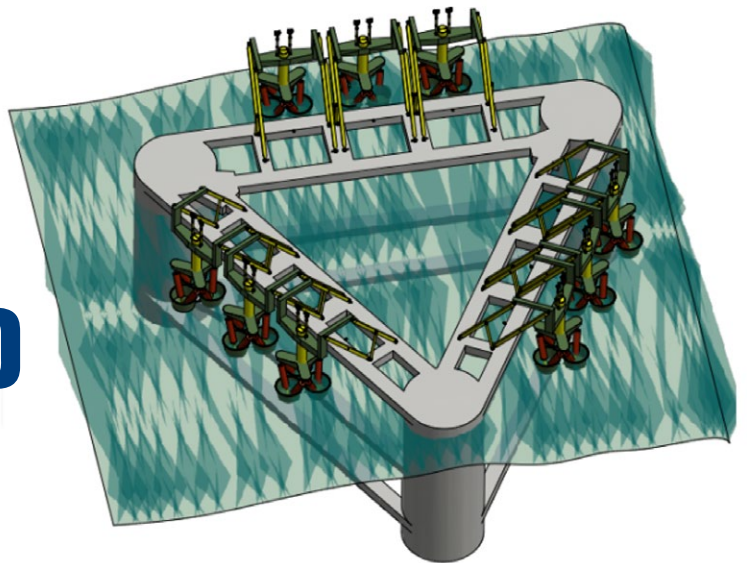
Hydro-Pneumatic Energy Storage by FLASC will boost the
 growth and profitability of this critical clean energy source.

Scalability >100 MWh	Roundtrip Efficiency 70 – 75%	✓ <i>Inherently Safe</i>
Storage Duration 4 – 24 hours	Operational Lifetime +30 years	✓ <i>Circular: built primarily out of steel</i>
✓ <i>Suitable for Bottom-Fixed & Floating Applications</i>		✓ <i>No rare-earth materials and an established supply-chain</i>





WAVEHEXAPOD TECHNOLOGY



How the WaveHexapod works

The wavehexapod is a hexapod consisting of 6 generators on 3 buoys. The hexapod hangs from a fixed connection with the outside world at the top. We have now designed submersibles that contain 9 Hexapods and are connected to the bottom only with anchor cables.

The wavehexapod can make optimal use of the movement of the waves with its 3 buoys. Waves go up and down, but also move in the horizontal plane. With its hexapod structure, the wavehexapod can make optimal use of this 3D movement. Every movement can be converted into energy in this way, in the case of wavehexapod this energy is converted into

electricity through the 6 generators.

The wave hexapod has a unique proposition. Because the hexapod can be safely placed between windmills with a submersible, we use the existing infrastructure to increase the energy output in the wind farm. Up to 4 times more energy per year. In addition, the wavehexapod with its submersibles can also be located in old depreciated wind farms to generate energy, in order to make optimal use of the existing cabling.

Both with brownfield (old park engineering) or greenfield (new park engineering) the wave hexapod does not use the windmill poles, but only uses the electricity connection of the poles.

OCEAN POWER TECHNOLOGIES SECURES \$1.5 MILLION IN PURCHASE ORDERS FOR WAM-V USV'S IN LATIN AMERICA

OPT's Landmark Orders in Latin America Support Path to Profitability and Open up Region for Additional Growth

MONROE TOWNSHIP, NJ, March 26, 2024 - Ocean Power Technologies, Inc. (NYSE American: OPTT) ("OPT" or the "Company"), a leader in innovative and cost-effective low-carbon marine power, data, and service solutions, today announced the largest quantity order in the company's history, marking a significant commercial milestone. A valued customer engaged in the offshore energy service industry in Latin America has placed purchase orders for multiple WAM-V USV's, representing a substantial investment totaling over \$1.5 million and highlighting OPT's continued expansion in the region.

The WAM-V's, renowned for their cutting-edge technology and versatility, will be deployed in hydrographic applications and by utilizing their adaptability and reliability will provide our

customer with an unrivaled versatile multi-application solution. This landmark order not only underscores the growing demand for OPT's innovative solutions but also solidifies the company's position as a leader in the marine robotics industry.

