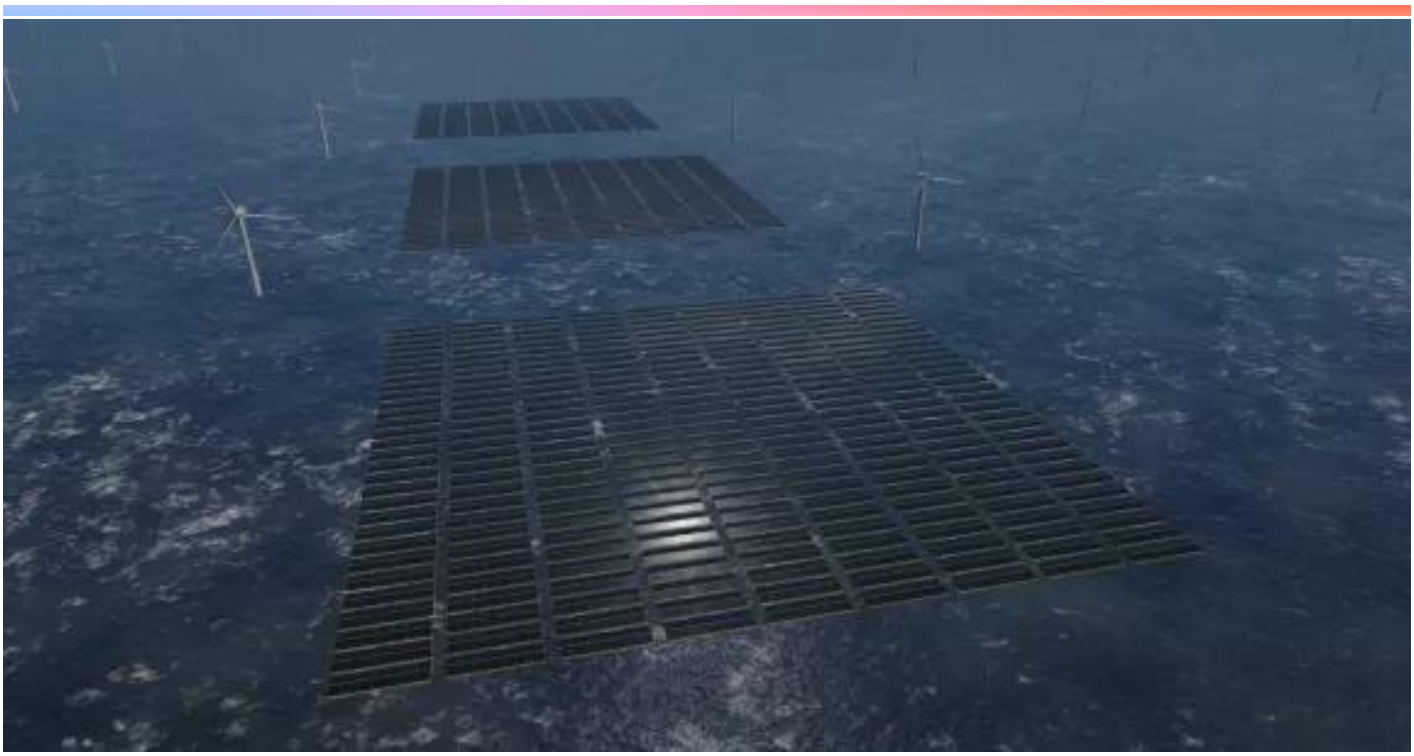
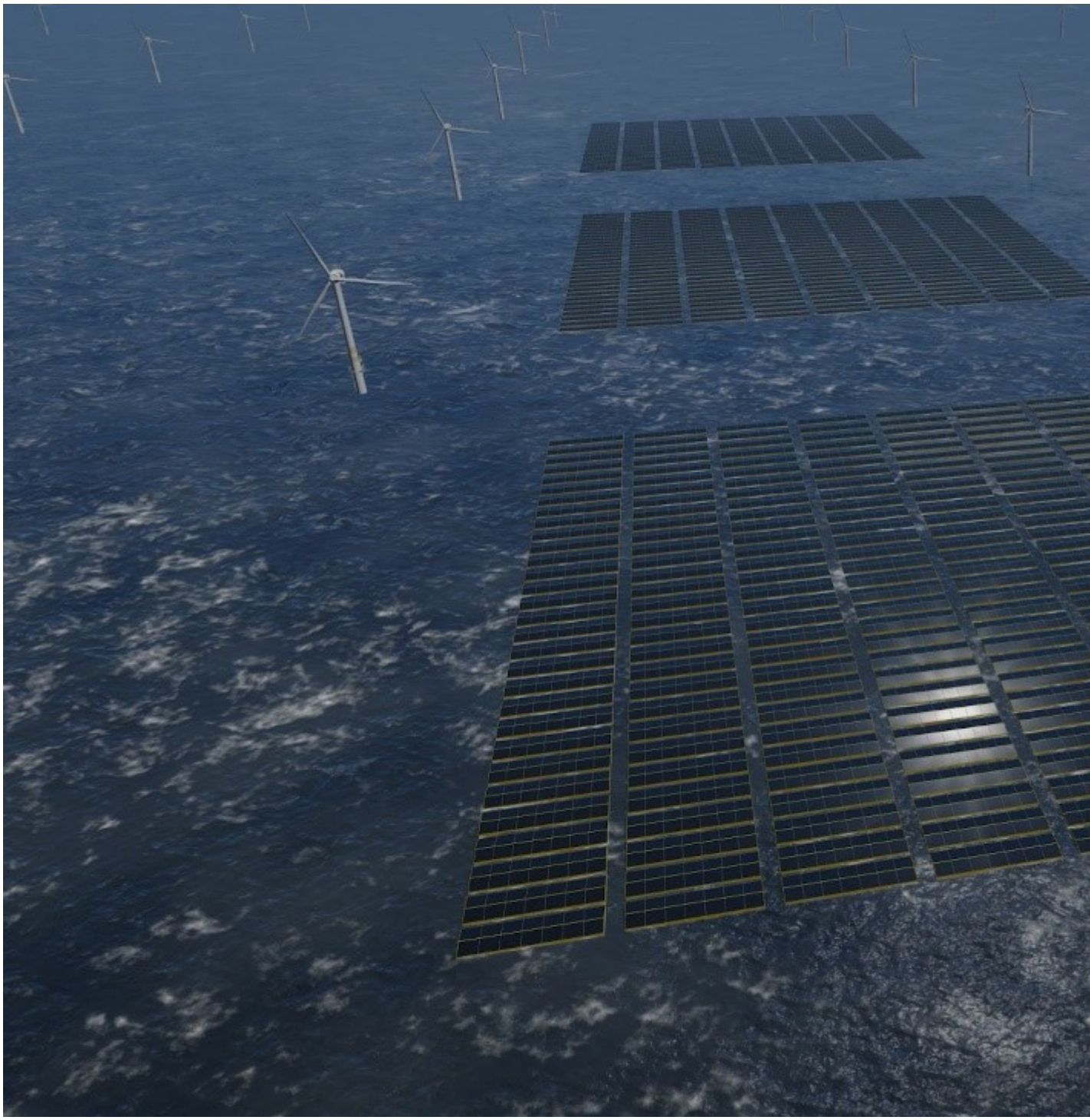


