

OFFSHORE CHANNEL

WORLD TREND & TECHNOLOGY FOR OFFSHORE ENERGY SECTOR



Offshore
Renewable
Energy

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

Jul & Aug 2024



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.

HENGTONG GROUP'S LARGE-CAPACITY WIND INSTALLATION JACK- UP HAS COMMENCED ITS WIND TURBINE INSTALLATION WORKS FOR THE VERY FIRST TIME IN CHINA

The Hengtong Haiyue jack-up is responsible for installing a total of twelve turbines at the Hainan Danzhou CZ3 offshore wind project in Hainan, China.

Once fully commissioned, the offshore wind farm, owned by China Datang Corporation, is expected to provide Hainan Province with 3.66 billion kWh of clean electricity every year, saving 1.1 million tonnes of standard coal.

In addition, the project is expected to reduce CO₂ emissions by 2.87 million tonnes, SO₂ by 23,000 tonnes, and nitrogen oxides by 13,000 tonnes.

The jack-up was delivered to the Hengtong Group by Jiangsu Dajin Heavy Industry in August this year.

The mobile platform features a 1,600-tonne leg-encircling full-circle slewing crane, with a 4,000-square-metre deck capable of supporting a variable load of over 8,500 tonnes.

It is designed to install offshore wind turbines with capacities of up to 20 MW.



FIRST SUCTION BUCKET JACKET FOUNDATIONS IN THE ASIA- PACIFIC REGION HAVE ARRIVED AT TAICHUNG PORT

A big milestone for the 920 MW Greater Changhua 2b and 4 offshore wind farms! The first batch of suction bucket jacket foundations (SBJs) from Korea has arrived at the Port of Taichung.

Standing about 80 meters tall and weighing up to 2,300 tonnes per jacket, these SBJs consist of steel cylinder structures pre-attached to jacket braces, allowing faster pile-free installation with minimal noise, making it one of the most eco-friendly foundation technologies.

Currently, 44 of the planned 66 SBJs have been fully assembled. More foundations and wind turbine components will arrive at Taichung soon, to prepare for offshore construction early next year.



COMBINING ATOMS PLATFORM WITH THE LIFTRA INSTALLATION CRANE

As the industry scales up with next-generation turbines over 15MW, the demand for specialized solutions is growing. One of the biggest challenges in offshore turbine installation and maintenance is the shortage of jack-up vessels capable of handling these larger turbines efficiently. To address this, cutting-edge solutions like the Liftra Installation Crane combined with the ATOMS platform are transforming offshore operations.

In collaboration with SOLVE WIND, this platform is set to revolutionize the offshore wind sector by providing a more flexible and scalable option for turbine installation and maintenance, especially in regions with infrastructure constraints, like the USA, Japan, and Korea.

The ATOMS platform brings a variety of benefits:

Lowering the LCOE:

A more economical solution compared to traditional jack-up vessels, reducing overall project costs.

Flexibility:

The ATOMS technology is designed for use on both fixed-bottom and floating turbines. Additionally, the Self-Hoisting Crane technology eliminates hub-height as a limiting factor and thereby supports cost-competitive deployment of taller turbines.

Increased vessel availability:

As a low-CAPEX solution, SOLVE's technology can be produced in more units, contributing to higher availability as well as lower charter rates.





Offshore Wind 4 Kids



We are beyond excited to launch our new **Floating Wind Model Set** Designed to inspire and educate the next generation about renewable energy and offshore wind technology!

Our model set features 5 unique floating wind turbine designs:

- Semi-Sub
- Suspended Counterweight
- Tension Leg Platform
- Barge
- Spar-Buoy



Features:

Expert Craftsmanship: the models are crafted with the utmost care to ensure realistic and highly detailed models that replicate the complexities of a real floating wind turbines.

Educational Value: Perfect for aspiring engineers and renewable energy enthusiasts, these models provide an excellent opportunity to learn about the mechanics and design of floating wind turbines.

Interactive Components: With movable parts and a functional design, the models allow you to explore the intricacies of turbine operation, from the rotating blades to the stabilising bases.

Materials: Made from non-branded building blocks, the models ensure durability and a sleek, professional finish that stands out in any collection.



REVOLUTIONIZING BOLTING TECHNOLOGY: MEET THE XA1 POWER BATTERY HYDRAULIC PUMP BY PLARAD

For over 60 years, Maschinenfabrik Wagner, known under the brand PLARAD, has been at the forefront of bolting technology innovation. Specializing in a broad range of torque and tension systems—including electrical, pneumatic, hydraulic, manually, and battery-powered torque tools and pumps—PLARAD also offers comprehensive service and maintenance solutions for all common bolting systems.

Now, PLARAD is setting a new standard in the industry with the introduction of the XA1power Battery Hydraulic Pump. This groundbreaking tool is designed to transform the way you approach bolting operations, offering unmatched flexibility and ease of use.

Why the XA1power Stands Out:

170 bolting applications per charge: Reliable performance you can count on.

Lightweight and compact: Weighing only 10 kg, the XA1 is easy to transport and reduces physical strain.

Wireless remote control: Enjoy full operational freedom with remote access.

Engineered for excellence: CE-approved and designed by

industry experts, ensuring top-tier performance.

Fully automatic operation: Simplifies tasks and boosts productivity.

Test over 1000 bolts on a single charge: Maximize efficiency with an impressive battery life.

Perfectly engineered to operate hydraulic wrenches up to 800 bar and deliver torque up to 150,000 Nm, the XA1 offers unparalleled versatility. Its compact design eliminates the tripping hazards associated with traditional power cables and heavy equipment, making it an ideal choice for both fieldwork and industrial environments.

With the XA1, PLARAD introduces a new era of bolting technology. Whether you're working in construction, wind energy, or oil and gas, this innovative tool delivers the power and precision you need—anywhere, anytime.

Contact us for more information:

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Photo by: Meng Wei WEI



Stiesdal

STIESDAL OFFSHORE AND COPENHAGEN INFRASTRUCTURE PARTNERS ENTER INTO PARTNERSHIP TO DRIVE INNOVATION AND COST EFFICIENCY IN FLOATING OFFSHORE WIND

Stiesdal Offshore and Copenhagen Infrastructure Partners (CIP), through its fund

Copenhagen Infrastructure V (CIV), today announce a strategic partnership. Together the parties will work to establish Stiesdal Offshore as a long-term leader in the floating wind industry.

As part of the partnership, CIV acquires a minority stake in Stiesdal Offshore. The financial details of the transaction are not disclosed.

Stiesdal Offshore will now initiate a plan to expand its business scope from design and development of floating foundations to becoming a one-stop shop for floating wind enablement. This includes offering owner's engineering services and as well as comprehensive full-service project support and execution, through active engagement with customers on every aspect of floating wind projects. The aim is to help customers reduce

the cost and complexity of projects and to accelerate the development of floating offshore wind.

Floating wind is expected to grow significantly between 2030 and 2040 and, according to the International Energy Agency (IEA), has the potential to increase the global offshore wind resource by a factor of 10.

"The right partnership is crucial for us, and I am very happy to welcome CIP on board," said Peder Nickelsen, CEO of Stiesdal Offshore. "We have a clear plan to reduce the CAPEX of floating wind and have developed more than 30 specific initiatives to achieve this goal. This investment will enable us to accelerate these efforts and strengthen our market position as we prepare for large-scale commercial deployment of floating offshore wind in the coming years."

Michael Hannibal, Partner at CIP said: "We remain committed to floating offshore wind which we believe will play an important role in the global energy transition. This investment is a next step in our pursuit of large-scale floating wind projects and together with Stiesdal Offshore we look forward to work towards advancing floating wind technology, overall project

execution and cost reduction."

One-stop shop for floating offshore wind projects

Stiesdal Offshore's proactive engagement with WTG OEMs, certification bodies and other contractors and suppliers throughout the floating wind project lifecycle leads to viable project outcomes and significantly reduces project risks for clients. As a one-stop shop for floating offshore wind projects, the company will provide owner's engineering solutions regardless of foundation technology.

Going forward, strengthened by CIP's support, Stiesdal Offshore will launch a number of innovative development initiatives aimed at achieving the cost reductions necessary to enable the floating wind market. By spearheading these innovations and solutions, Stiesdal Offshore aims to position itself as a key enabler in the highly complex floating wind sector.

Principle Power

PRINCIPLE POWER EXPANDS WINDFLOAT® PORTFOLIO, LAUNCHES CENTER COLUMN DESIGNS

Principle Power has unveiled two new semisubmersible floating wind foundation designs: the WindFloat TC (tubular, center column) and WindFloat FC (flat-panel, center column).

The new designs are natural evolutions of the existing WindFloat® technologies that combines proven features to support a wind turbine located on a column in the center of the platform.

Designed to complement the existing perimeter column designs – WindFloat T and WindFloat F – the new solutions share the same 4th generation design heritage and benefits such as a Smart Hull Trim system to maximize annual energy production and reduce loads; fatigue-resilient architecture optimized for large wind turbines; compact footprint and shallow draft for maximum compatibility with infrastructure; and modular “block” subcomponent philosophy for high flexibility and compatibility with existing supply chains.

Wind turbines are growing larger, and manufacturers are increasingly focused on standardization of their products for floating wind. The availability of both perimeter column and center column designs means that the WindFloat® portfolio delivers market leading cost, weight, and performance for any wind turbine available on the market.