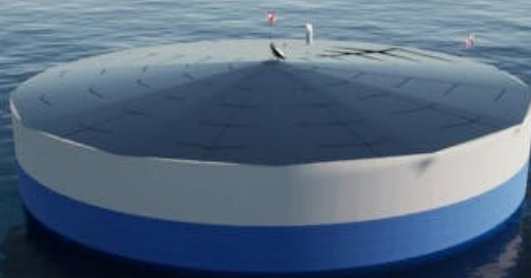
Commenting on this significant achievement, Philipp Stratmann, President, and CEO of Ocean Power Technologies, expressed his enthusiasm, stating, "We are thrilled to see the growing interest and confidence in our technologies, particularly from our strategic partners in Latin America. This order marks a pivotal moment for OPT, highlighting our continued commitment to delivering unparalleled solutions to the region that redefine possibilities in marine robotics."

With a proven history of delivering state-of-the-art solutions tailored to meet the evolving needs of diverse industries, OPT remains at the forefront of innovation in the maritime sector. The company's dedication to excellence and customer satisfaction continues to drive its success, enabling it to forge strategic partnerships and expand its global footprint.

About Ocean Power Technologies:

OPT provides intelligent maritime solutions and services that enable safer, cleaner, and more productive ocean operations for the defense and security, oil and gas, science and research, and offshore wind markets. Our PowerBuoy® platforms provide clean and reliable electric power and real-time data communications for remote maritime and subsea applications. We also provide WAM-V® autonomous surface vessels (ASVs) and marine robotics services. The Company's headquarters is in Monroe Township, New Jersey and has an additional office in Richmond, California. To learn more, visit www.OceanPowerTechnologies.com.





PLOTTEC

FLOATING OTEC PROTOTYPE SCHEDULED FOR YEAR-LONG TRIALS OFFSHORE THE CANARY ISLANDS, AS FABRICATION PHASE ADVANCES

Seven European partners have started developing an ocean thermal energy conversion (OTEC) platform. The scaled platform, developed in the framework of the EU-funded PLOTTEC project, will be implemented in a test site in the Canary Islands for deployment offshore Spain in the upcoming months.

The newly developed structure will establish floating Ocean Thermal Energy Conversion (OTEC) technologies in harsh weather environments. These environments include hurricanes, typhoons, severe storms, and climate-related events like El Niño.

The structure is formed up of three primary components: a cylindrical hull, a cold-water riser pipe, and a gimbal connecting point. AGRU is fabricating the cold-water riser pipe in Austria, while Hidramar Shipyard in Gran Canaria is building the cylindrical hull, the biggest component of the system, with delivery expected in June.

Over its operational period, lasting around 12 months, the platform is set to endure the Atlantic Ocean's conditions. Global OTEC said that computer simulations and a scaled tank test conducted in London last year confirmed the functionality

of the proposed OTEC structure.

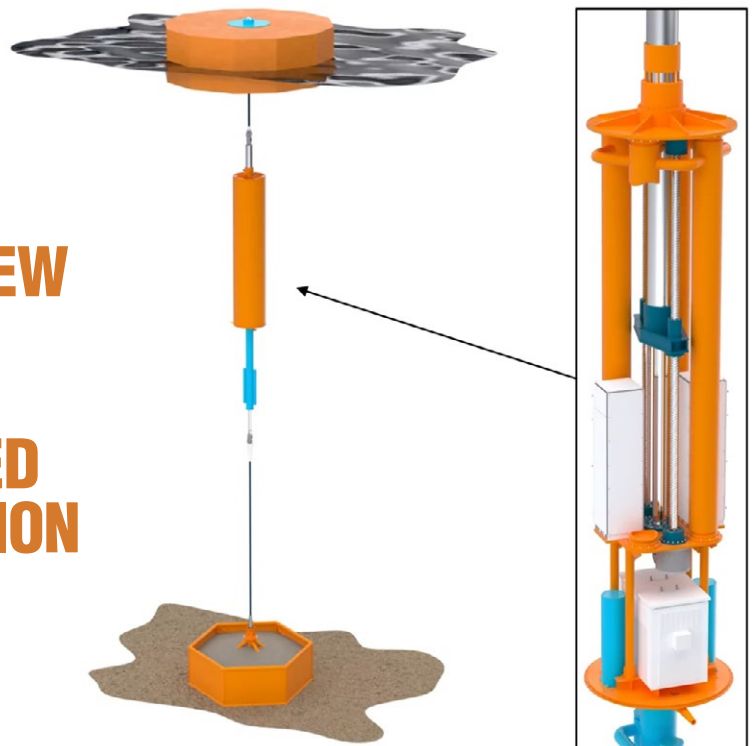
The project's conclusions are anticipated to encourage marine engineering design, new substances, and computer modeling, making OTEC technology and materials more accessible for other offshore floating energy and marine equipment. The full-scale OTEC structure is designed as well to be swiftly disconnected during extreme weather events and transferred to a safe harbour until the storm passes.

The project's consortium involves Global OTEC (UK), Cleantech Engineering Limited (UK), WavEC Offshore Renewables (Portugal), The Oceanic Platform of the Canary Islands PLOCAN (Spain), Quality Culture (Italy), Agru Kunststofftechnik Gesellschaft m.b.H. (Austria), and the University of Plymouth School of Engineering, Computing, and Mathematics (UK).

"This prototype will present our team with an ideal platform to test our cylindrical hull and gimbal solutions in 20-m equivalent waves and hone our offshore connection and disconnection procedure allowing us to maximise asset lifetime and availability even in storm-prone regions," Sam Johnston, lead engineer at Global OTEC, said.



INFINITYWEC BALL SCREW ACTUATION SYSTEM UPGRADED TO 25-YEAR LIFETIME AND IMPROVED CONTROL OF BUOY MOTION AND PTO VELOCITY



Ocean Harvesting and ball screw manufacturer NSK have completed the design of the ball screw actuation system for InfinityWEC generation 6, and Ocean Harvesting is now raising 500 000 EUR for 2024 activities and preparing for a 1:3 scale sea trial project in 2025-2026.

Wave energy is a vast resource of renewable energy that can produce electricity more consistently and at different times than wind and solar. This increases the value of produced electricity and reduces the energy storage needed to balance the grid. InfinityWEC is a novel wave energy converter with a breakthrough power take-off and control system, providing an outstanding annual energy production by maximizing the energy output from every individual wave. The technology also has very high material efficiency using circular materials with low-cost and low-CO2 emissions, leading to low cost of electricity and low environmental impact.

During 2023 and early 2024, Ocean Harvesting has focused on developing the ball screw actuation system in the generation 6 power take-off of the InfinityWEC wave energy converter. Simulation models have also been updated and extreme and fatigue loads have been analysed.

Ball screws are very efficient at converting linear motion with high force into a high-speed rotation suitable for direct drive generators/motors, to provide instant force control which is key to InfinityWEC's exceptional energy production performance. InfinityWEC is a novel and challenging application with regards to extreme and fatigue loads, and much work has been done to improve operating conditions for the ball screws. Furthermore, the number of ball screws in the PTO have been increased from two to four to achieve 25-year lifetime, which at the same time increases the available force from the ball screws from 1 to 2 MN. This in turn makes it possible to control the motion

of the buoy and the velocity in the power take-off, which is important for the durability of the ball screws and to reduce forces during end stops.

“Ball screw actuators in combination with our hydrostatic pre-tension system is a very efficient solution,” says Mikael Sidenmark, CEO Ocean Harvesting, “which benefits from advanced predictive control algorithms to optimize the force applied to the buoy in every given moment, resulting in both outstanding annual energy production and that motion and loads can be controlled and reduced.”

Eduardo Rodriguez, Director NSK Europe, says: “We see a clear synergy between high efficiency products and limitless energy sources like waves, as well as many opportunities for success and development in this area. We’ve established a longstanding partnership with Ocean Harvesting, and know that together we can develop successful prototypes and deliver very promising results. NSK is a leading manufacturer of ball screws in the high-load sector, and we expect that developments like this will open up a large field of activity for us going forward.”

Mikael Sidenmark continues: “Focus in 2024 is to perform structural analysis, implement model predictive control (MPC), and to complete the full-scale system design. We will also prepare for a 1:3 scale sea trial project planned for 2025-2026, as well as bring forward our buoy technology as part of the on-going EU-financed WECHull+ project. For these activities in 2024, we are now raising 500,000 Euro, preliminarily divided into a 120,000 Euro financing for the period March – June 2024 and 380,000 Euro for the remainder of the year.”