WINDEED AND ASCO ENTER STRATEGIC PARTNERSHIP TO ADVANCE FLOATING WIND

Windeed is excited to announce the signing of a Letter of Intent (LOI) with ASCO, a leading global provider of logistics and materials management. This partnership aims to strengthen both companies' positions in the floating wind sector by optimising logistics and operations for floating offshore wind projects.

Key Goals of the Partnership

The collaboration will focus on creating a comprehensive logistics plan to facilitate the construction and deployment of 1 GW of floating wind power in a single season using Windeed's innovative floater technology. Additionally, an advanced operations and maintenance (O&M) services plan will be developed. A core component of this strategy is the use of Windeed's unique in-situ heavy lifting solutions, allowing for significant turbine repairs directly at sea. This capability minimizes downtime and reduces the Levelized Cost of Electricity (LCOE), making Windeed's floating wind solutions both cost-effective and efficient.

About Windeed

Windeed develops best-in-class patented floating wind solutions that harness the vast potential of offshore wind resources. Our proprietary floater and mooring designs, verified by external parties, enable higher capacity factors and offer a cost-effective renewable energy alternative. Windeed's innovative solutions overcome critical industrial limitations, paving the way for rapid industry growth.

About ASCO

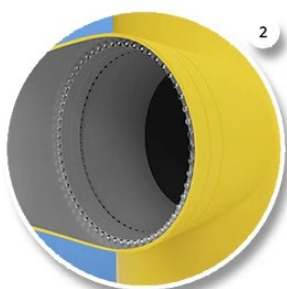
ASCO has extensive experience supporting the offshore energy sector almost 60 years, offering a suite of integrated services including logistics, materials management, lifting and assurance, warehousing, and marine coordination. This partnership presents a significant opportunity for ASCO to expand its footprint in the rapidly growing floating wind sector. By aligning with Windeed, ASCO can enhance its capabilities and tap into the vast potential of the floating wind market, which is set to become a key player in the global transition to renewable energy.



TP-PRODUCTS WINS CONTRACT FOR PATENTED FLANGE CONNECTOR IN WORLD'S FIRST BOLTED FLOATING WIND STRUCTURE!



Typical tower and
transition piece flange



Typical floater flange

TP-Products has secured a contract with Archer Wind for the supply of bolted connections for the floating wind foundation of the Culzean Wind Pilot, owned by TotalEnergies. The foundation's design is developed by Ocergy. The Culzean Wind Pilot will be connected to the Culzean platform, an offshore oil and gas facility located 230 kilometers off the East coast of Scotland, providing renewable electricity to supplement the existing gas turbine power generation.

"After 6 years of extensive testing and analysis, leveraging over 30 years of experience with this technology in the oil & gas industry, this is a significant milestone for us. Wind farm developers are finally recognizing the advantages of bolted solutions over welded ones," says Sjur Lassesen, Technical Director and founder of the solution.

"We are very proud that our patented bolted connections are helping reduce the levelized cost of energy in wind project development, offering a less expensive and much faster assembly process compared to welding," says Helle Hundseid, Sales and Business Development Director at TP-Products. She adds, "We have a prepared supply chain capable of delivering these flanges with short lead times to wind farms with multiple floating turbine foundations. It's exciting to be part of the transition from oil & gas to renewables while securing jobs. We look forward to providing our wind customers with high strength capacity, maintenance free and cost-effective solutions for floaters, transition pieces, and turbine towers."

*For more information, please reach out to Helle Hundseid:
hhu@tp-products.com or +47 99570317*



X1 WIND JOINS FORCES WITH FIBREMAX TO ENHANCE FLOATING OFFSHORE WIND TECHNOLOGY

X1 Wind has signed an MoU with market-leading mooring line manufacturer – and developer of the world's strongest cables – FibreMax to boost performance, innovation and sustainability in the floating wind energy sector.

X1 Wind's disruptive floating wind solution benefits from passive weathervaning and self-orientation capabilities, achieved through the integration of a Single Point Mooring (SPM) system with a small tension leg platform (TLP) mooring system.

The Spanish firm is making rapid progress developing its pre-commercial and commercial units, while its earlier X30 device was recognised as the world's first fully functional floating wind TLP (Tension Leg Platform) to export electricity.

One of the key benefits of X1 Wind's TLP is the vertical mooring tendons which ensure a small seabed footprint, enhancing compatibility with other marine activities, like fishing, while also allowing for a larger number of platforms to be placed within a given offshore area – increasing energy capacity.

The latest collaboration with FibreMax will now explore opportunities to boost performance and sustainability of its mooring configuration with the introduction of synthetic cables, with improved strength, durability, low-weight and no-creep characteristics. Crafted with circular or recyclable materials, FibreMax cables will further enhance the floating wind platform's green credentials.



BLACKFISH ENGINEERING AND AJT ENGINEERING SIGN STRATEGIC MOU TO ACCELERATE COMMERCIALISATION OF C-DART MOORING SYSTEM

Partnership is a milestone in offshore mooring technology, in both the Scottish and global international offshore renewable energy markets

At the Floating Offshore Wind 2024 Conference, Blackfish Engineering announced the signing of a strategic Memorandum of Understanding (MoU) with AJT Engineering. This partnership is set to fast-track the commercialisation of C-Dart, an innovative quick connect mooring system designed for the offshore energy sector.

The MoU establishes a framework in which Blackfish

Engineering, renowned for innovative ocean renewable energy technology development, will work alongside AJT Engineering, a leading Aberdeen-based manufacturer, to bring the C-Dart system to market. The partnership aims to deliver reliable, safe, and efficient mooring solutions to the growing Scottish and international offshore renewable energy market, and is seen as a significant milestone in advancing offshore mooring technology.

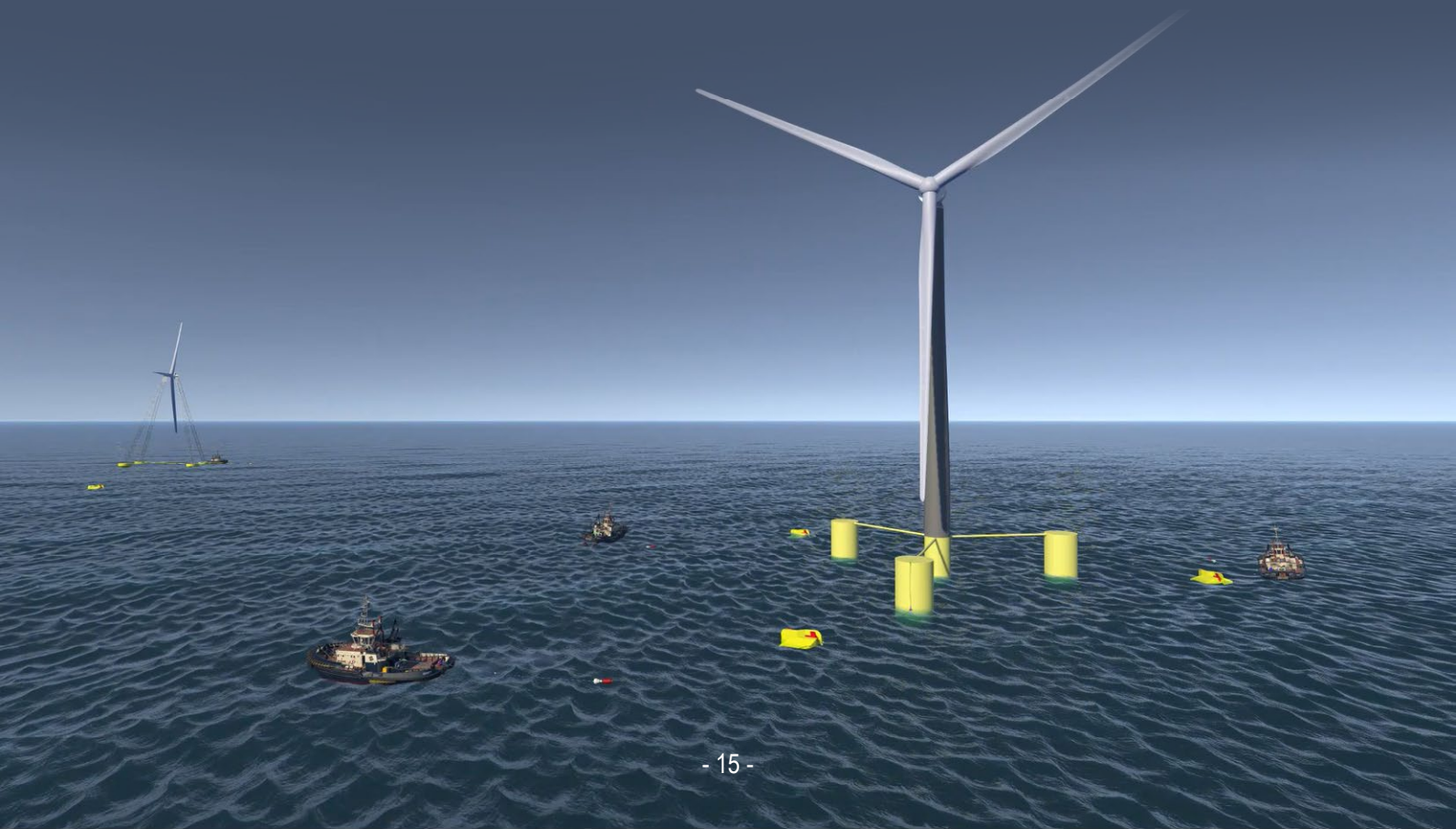
Jon Powell, Managing Director of Blackfish Engineering, stated:

"Our collaboration with AJT Engineering marks an exciting step in the journey to bring C-Dart to market. By combining Blackfish's cutting-edge engineering capabilities with AJT's world-class manufacturing expertise, we are confident in delivering a solution that meets the rigorous demands of the offshore sector."