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SYRENNA'S WATERDRONE IS THE OCEAN-MONITORING 'UNDERWATER WEATHER STATION' OF THE FUTURE



As crucial as the ocean is to countless industries, we lack the kind of systematic knowledge of it that we have of the surface. Syrenna has built a versatile robotic platform that you might think of as a mobile weather station for the sea, and is ready to emerge from stealth to enable precise, real-time monitoring of Earth's largest liquid asset.

It may surprise you how little we know about the ocean. Certainly we know a lot in general, trends and patterns over seasons and decades. But when it comes to specifics, like what is the temperature, salinity and microplastic count two miles off the coast of Barcelona at 20 meters deep right now, we're clueless.

This is partly due to the simple fact that the ocean is gigantic and there's simply no way (or need) to monitor all of it. But even areas important to fishing, oil and gas, tourism and other maritime industries are checked by labor-intensive or expensive

methods like sending out a ship or robotic underwater vehicle. Cheap solutions like buoys are great but limited to surface measurements, and are subject to the whims of weather and currents.

Syrenna's solution distills several methods into one: a robot that can control its own depth while maintaining geographic location, allowing for persistent, near-real time sensing and tracking of any number of important marine metrics.

"There is such a clear need for safe, reliable and continuously updated data about water quality," said Ester Strommen, CEO and co-founder of Syrenna. "Widespread use of technology will drastically increase our knowledge of how our oceans are actually doing; we could detect harmful bacteria, runoff and pollution, track global warming, monitor species and conduct subsea surveillance."

OCEAN HARVESTING RAISING €500,000 FOR WEC DESIGN UPDATE AND PREPARATION FOR SEA TRIALS

Ocean Harvesting Technologies AB has been developing the wave energy converter InfinityWEC since 2017. During 2023 and early 2024, focus has been on the ball screw actuation system in the power take-off and refining simulation models for generation six of the technology.

Full-scale system design of InfinityWEC will continue in 2024, planned to be followed by a 1:3 scale sea trial project in 2025–2026.

Ocean waves are a vast resource of renewable energy and wave power can produce electricity more consistently and at different times than wind- and solar power. This increases the value of produced electricity and reduces the energy storage needed to balance the grid or stand-alone facilities.

InfinityWEC is a novel wave energy converter with a breakthrough power take-off, providing very cost-efficient electricity production by maximizing the energy output from every individual wave, and producing up to 500 kW continuous power output. The energy production cost (LCOE) is estimated to be very competitive at 100 Euro/MWh already at 100 MW deployed capacity and <35 Euro/MW at GW scale deployment.

“The ball screw actuators in the power take-off in combination with our hydrostatic pre-tension system is a very efficient solution,” says Mikael Sidenmark, CEO Ocean Harvesting.

“It benefits from the use of advanced model predictive control algorithms to optimize the force applied to the buoy in every given moment, which results in both outstanding annual energy production and the ability to control and reduce buoy motions and loads in the system.”

InfinityWEC is based on circularity by design principles and achieves very high material efficiency and low environmental impact through the combination of high energy output and use of low-cost and low-carbon materials. InfinityWEC is engineered for large-scale production and effective transports and logistics enabling efficient deployment of wave farms.

Mikael Sidenmark continues: “Our focus in 2024 is the implementation of a new enhanced model predictive control (MPC) algorithm in the control system, and completion of the full-scale system design. We will also bring forward our buoy technology as part of the on-going EU-financed WECHull+ project. Preparations will continue for the 1:3 scale sea trial project planned for 2025-2026, for which a two million Euro grant has been approved by the Swedish Energy Agency.”

For these 2024 activities, new investors are invited to a 500,000 Euro financing round, divided into 120,000 Euro for the period April–June 2024 and 380,000 Euro for the remainder of the year.





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



QED CO-DEVELOPING MORE SUSTAINABLE THERMOPLASTIC TURBINE BLADES FOR A GREENER FUTURE!

Composite blades are the backbone of modern turbines, harnessing renewable energy on a large scale. However, while these blades offer significant advantages in terms of performance and durability, they also come with a notable downside: life cycle analysis (LCA) costs which need to be considered carefully. This issue arises due to the challenges associated with maintaining, repairing, and, ultimately, disposing of composite blades.

Indeed, as turbines reach the end of their operational lifespan, the disposal of composite blades poses a significant challenge due to their typical construction of non-recyclable materials, including fiberglass. As they are designed to endure years of relentless exposure to the elements, blades are difficult to break down and costly to dispose of responsibly.

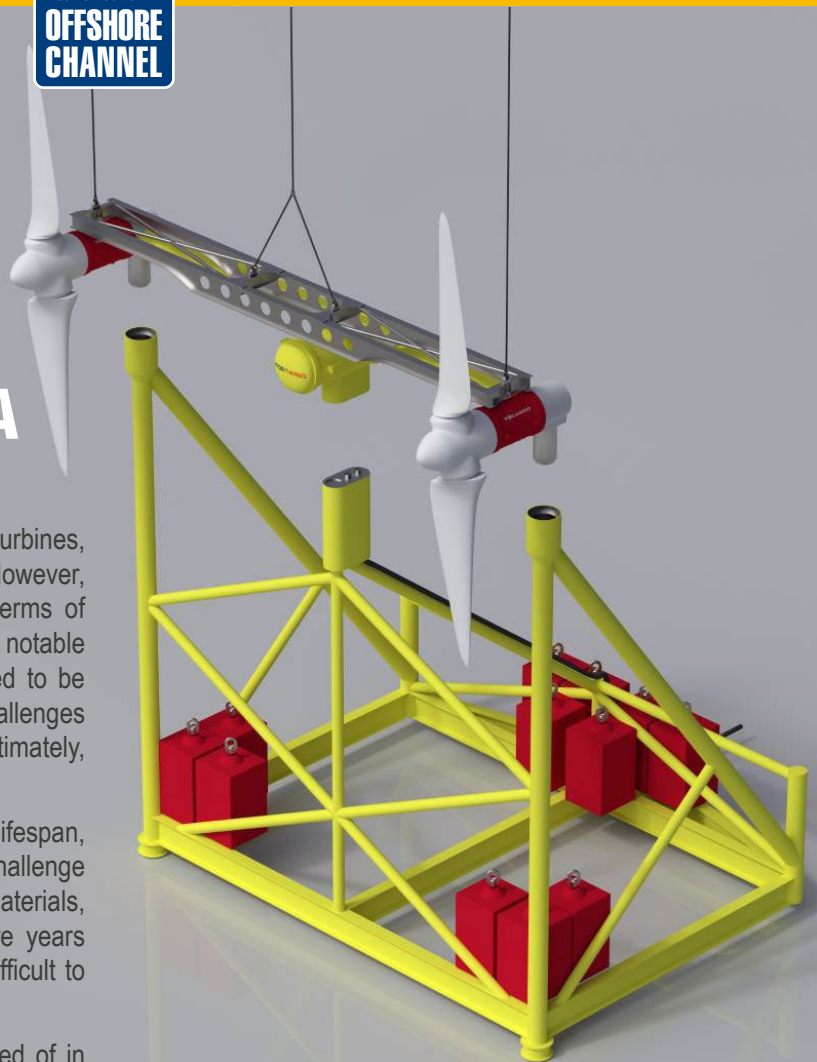
Additionally, composite blades are commonly disposed of in landfill sites which contributes to environmental pollution as these materials do not readily decompose and can release harmful substances into the atmosphere.

In response to the pressing need for more sustainable and cost-effective alternatives, QED Naval and the University of Edinburgh, in collaboration with Co-tide and Sheffield University, are pioneering the development of a thermoplastic blade that they can compare with the thermoset blade they manufactured as part of QEDs TIGER Interreg project last year.

Unlike traditional composite blades, thermoplastic blades will utilise materials that can be recycled or re-moulded at the end of their lifespan which will significantly reduce through-life costs. This includes lower maintenance and repair expenses, as well as a simplified and more economical, more environmentally friendly, end-of-life disposal.

Furthermore, thermoplastic materials offer several performance advantages over traditional composites, including greater resistance to fatigue, enhanced durability, and improved structural integrity. These characteristics translate to increased reliability and longevity, further reducing operational costs over the turbine's lifespan.

As the demand for renewable energy continues to grow, the importance of addressing the through-life costs of turbine technology becomes increasingly apparent. The development of thermoplastic blades represents a significant step forward in this endeavour, offering a promising solution that combines economic efficiency with environmental sustainability.