The C-Dart system is a quick connect mooring solution designed to reduce-risk and increase efficiency in mooring processes, reducing time and risk while ensuring operational efficiency. As part of this partnership, Blackfish will lead application engineering, while AJT will handle the production and assembly, leveraging their extensive local supply chain and manufacturing capabilities in Aberdeen.

David Scalley, Managing Director of AJT Engineering, added:

"We are thrilled to collaborate with Blackfish Engineering to deliver the C-Dart system. Our extensive manufacturing expertise in Aberdeen positions us perfectly to support the commercial rollout of C-Dart and contribute to the success of Scotland's renewable energy sector."



WIND TURBINE WITH TILTED ROTOR BLADE MAY BE BENEFICIAL FOR WAKE EFFECT

An international consortium has started a study into the positive effects of wind turbines with tilted rotors. By reducing the wake effect, turbines can be placed closer together and the energy yield per turbine could improve. This could significantly reduce the costs of offshore wind production. In fact, the turbines even seem to be able to bring more wind from higher air layers to a wind farm.



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.



TURBINE COMPONENTS DELIVERED FOR 30-MW FRENCH FLOATING PILOT

The wind turbine components for a 30-MW floating wind pilot project off the French coast have arrived at the new wind terminal in Port of Port-La Nouvelle, it was announced recently.

The Eoliennes flottantes du golfe du Lion (EFGL) project in the Mediterranean Sea, a partnership between Ocean Winds and Banque des Territoires, will use three Vestas V164 wind turbines of 10 MW each. The turbines will be the most powerful ever installed on floating foundations. They will also be the most powerful turbines in France.

The turbine components for the project are now stored on

the quay, awaiting the arrival of the floating platforms in a few months. Construction of the floating structures is underway at the Grand Port Maritime in Marseille and is expected to be completed by April 2025. The project will use Principle Power's floating technology.

Turbine installation at the project site is scheduled for the end of spring 2025.

The developers expect EFGL to provide valuable lessons for the development of floating wind in the Mediterranean.

VARD PARTNER IN PROJECT TO DELIVER NEXT-GENERATION SOV FOR FLOATING OFFSHORE WIND




VARD has taken a key role in this collaboration that represents a significant step toward revolutionizing floating offshore wind operations, aiming to support the industry's growth and contribute to a more sustainable energy landscape.

North Star, a leader in the UK's renewable energy sector, has initiated a major industry partnership to address the unique challenges of floating offshore wind operations. The collaboration includes VARD, MO4, Principle Power, SMST, and Voith Group, aiming to address the operational challenges of floating offshore wind projects, which are increasingly located in deeper waters, far from shore.

The partners have signed a memorandum of understanding to

establish a dedicated working group focused on developing a high-performance SOV concept tailored to commercial-scale floating wind projects like the 17GW awarded in the ScotWind leasing round. This new vessel design aims to set a new industry benchmark for safety, performance, and efficiency, addressing the logistical complexities of deeper water wind farms.

Andrew Duncan, North Star's Renewables & Innovations Director, emphasized the potential of the partnership to innovate and create a best-in-class solution for floating wind projects, ensuring the future SOVs deliver superior operational flexibility and sustainability.



CADELER SIGNS FIRM CONTRACTS WITH EQUINOR AND POLENERGIA JOINT VENTURES FOR THE INSTALLATION VESSEL SCOPE FOR THE 1440 MW OFFSHORE WIND FARMS IN THE POLISH BALTIC SEA

Cadeler A/S has signed firm contracts with the offshore wind farms Baltyk 2 and Baltyk 3, both being joint venture projects owned 50% by Equinor and 50% by Polenergia. The total potential value of these contracts to Cadeler is expected to be in the range of EUR 120-144 million, with operations scheduled to begin in 2027.

The Baltyk 2 and Baltyk 3 offshore wind farms will be located in the Baltic Sea, approximately 22 km and 37 km, respectively, from the port of Łeba, Poland. The projects will involve the installation of a total of 100 offshore wind turbine generators (WTGs) in the Polish Baltic Sea.

Cadeler plans to deploy both an O-Class and a P-Class vessel for the projects. Given the complex nature of the project, Cadeler is deploying an innovative dual-vessel setup, offering the exclusive flexibility the client needs to meet their capacity targets while showcasing the advantages of having the largest, most versatile, and capable fleet of jack-up vessels in the industry.

The installation of WTGs is set to begin in 2027. Once operational, the two wind farms are expected to generate a combined capacity of 1440 MW, providing electricity equivalent to the needs of more than two million households. The aggregate potential value of the contracts to Cadeler is anticipated to fall within the range of EUR 120-144 million.

Mikkel Gleerup, CEO of Cadeler, said: "We are excited to announce a firm contract for yet another significant milestone project in Poland. This marks our third major project in the Polish market, showcasing the strong business potential in that market, driven by increasing demand for renewable energy. We are proud to support our partners in accelerating the transition to sustainable energy, with these projects ultimately benefiting more than two million households. Additionally, this is our first firm contract with Equinor and Polenergia, and we look forward to working closely together to set the stage for future successful collaborations."

More impact with less Jacking grease

Proven results

- Reliable protection of equipment
- >25% less handling & maintenance
- Up to 30% volume reduction



More impact with less



Properties

- Extreme load capacity
- Good pumpability in your systems
- Certified biodegradable & OEM-approved
- Worldwide available

Would you like to know more?

Ask for the white paper and let's get in touch!



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BMT AND STRATEGIC MARINE UNVEIL SUSTAINABLE STRATCAT35 CTV AT WINDENERGY HAMBURG

Working in partnership with Strategic Marine, BMT is proud to introduce its latest addition to the offshore wind industry: the StratCat35 Crew Transfer Vessel (CTV). This cutting-edge vessel, making its debut at WindEnergy Hamburg, is designed to meet a wider range of operator requirements while placing sustainability at the forefront of the offshore wind sector.

As part of Strategic Marine's range of CTV vessels, the StratCat35 delivers significant advancements in both design and functionality. At 35 metres in length, this vessel offers an expansive deck area, significantly improving storage capacity and enhancing operational versatility by allowing more working space. The proven BMT Z-Bow hull form provides superior seakeeping in harsh offshore conditions, while also improving vessel speed and overall performance.

A key innovation of the StratCat35 is its state-of-the-art

hybrid propulsion system, designed to minimise greenhouse gas emissions and enhance fuel efficiency. This is further supported by the vessel's methanol-ready configuration, offering future-proofing through easy adaptation to alternative fuel technologies as they become available, eliminating the need for costly retrofits.

Additionally, the StratCat 35 incorporates BMT's latest generation active fender system®, ensuring safer and more efficient technician transfers in challenging sea conditions. The vessel is also equipped with high-comfort accommodation and dedicated spaces for technicians and crew to ensure optimal comfort during transit. The design places considerable emphasis on workflow and life on board in general, optimising spaces for efficient operations and ensuring a comfortable environment for up to 36 passengers and 10 crew members.





**MARINE
CONTRACTORS**

Huisman

LOAD-OUT OF THE MOTION COMPENSATED GRIPPER FRAME AT OUR QUAYSIDE IN SCHIEDAM, NL.

This cutting-edge mission equipment will be installed on the SSCV Thialf, enabling the installation of monopiles up to 12.5 meters in diameter in water depths ranging from 23 to 40 meters. This motion compensation technology plays a significant part in enabling the energy transition, making possible the construction of tomorrow's offshore wind farms.



FIRST FOUNDATIONS FOR RWE'S DANISH OFFSHORE WIND FARM THOR ARRIVE AT EEMSHAVEN PORT

- Buss Terminal Eemshaven to be used for the handling of 72 monopile foundations
- Foundations weighing up to 1,500 tonnes each – as much as 1,000 small cars
- Offshore installation in the Danish North Sea expected to start in spring 2025

Essen, 22 October 2024

RWE has taken an important step in the construction of its offshore wind project Thor in the Danish North Sea: the first batch of eight monopile foundations for the wind turbines were offloaded and stored at the base port of Eemshaven in the Netherlands. The monopiles are up to 100 meters in length and weigh up to 1,500 tonnes each. This is roughly equivalent to the weight of 1,000 small cars. A total of 72 of these foundations will be handled in Eemshaven.