SOLARDUCK

NAUTICAL SUNRISE PROJECT TO FACILITATE R&D OF THE LARGEST OFFSHORE FLOATING SOLAR POWER PLANT IN THE WORLD

Nautical SUNRISE Project to facilitate R&D of the largest Offshore Floating Solar power plant in the world

The Nautical SUNRISE project is set to support the world's largest Offshore Floating Solar power installation. The € 8.4 million project, supported with € 6.8 million of the Horizon Europe programme, kicked off in December 2023 to execute research and development on offshore floating solar (OFS) systems and its components. The outcomes of the project will enable the large-scale deployment and commercialisation of OFS systems in the future, both as standalone systems and integrated into offshore wind farms.

This project will provide valuable research to develop technologies to showcase an intended 5 MW offshore floating solar system using the modular solution of Dutch floating solar company SolarDuck.

The Nautical SUNRISE consortium will conduct extensive research and testing

to ensure the reliability, survivability, electrical stability, and yield of offshore floating solar systems. A comprehensive scale-up plan will address the challenges and create opportunities to drive forward the commercialisation of offshore floating solar systems.

With sustainability in mind, Nautical SUNRISE is committed to consider the environmental impact and sustainability of OFS. The project will assess the environmental footprint, circularity, and full life cycle sustainability of offshore floating solar systems. This assessment will not only cover the demonstrator project but also include multiple GW-scale commercial projects, ensuring a comprehensive understanding of the technology's ecological implications.

The Nautical SUNRISE consortium is looking forward to paving the way for a new era in offshore renewable energy, contributing to a more sustainable future for generations to come.

SolarDuck's CTO Don Hoogendoorn says: "This subsidy allows SolarDuck with its partners to push the environmental boundary of the design and at the same time get an in-depth understanding of the ecological and reliability of the design."

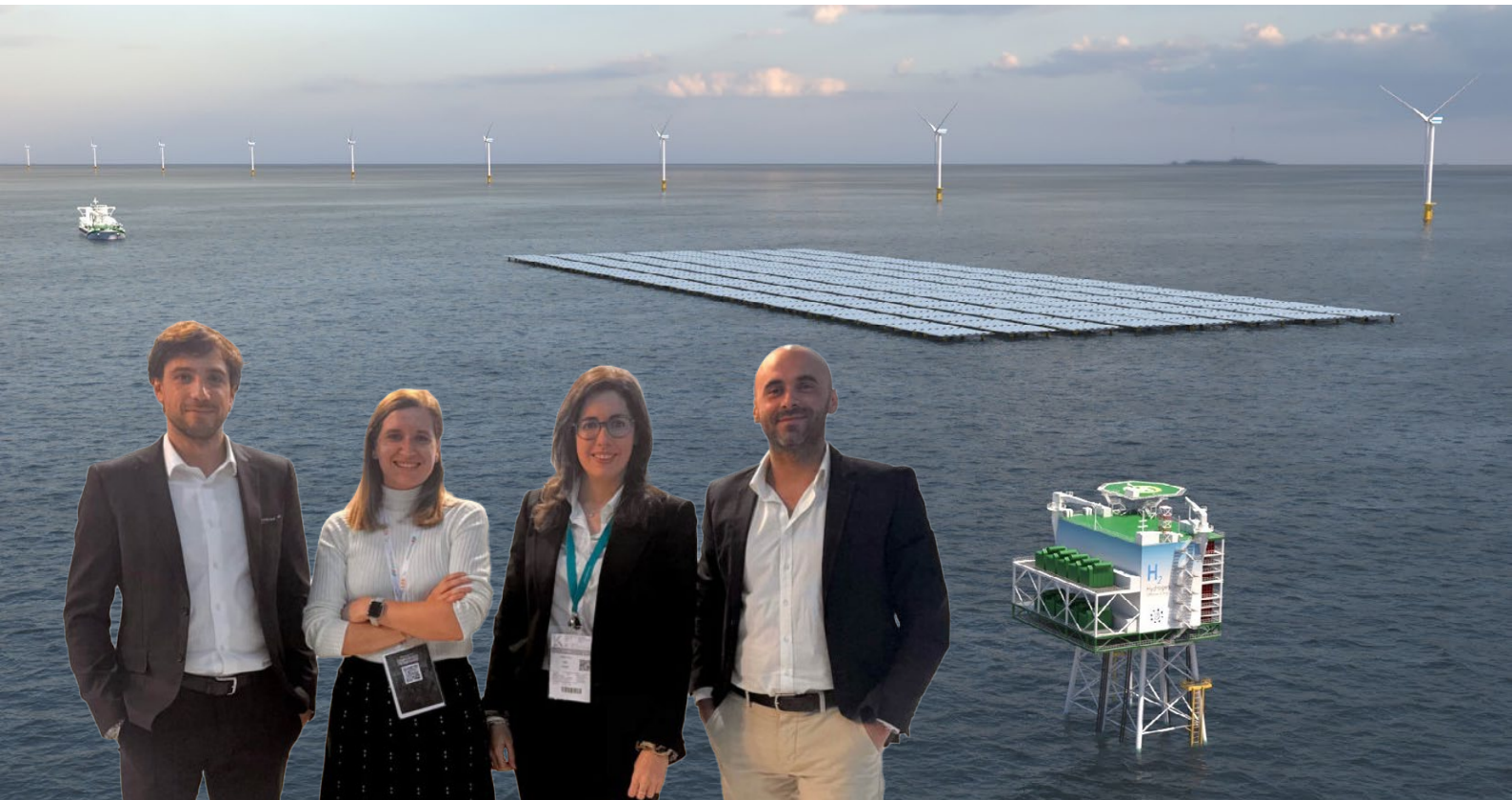
DMEC CTO Simon Stark says: "We are excited to coordinate the Nautical SUNRISE project as one of the flagship initiatives of offshore solar in Europe."