Thomas Michel, COO RWE Offshore Wind: "The arrival of the

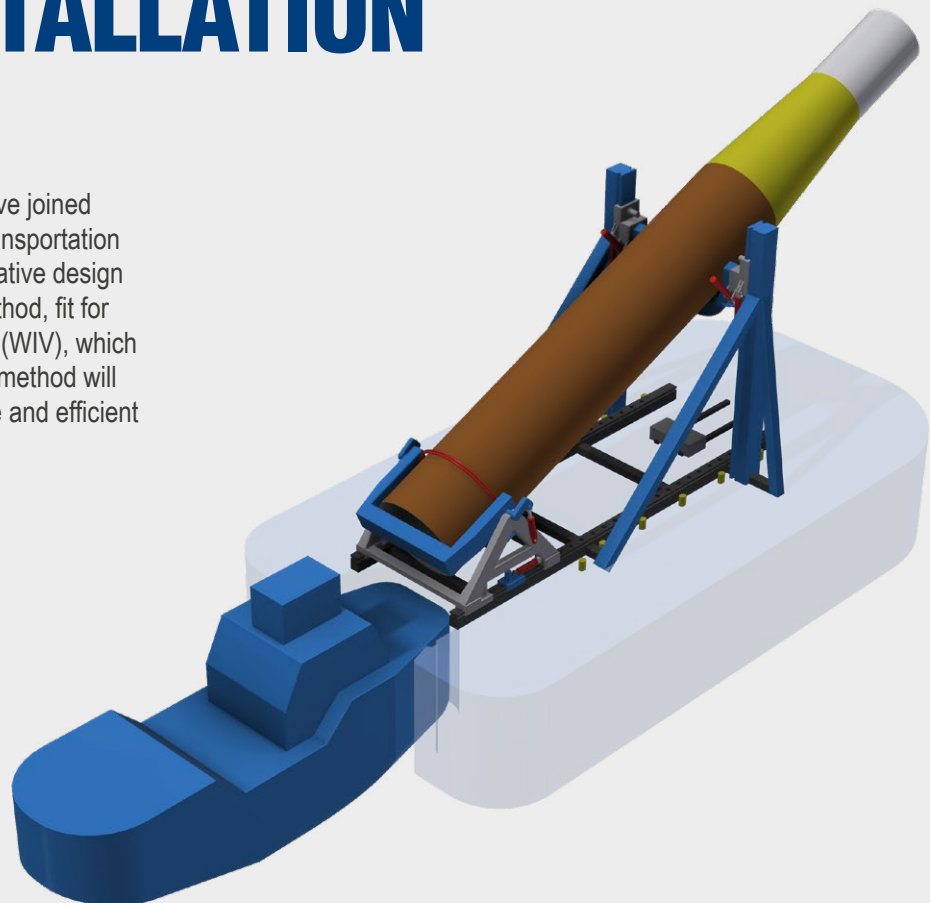
first batch of monopiles at the port marks an important milestone in the delivery of our Thor project – Denmark's largest offshore wind farm to date. The construction of offshore wind farms requires large port capacity and special port infrastructure to handle the heavy components. Such capacities are becoming increasingly difficult to find. We are delighted to have secured the Buss Terminal once again. The facilities at Eemshaven port are ideal. We recently used the port to support the construction of our Kaskasi wind farm."

Buss Terminal Eemshaven, part of the Hamburg-based Terminal operator Buss Ports, provides storage space, heavy unloading equipment and operators at the port, whilst also managing the port logistics. In spring 2025, foundations will be shipped from the Dutch heavy-lift terminal in Eemshaven to the Thor construction site in the Danish North Sea, located approximately 22 kilometers off the west coast of Jutland.



A NEW MONOPILE T&I CONCEPT FOR MAERSK WIND INSTALLATION VESSEL

TWD and Maersk Offshore Wind have joined forces to design a new Monopile Transportation and Installation Concept. This innovative design introduces an efficient feeding method, fit for the Maersk Wind Installation Vessel (WIV), which is currently under construction. The method will enhance operability and ensure safe and efficient MP installations.





ENTRION WIND AWARDED PATENT FOR DEEP WATER MONOPILE TECHNOLOGY



Entrion Wind announced the issuance of a U.S. patent for its innovative Fully Restrained Platform (FRP) monopile.

Officially granted by the U.S. Patent and Trademark Office on October 29, 2024, the patent is the first of six filed by Entrion Wind to be awarded, marking a major milestone in the company's ongoing efforts to revolutionize offshore energy technology.

Entrion Wind's revolutionary design of the FRP monopile extends the range of traditional monopile technology up to 100 meters water depths, while offering improved economics compared to other foundation systems. The design integrates proven technologies with Entrion Wind's proprietary Top Mooring Assembly (TMA) system. The TMA improves the stability of the monopile by increasing stiffness without impacting installation or operational efficiency.



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

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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
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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.





ENSURING STABILITY: SCOUR PROTECTION FOR SUCTION PILES IN OFFSHORE WIND FARMS

As the offshore wind industry continues to grow, ensuring the stability and longevity of our structures is more crucial than ever. One key challenge we face is scour – the erosion of sediment around underwater foundations, particularly suction piles that support wind turbines.

Why is Scour Protection Essential?

Scour can lead to significant structural issues if not addressed, risking the integrity of turbine foundations and ultimately impacting energy production. Effective scour protection is vital for:

- **Maintaining Structural Integrity:** Preventing sediment displacement around suction piles ensures they remain securely anchored and stable.
- **Enhancing Operational Efficiency:** A well-protected foundation contributes to optimal turbine performance and reduces maintenance needs.
- **Promoting Sustainability:** Protecting our offshore structures minimizes environmental impact and supports marine ecosystems.

Innovative Solutions

At Ridgeway Rockbags®, we are dedicated to implementing cutting-edge solutions for scour protection. Our approach includes utilizing advanced materials and techniques tailored to withstand the harsh marine environment while ensuring minimal disruption to local ecosystems.

Join Us in Leading the Way!

We believe that by prioritizing scour protection, we can enhance the resilience of offshore wind farms and contribute to a sustainable energy future. Let's work together to harness the power of wind while safeguarding our marine environments!



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

An aerial photograph of a large offshore construction vessel, likely a jack-up rig, positioned in the sea. The vessel is white with blue and orange accents. A large red and white lattice crane is mounted on the deck, extending upwards. Several white pipes or cables run along the side of the vessel. The water is a deep teal color.

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 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**

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





Photo by: Gareth Rowland



POWERING CLEAN ENERGY FROM OCEAN WAVES AS M4 DEPLOYED IN ALBANY

The M4 (Moored MultiModal Multibody) Wave Energy Converter (WEC) has successfully been deployed into King George Sound in Albany WA and has begun transmitting data on the power generation from ocean waves.

Over the next six months, the 22-metre, 42-tonne, surface-riding device is expected to generate renewable energy from wave motion while gathering crucial performance data, providing insights into the technology's effectiveness as a clean energy source for Australia's Great Southern region.

This marks a step in Australia's efforts to harness renewable energy from wave motion with the device designed to capture wave-generated energy while providing data on its efficiency and potential as a sustainable energy source.

"It is a world-first, a fully open-sourced wave energy generator for which all data gathered during the operation will be displayed on the specific website and be made available to the public domain," MERA and UWA Oceans Institute Director, Christophe Gaudin.

"By doing so, we plan to uplift the whole ocean wave energy industry, sharing the lessons learnt during the project and bringing confidence to investors and users. As such, this project is of international significance".

NEW MILESTONE ACHIEVED!

Successful testing of
IceCube's Desalination System
at NAVFAC testing facility



NEXT STOP >>>



September 17th 2024
Port of Hueneme, California



IceCube unit at
Fathomwerx Summit 2023

ONEKA TECHNOLOGIES, EXCITING MILESTONE ACHIEVED!

We're thrilled to announce that our Icecube's desalination system successfully completed a rigorous 30-day test at the Naval Facilities Engineering Systems Command (NAVFAC) at Port Hueneme, California.

Key Results

- Over 750 hours of continuous operation without failure.
- Water quality consistently below 500 TDS, meeting WHO standards.

This test allowed us to gather critical operational data from a recognized third-party operator and gain valuable feedback on system performance, failure points, and improvement opportunities.

Next stop FATHOMWERX Summit on September 17th, where we'll be showcasing the Icecube unit and performing a live demonstration of our data acquisition system (DAQ).

MTU WAVE

MTU Wave is the collaborative wave tank lab at Michigan Technological University dedicated to advancing R&D in the field of floating or underwater offshore technologies.

Capabilities

- ✓ 10m x 3m x 1m concrete and glass basin
- ✓ 8 independently controlled paddles with force feedback.
- ✓ Regular and irregular wave generation.
- ✓ 0.8 - 3.3 second period waves (0.3 - 1.3 Hz)
- ✓ 0.25 m maximum wave height.
- ✓ Overhead access and walkway.
- ✓ Custom wave field creation/analysis.
- ✓ Numerical modeling & analysis.
- ✓ Control systems design and real-time implementation.



Instrumentation

- » Low-friction testbed available for buoy/PTO testing within the tank. Equipped with voice coil actuation and non-contact position and force sensing.
- » Buoy dynamometer, Stroke: 200mm, Max Speed: 25.4 mm/s, Max. Force: 222N for hydrodynamic model validation
- » 11-camera Qualisys motion capture system
- » 16 resistive wave gauges
- » dSPACE MicroLabBox
- » Synchronized data collection
- » Overhead-mounted, 6-axis Universal Robots UR10e for force or position manipulation of objects in the wave tank

**Apply for
Testing**

Deadline: October 4th

 **TEAMER**
Testing & Expertise for Marine Energy

✉ mtuwave@mtu.edu
🌐 www.mtuwave.org
in www.linkedin.com/company/mtu-wave

Michigan Technological University

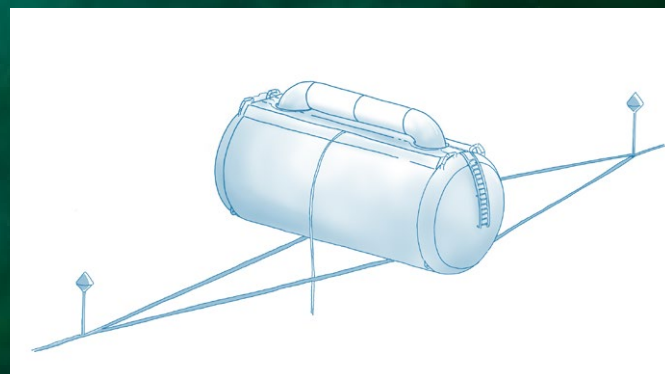


SEATURNS

SEATURNS IS TESTING A CHAIN OF 5 FLOATS FOR THE FIRST TIME IN THE CENTRALE NANTES TEST TANKS

Centrale Nantes recently welcomed SEATURNS to its Centrale Nantes test basins for a series of crucial tests in the EMR sector. The team was able to benefit from the expertise and know-how of the test tanks to test for the first time a chain of 5 connected wave energy systems on a 1/15 scale under various wave conditions. The objective of these tests is to validate this configuration and its anchorings with a view to a future offshore farm.

These tests integrated trajectography measurements to better understand the movements of the floats and correlate them to the performance measurement. These measurements over a large area which covers the entire experimental system are possible with new cameras, financed by Nantes Métropole as part of the WEAMEC Call for Materials Project.



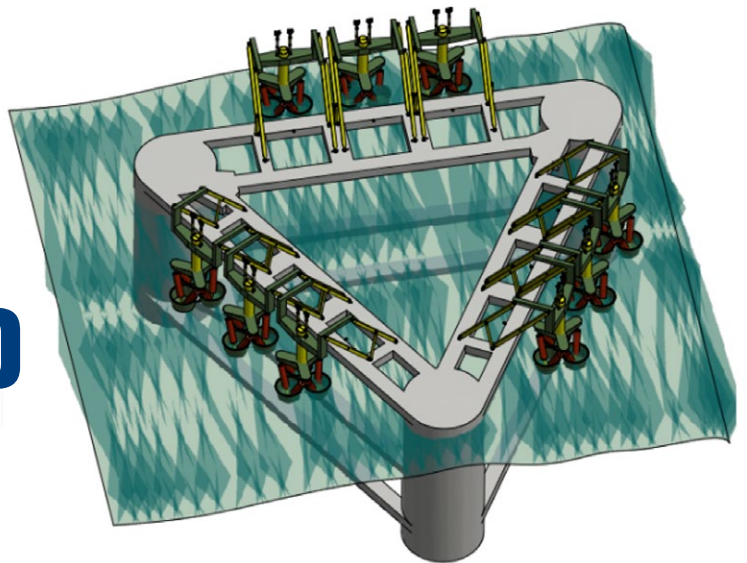
What is SEATURNS?

To capture wave energy and convert it into electricity, SEATURNS has developed a breakthrough wave solution based on an innovative system. This efficient and innovative technology consists of exploiting the technique of the internal water pendulum oscillating in a cylindrical float. It is a simple, compact, robust and small solution. This concept has been patented in France and internationally (South Africa, Australia, China, Europe and USA).

Photo credit: Centrale Nantes



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.

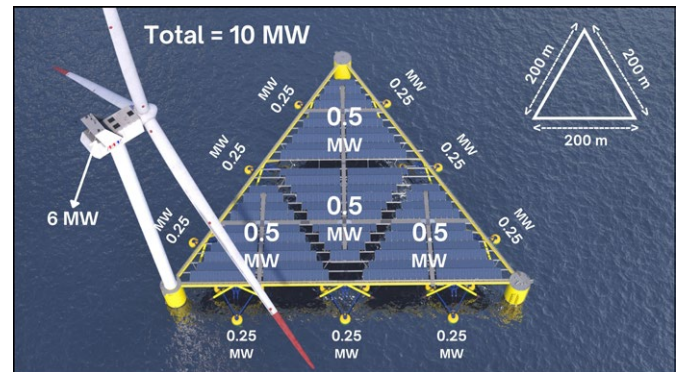
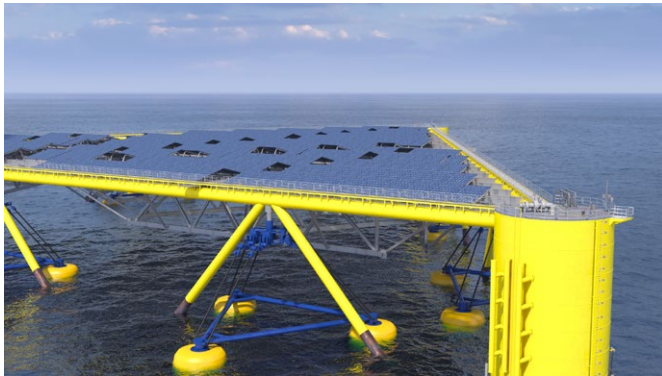
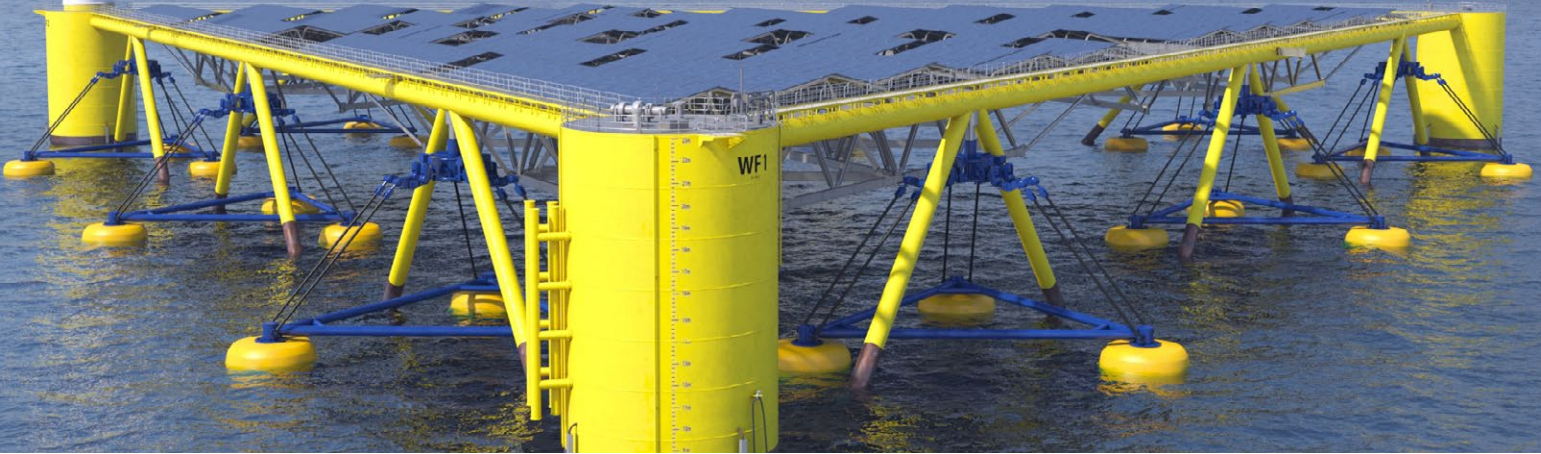
The wavehexapod can make optimal use of the movement of the waves with its 3 buoys. Waves go up and down, but also move in the horizontal plane. With its hexapod structure, the wavehexapod can make optimal use of this 3D movement. Every movement can be converted into energy in this way, in the case of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

10 MW OFFSHORE ENERGY ISLAND!



Using multiple sources of energy, such as wind, solar, and wave power, in offshore environments offers several advantages and helps diversify the energy generation portfolio.

Here are some reasons why these sources are commonly employed:

1. **Resource Availability:** Offshore locations offer abundant renewable energy resources like wind, solar, and wave power. By utilizing these diverse sources, we can unlock the full potential of renewable energy generation.
2. **Redundancy and Stability:** Combining multiple energy sources increases system reliability by compensating for fluctuations or downtime in one source. This redundancy ensures a continuous power supply, reducing the risk of outages and improving overall grid reliability.
3. **Complementary Nature:** Wind, solar, and wave power complement each other due to their different characteristics. Wind energy is stronger in the night and winter, solar energy is abundant during the day and summer, and wave power is more consistent year-round. Combining these sources balances out their intermittency and variability, resulting in a more consistent and reliable power output.
4. **Energy Production Optimization:** Integrating multiple energy

sources maximizes energy production by leveraging their different peak generation periods. This integration enables a stable and continuous power supply, optimizing the use of renewable resources and increasing overall energy output.

5. **Environmental Impact:** Offshore renewable energy sources emit minimal greenhouse gases, have low environmental impacts, and reduce dependence on finite fossil fuels. Wind, solar, and wave power offer clean energy alternatives, mitigating climate change and preserving ecosystems when properly designed and managed.

6. **Technological Advancements:** Advancements in offshore renewable energy technologies have made harnessing wind, solar, and wave power more feasible and cost-effective. Ongoing research and development efforts drive innovation, improving efficiency, reducing costs, and expanding the deployment of offshore renewable energy systems.