Nautical SUNRISE consortium partners

The project is made possible via a collaboration of its partners: project lead Dutch Marine Energy Centre (DMEC), SolarDuck, RWE, Blunova – a Carlo Maresca Group company, Bridon-Bekaert The Ropes Group, Deltares, Hasselt University (UHasselt), KU Leuven, Oxford PV, SINTEF Industry, SINTEF Ocean, The Catalonia Institute for Energy Research (IREC-CERCA), INESC TEC, and WavEC Offshore Renewables.

RAMBOLL

RAMBOLL CONTRACTED ON ITALIAN PROJECT COMBINING OFFSHORE WIND, FLOATING SOLAR & POWER-TO-X



Ramboll has been appointed to deliver advisory and technical support for the 600 MW Agnes Romagna offshore wind project, proposed to be built in the Italian sector of the Adriatic Sea and planned to integrate several other systems, including floating photovoltaic, battery storage and a hydrogen production plant.

Ramboll's team will support the developer, Italian renewable energy company AGNES, throughout the authorisation process which is currently underway and is expected to be completed by the end of the year.

For the proposed offshore energy hub, Ramboll will provide concept design during the initial design phase, as well as strategic advisory including the estimation of capital expenditures (CAPEX) and operational expenditures (OPEX).

"It is great to be part of such an innovative project in the Mediterranean Sea combining offshore wind and solar energy with a Power-to-Hydrogen plant and a battery storage. Our expanding team of local wind experts is thrilled to support and contribute to Italy's way to a more sustainable energy supply," said Lorena Tremps, Head of Wind Advisory, Mediterranean at

Ramboll.

Italian authorities received an application for the project back in 2021, when AGNES, together with Saipem and QINT'X, applied for a concession for a site in the Adriatic Sea, off the coast of Ravenna.

The Agnes Romagna Hub consists of two offshore wind farms, Romagna 1 and Romagna 2, with a total capacity of 600 MW.

Romagna 1 is proposed to be built 22 kilometres off the coast of Lido di Classe, spanning an area of 85 square kilometres, where 25 wind turbines with 8 MW of capacity each would be installed. The floating photovoltaic system with a power of 100 MWp would be installed next to the Romagna 1 wind farm.

Romagna 2 would have a capacity of 400 MW with up to 50 8 MW turbines spinning some 26 kilometres offshore Porto Corsini.

In addition to floating solar, the offshore energy hub is also planned to integrate a Power-to-Hydrogen plant and battery storage.