In the following, we mentioned the companies that activated in this industry, maybe better results can be achieved by the synergy of technologies by these companies. Principle Power, Wind Catching Systems, AE-Wave Hexapod, Eco Wave Power, Slow Mill Sustainable Power BV, SolarDuck, Ocean Sun

Renders created by: Fidar Offshore Animation



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



INYANGA MARINE ENERGY GROUP LAUNCHES CROWDFUNDING ROUND FOR ITS PIONEERING TIDAL ENERGY TECHNOLOGY



Renewable energy innovator Inyanga Marine Energy Group has announced it is launching a crowdfunding round in partnership with Crowdcube.

This round presents an opportunity to invest in Inyanga's patented tidal energy technology, HydroWing.

Tidal energy is a 100% predictable renewable energy source and one of the most reliable sources of renewable energy available. HydroWing aims to unlock the full potential of tidal energy with its patented 'all in one' solution.

In September 2024, HydroWing was awarded the largest tidal energy project in the UK in the government's latest 'Contracts for Difference' allocation round.

This doubles the size of the HydroWing project at Morlais in Wales to 20MW, building on the 10MW awarded in the previous 'Contracts for Difference' allocation round.

The company has also recently won the contract to deliver the first tidal energy plant in Southeast Asia.

Richard Parkinson, CEO of Inyanga Marine Energy Group, said: "We are progressing on our mission to become the world leaders in tidal energy. This crowdfunding round is an opportunity to be part of our exciting journey."

Ocean energy is predicted to have an estimated global value of 53 billion Euros annually by 2050. (Source: Ocean Energy Europe.)

INYANGA MARINE ENERGY GROUP TAKES OVER THE FIRST GRID- CONNECTED TIDAL TURBINE IN FRANCE

It has been announced that Inyanga Marine Energy Group is taking over the D10 tidal turbine in France. The D10 tidal turbine was the first grid-connected tidal turbine in France, initially deployed in 2015.

It is located in the Fromveur Passage, off the coast of Brittany, and provides clean sustainable energy to the remote island of Ushant.

The D10 turbine was previously owned by French company Sabella, which went into liquidation in January 2024. Inyanga Marine Energy Group have now secured permissions to operate the tidal turbine until August 2028.

The Inyanga Marine Energy team, which is headquartered in the UK and has an office in Brittany in France, has managed all offshore operations at the D10 site since 2016.

Diane Dhomé of Inyanga Marine Energy Group said: "All permitting for the D10 turbine has now been renewed. We really appreciate the great support our company received from the Brittany Region and the French Administration. We have a shared vision for the development of renewable tidal energy."

Since its launch in 2015, the D10 tidal turbine has undergone various efficiency improvements and the technology has been validated as well as proven to have no negative impact on the local marine environment. Laid on the seabed at a depth of 55 metres, the machine is 17 metres high and 10 metres in diameter and can deliver up to 250kW of clean electricity to Ushant island grid. It has been operating continuously since its last deployment, managed by Inyanga, in early 2022.

Richard Parkinson, CEO of Inyanga Marine Energy Group, added: "We have been heavily involved in the offshore operations on the D10 for several years and we were saddened by the bankruptcy of Sabella. We are pleased that our takeover of the D10 tidal turbine has now been concluded by the courts and the new deeds are now being drawn up. The future is safeguarded for this iconic tidal turbine, which has enjoyed tremendous support from the local community. It is another exciting milestone for Inyanga Marine Energy Group as we move towards our ambition of being the world leader in tidal energy."

The Fromveur Passage (also known as St Vincent's Channel) has the second strongest tidal current in France and is notorious amongst sailors for its violent currents.

SolarDuck floating offshore solar platform located nearby the Q13-A platform west of Scheveningen. An initiative of the Norwegian-Dutch company SolarDuck.

Photo: Herman Jsseling (Flying Focus BV)

Copyright Flying Focus



THE FIRST OFFSHORE SOLAR FLOATERS ARRIVED IN THE PORT OF AMSTERDAM

These modular, prefab units form part of the Hollandse Kust Noord offshore solar farm that will be installed in 2025.

This will be the largest offshore solar farm installed in the North Sea and the first-of-a-kind offshore solar with offshore wind (and offshore hydrogen) combination.

Supported by the European Commission and the Dutch Ministry of Climate and Green Growth, the deployment highlights a model for future offshore energy integration, combining solar with wind and hydrogen energy production, the Dutch company said.

Oceans of Energy will transport the floaters in 7 MW batches via the IJmuiden sea sluice using light-spec vessels, reducing the need for heavy-lift equipment.

“The Port of Amsterdam is well suited to deploy our system. As we have demonstrated in Belgium earlier this year, our modular system is fast and easy to assemble: it is a matter of only days to assemble a full offshore system from factory into the water,” Oceans of Energy said.

FRENCH FIRM FINISHES FLOATING SOLAR PLATFORM FOR PETRONAS' PROJECT IN MALAYSIA

French renewable energy firm Offsolar has finalized the construction of its 238 kWp floating solar platform for state-owned energy player Petronas' Centre of Excellence for Offshore Renewable Energy (CEFORE) project in Malaysia, marking a step in offshore renewable energy development.

According to Offsolar, the platform is now set to enter its commissioning phase under Petronas' energy transition strategy.

Designed to withstand harsh marine conditions, the floating solar system aims to provide clean and competitive electricity in regions where land availability is limited, Offsolar said.

"This project with the PETRONAS Group represents a key milestone for the AREMA GROUP and demonstrates PETRONAS's confidence in our expertise," said Offsolar in a social media post.

"We are honored to be part of PETRONAS' energy transition and contribute to innovative and accessible renewable energy."

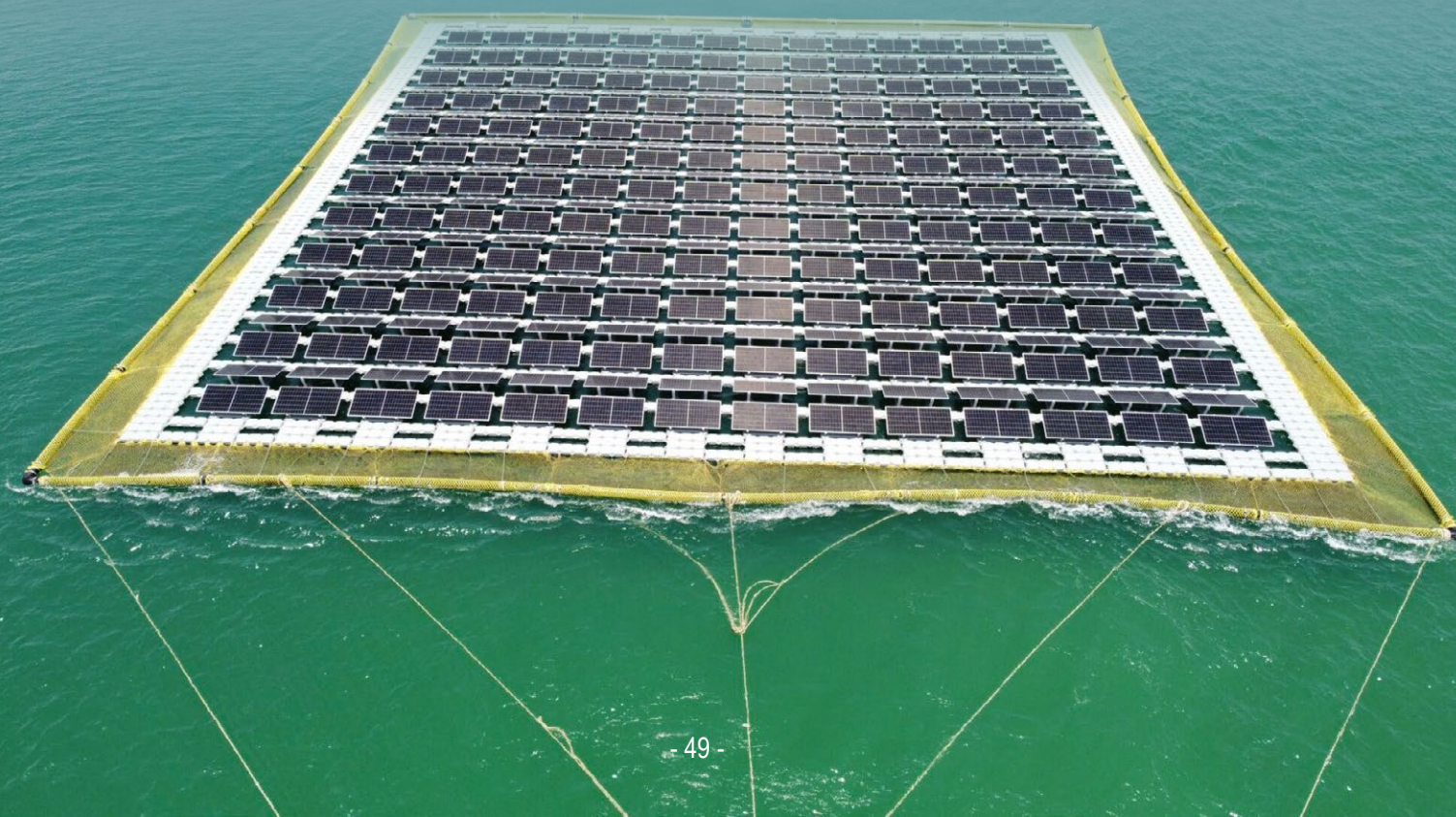
Developed in collaboration with University Malaysia Terengganu (UMT), Schneider Electric Industrial Automation, CITAGLOBAL ENERGY SDN, and Honeywell Energy and Sustainability Solutions, the project aligns with Malaysia's national energy transition roadmap.

UMT described the CEFORE project as an effort to integrate offshore wind turbines, floating photovoltaics, ocean wave energy, and an advanced energy management system into a cohesive renewable energy framework.

"Beyond its immediate benefits, the CEFORE project illuminates the pathway for UMT and PETRONAS to attain remarkable strides within Malaysia's burgeoning renewable energy landscape. Moreover, the electricity generated promises to enrich the lives of not only the UMT fraternity but also the local community, including the vital fishing industry," said UMT.

Offsolar, headquartered in Toulouse, aims to advance offshore renewables with cost-efficient deployment and proven resilience in challenging marine conditions. Tested in multiple regions, the system integrates effectively with offshore wind, aquaculture, and fishing operations, enabling multi-functional use of marine spaces, said Offsolar.

According to Rystad Energy's research, floating solar is poised to play a critical role in Southeast Asia's renewable energy expansion, addressing challenges posed by a lack of suitable sites for onshore solar farms.





THE FIRST FULL-SCALE PROTOTYPE OF XOLARSURF WAS LAUNCHED AT SEA!

XolarSurf is an innovative modular solution for harsh offshore floating solar developed by our Norwegian subsidiary Moss Maritime. It produces electricity from solar panels mounted on floaters, each capable of generating up to 35–45 kWp of installed power. ▮

The prototype is the result of a joint effort between Saipem, Moss Maritime, and Equinor.

A full-scale prototype of the solution developed by Moss Maritime was launched at sea, where it will remain for about one year.

Saipem presented the first full-scale prototype of XolarSurf, a cutting-edge modular solution for harsh offshore floating solar.

The XolarSurf prototype floater, created in collaboration with the Norwegian manufacturer Kystteknikk and other

subcontractors, was lifted and launched at sea at Kystteknikk's facilities in Dyrvik, on the island of Frøya, at the mouth of the Trondheim fjord in Norway.

Design to withstand waves up to 8m, this represents the first full-scale test and a key milestone in the readiness of the product. The prototype is expected to remain at sea for about one year, during which its performance and production capacity will be monitored.

XolarSurf is a modularized floating solar technology developed by Moss Maritime, Saipem's Norwegian subsidiary specialized in design and engineering services for the offshore energy as well as other ocean-based sectors. A full industrialization process has been conducted to exploit the cost reduction associated to repeated and scalable production.

INNOVATIVE WAVE TURBINE - GREEN ENERGY FROM SEA WAVES

WAVE TURBINE

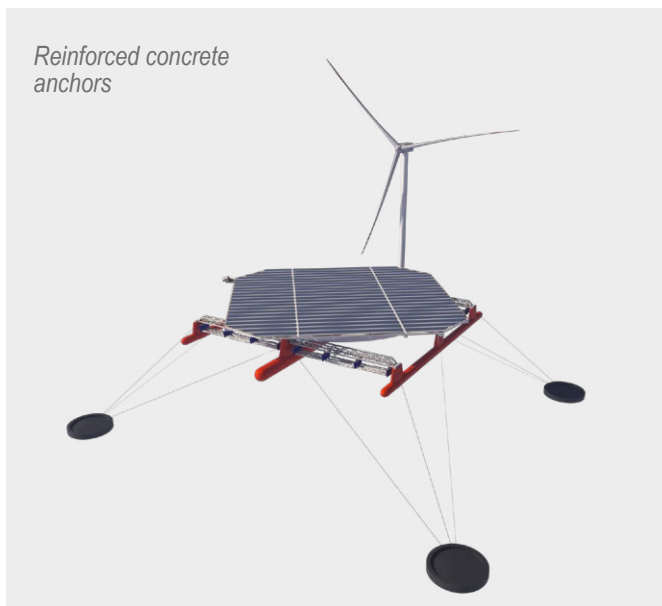
The wave turbine is a groundbreaking project of WUPROHYD design office, thanks to which one will be able to finally harness the huge energy resources from sea and ocean waves. This new RES can boast an estimated capacity of 2.5-3 TW, or 2,500,000-3,000,000 MW.

WUPROHYD design office, as the only one in Poland, has developed and patented this original prototype technology for the use of sea wave energy to produce electricity. Its main element comprises an ingenious wave turbine, i.e. a sea wave converter. At the current stage of the project, the technology development maturity level is RTL4 (according to the Technology Readiness Level), i.e. model tests were carried out for two different profiles of the turbine rotor. The tests confirmed the assumed rotational movement of the turbine rotor under the influence of the circular motion of water particles. The theoretical efficiency was determined at the level of approx. 7%. Therefore, the turbine can easily be used to directly drive power generators.

WAVE TURBINE OPERATION AND CONSTRUCTION

In the current division of wave converters into terminators and attenuators, the wave turbine should be classified as a terminator, i.e. it is situated on the long side parallel to the wave crest (trough) and absorbs the wave energy in a short time. It is composed of a rotor that rotates in relation to a horizontal, stationary axis fixed in the supporting structure, which is oriented parallel to the wave crest (trough) of the wave. The rotor axis is below the water level, enabling it to work fully submerged at a depth at which the circulating movement of the water particles makes it rotate smoothly. The full rotation of the rotor takes place in time equal to the period T of the wave that moves it, in which it absorbs both the kinetic energy and the potential energy of the wave motion.



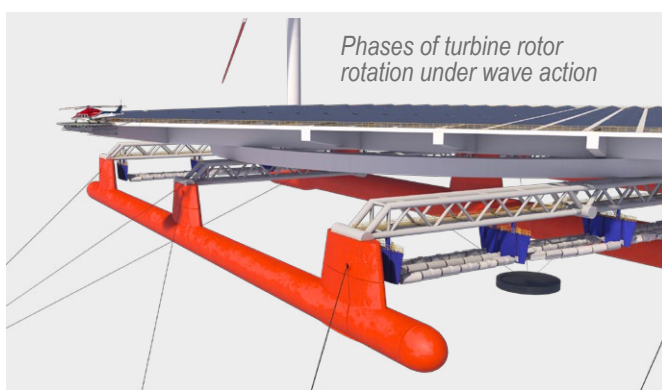


HYBRID OFFSHORE POWER PLANT GUARANTEES LCOE REDUCTION

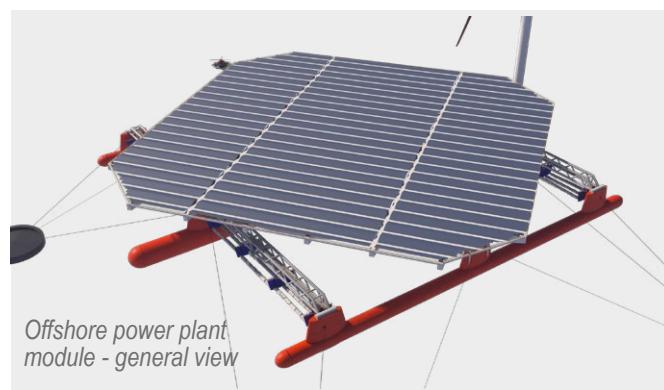
The use of sea wave energy is still a very underdeveloped field. In reality, there are no objects that could be called offshore power plants as far as installed power is concerned. Most of them are just very expensive prototypes, with low efficiency, recovering a small part of the wave energy. The main reason for such state of development of offshore energy is the occurrence of enormous loads due to wave forces in the marine environment, requiring powerful load-bearing structures for devices located on the seabed or floating as well as very complicated converters. Taking into account the very difficult sea conditions and having a simple device for converting the energy of waves, we have designed a floating offshore power plant - an energy island that enables one to harvest huge energy resources of seas and oceans on an industrial scale.

MANUFACTURING TECHNOLOGY

The load-bearing structure of the energy island is designed to be self-erecting and attached to reinforced concrete anchors. The advantage of this solution is that it can be folded, built and equipped as much as possible in a dry dock, which is ingenious, as taking into account its dimensions in an open mode - it would be impossible for the opened structure,. In addition, such a solution reduces the costs of installing the energy island at sea, limiting the use of very expensive floating