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

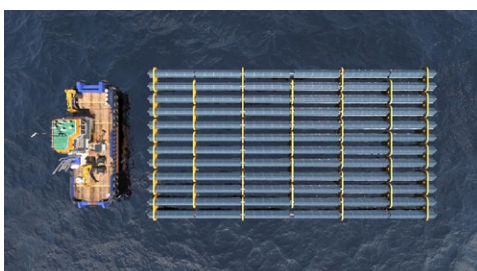
waves have less attack surface. Thus, many photovoltaic projects can from a static point of view with classic modules on land and on water realized only at high cost.

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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- 03 **OFFSHORE FLOATING SEAWEED FARM** WyndTek Netherland 2021
- 04 **SOUTH BROOKLYN MARINE TERMINAL** SEA.O.G Company USA 2021
- 05 **CONTROLLED FLOW EXCAVATION** Seajet UAE 2021
- 06 **OFFSHORE FLOATING SOLAR PANEL** Agnespower Italy 2021
- 07 **OFFSHORE INSTALLATION VESSELS** Offshoretronic Spain 2021
- 08 **SMT ROV** Hughes Subsea England 2021
- 09 **LOAD REDUCTION MOORING TECHNOLOGY** TFI Marine Ireland 2021
- 10 **LRD SYSTEMS FOR FLOATING OFFSHORE WIND TURBINES** Dublin Offshore Ireland 2021
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- 16 **OFFSHORE WIND INSTALLATION VESSEL** Xperk Netherland 2022
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- 19 **MONO PILE INSTALATION VESSEL** Windecom Spain 2022
- 20 **OFFSHORE ROCK BAGS** Ridgeway England 2022

Client Country Year

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Digital Marketing Agency

- Offshore 3D Animation
- Single Frame Rendering
- Web Design & SEO

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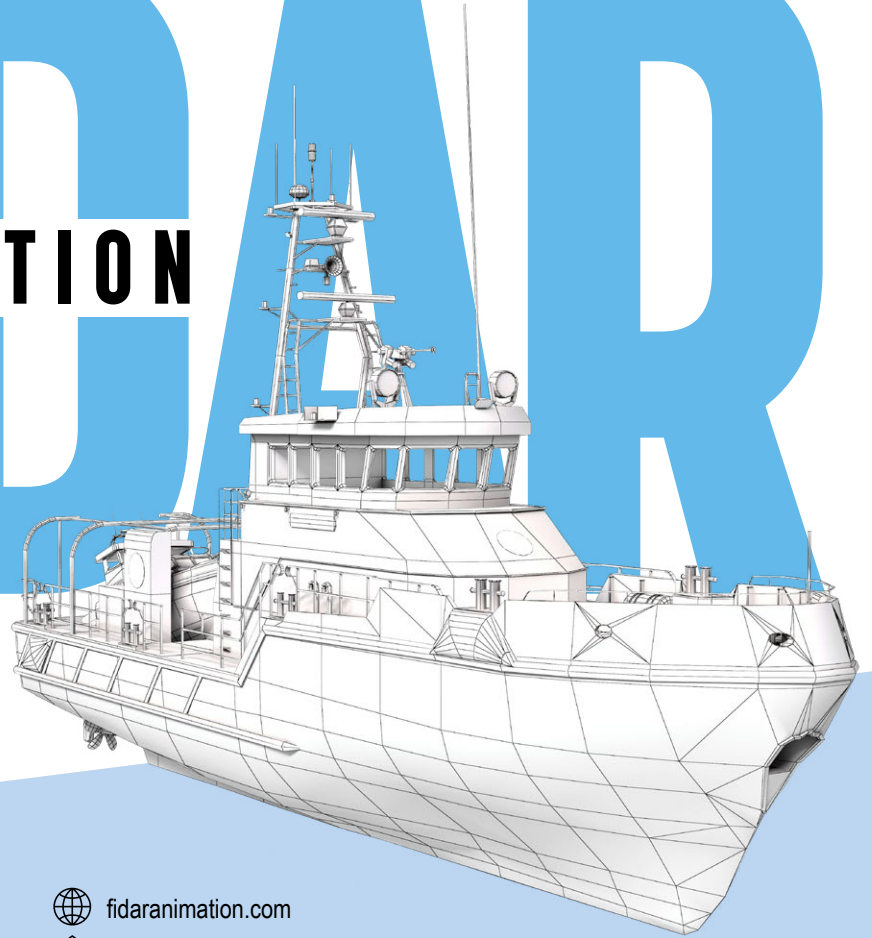


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