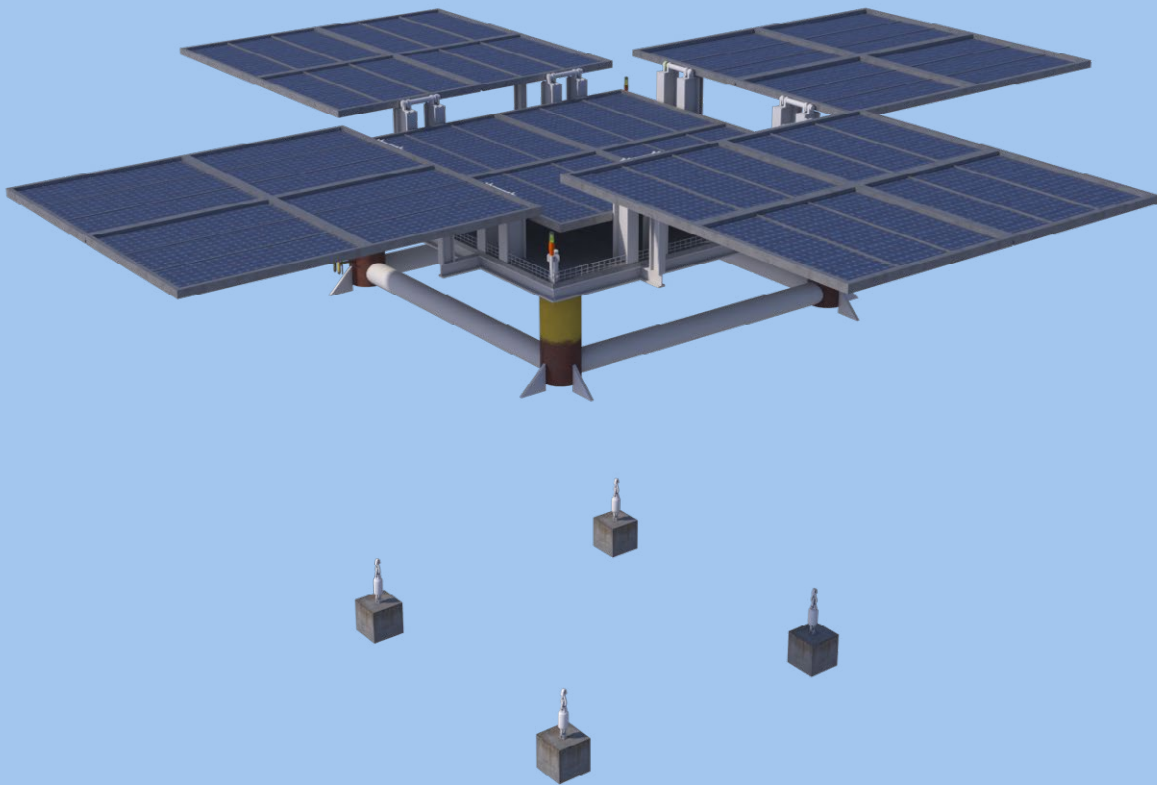
cranes and tugs to the necessary minimum. In order to install smaller pieces of equipment, the structure is equipped with a crane that can move along the track mounted on its trusses. Moreover, the very high stability of the three-hull structure will reduce downtime caused by bad weather conditions related to work at sea. In practice, the adopted production technology requires only a pontoon and a tug for transporting the elements of equipment, which have not been installed in a dock. Reinforced concrete anchors are also designed to be floating. After being towed to their destination, they will be flooded by loading their ballast tanks with water. Anchors, if necessary, will be lifted by blowing the water from the ballast tanks with compressed air.



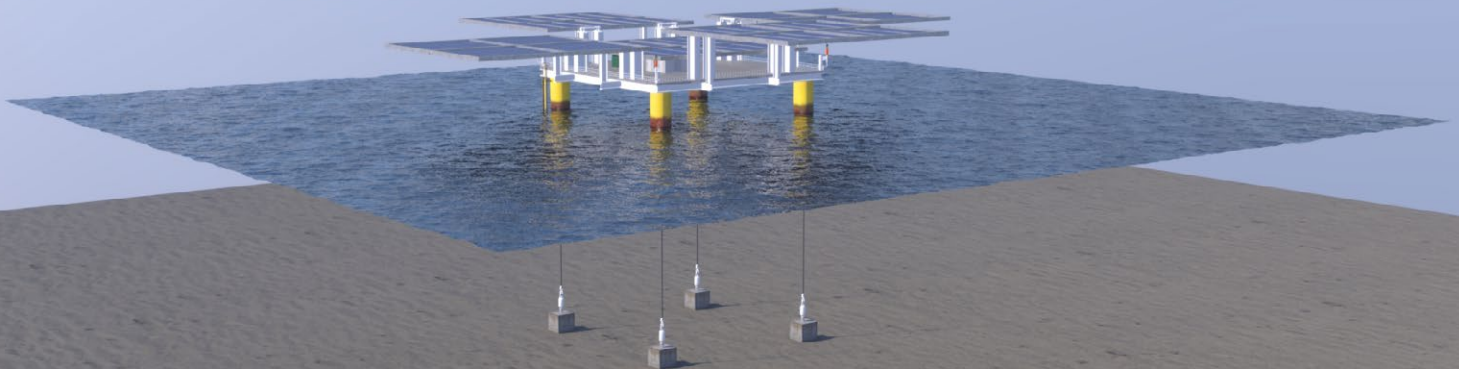
ADVANTAGES OF THE PROPOSED SOLUTION

The energy island designed in the concept phase can be characterised by the following :

- reduction in LCOE compared to other floating objects using only wind and solar energy,
- will generate electricity in a predictable and stable manner from three independent renewable energy sources,
- it is made in the "floating" technology - floating platforms, unlike the previously used foundation solutions used for wind turbines placed on the seabed,
- its structure is independent of the depth of the water on which it is to work. Increasing the depth is related only to the lengthening of the mooring lines, so there is no necessity to make a more powerful foundation structure,
- it can be located at large distances from the shore at great depths so as to eliminate the negative impact of its view on the landscape, which is associated only with the cost of laying a longer cable, and not with a more powerful foundation structure,
- ensures the operation of photovoltaic panels at a low temperature, which increases its efficiency and allows to increase the amount of energy produced thanks to the work in a system "keeping up with the sun", which is unprofitable on land,
- due to its high displacement, it can be used to produce green hydrogen,
- absorbing the energy of sea wind waves, it can be used to protect the sea shore.



- Salinex's Innovative-Offshore Floating Solar PV Plant.
- First of kind for deep offshore Solar PV with inbuilt Solar Panel protection from harsh weather.
- Power generation of 2,272kWp within a 50m x 50m floating semi-submersible.
- Can be provided onsite with Hydrogen / Desalination / BESS systems.
- Dynamic tracking of Solar PV with wave heights
- Safe transit from quay side to site with closed Panels.
- Power generation during sunlight hours, complimenting Offshore Wind farms
- Built in novel Wave Energy Harvester and tidal turbine for extracting clean energy-site dependant.
- Efficient and economical with low LCOE



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

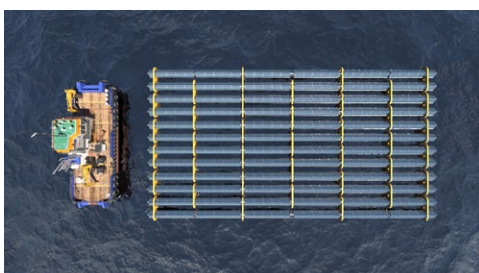
waves have less attack surface. Thus, many photovoltaic projects can from a static point of view with classic modules on land and on water realized only at high cost.

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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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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We are a creative international team of Storyboard writers, 3D artists, offshore structural specialists and animators with one goal – creating memorable and sophisticated visual stories that can boost your brand in no time. Our focus is on Offshore Renewable Energy sector. In our team, work quality is given utmost importance. Each work is carefully crafted and undergoes strict Quality Control to ensure results that go beyond expectations.



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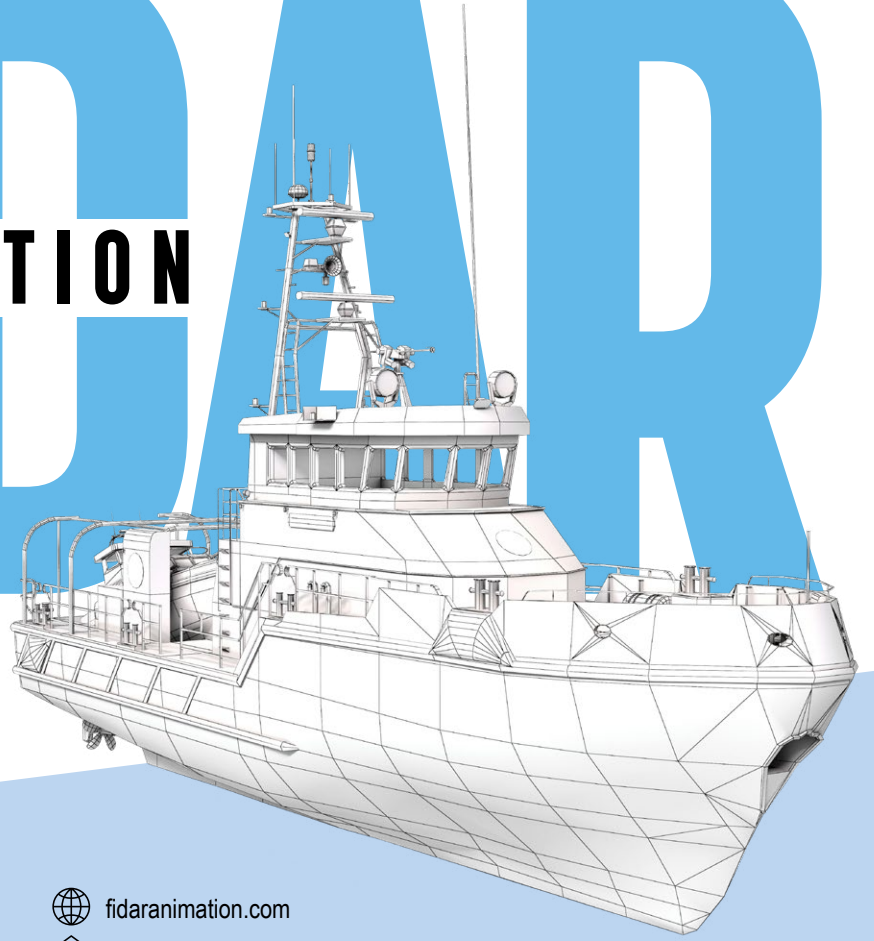


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