Offshore solar scaling up to Gigawatts

13 February 2024, 17:07

Oceans of Energy and 15 leading European partners start project to scale up offshore solar

Sassenheim, The Netherlands; February 12, 2024 – Oceans of Energy together with fifteen leading European partners announce the start of an EU Joint Industry Project, in which offshore solar technology is scaled up to standard formats of 150 MW enabling to build Gigawatt scale farms. These building blocks are to become a new standard in offshore energy farms. Placing solar farms within offshore wind farms makes better use of the sea space, increases energy output, provides more continuous power over the seasons, and will drive down costs for green electricity production and the energy system.



Rijkswaterstaat
Picture showing three 150 MW offshore solar standard formats in-between offshore wind turbines

“Oceans of Energy is proud to advance offshore solar further towards a real gamechanger in the renewable energy transition, by bringing these standardized, large scale offshore solar farms to the world,” says Allard van Hoeken, Founder and CEO of Oceans of Energy. He continues: *“Offshore solar is becoming a major contributor to the energy transition in the North Sea. We are kickstarting the development of a standardized offshore solar building block, which fits right in-between four offshore wind turbines. This allows for optimized multi-source offshore energy farms without competing for scarce and limited land space.”*

Oceans of Energy is a pioneer in offshore solar, the company deployed the first in the world offshore solar farm for high waves in the rough Dutch North Sea in 2019. The company is building the first offshore solar farm to be installed within the Shell/Eneco Hollandse Kust Noord offshore wind farm in the North Sea. Its mission is to bring clean and abundant renewable energy in harmony with nature to people living along the coasts worldwide.

The partners

The collaboration coordinated by RINA, between offshore solar developer Oceans of Energy, four technology developers (Solarge, TKF, Pauwels Transformers, SolarCleano), five technical- and environmental consultancies (RINA, ABS, Aquatera Ltd, Aquatera Atlantico, and WavEC), three testing laboratories (MARIN, Fraunhofer CSP, SIRRIS), the marine science-policy think-tank European Marine Board, and the offshore wind farm developer Vattenfall as potential client for implementation, is aimed to resolve remaining challenges for the rollout of large scale offshore solar into new- and existing wind farms. This includes proving the robustness and performance of the solar panels in offshore conditions, as well as researching the impact on the environment while securing sustainability in the whole value-chain of this emerging industry.

“This project will contribute to enable feasible business cases of solar renewable energy offshore”, states Andrea Bombardi, Carbon Reduction Excellence Executive Vice President of RINA. “RINA, thanks to the leading experience in the provision of energy yield assessment services for solar plants and in floating offshore systems, will pioneer the development of a new predictive yield model applicable to this emerging technology. We will bring to the project our competence in ground-native solutions offshore, in static and dynamic analysis on dynamic export cables, in comparative analysis between different power export layouts, in the definition of recycling strategies for PVs and electrical components at the end of their life, and in the coordination of EU-funded projects.”

BAMBOO

The envisioned result is that project BAMBOO (Build scAlable Modular Bamboo-inspired Offshore sOlar systems) matures the technologies and allows for attracting the funds for the first of a kind 100-200 MW offshore solar farm at a Vattenfall offshore wind farm before the turn of the decade. At which wind farm (development) this will take place still has to be decided.

Lower investments in total energy system predicted

The complementarity of energy patterns of a co-located offshore solar and wind farm allows the farm to use the same grid connection more efficiently, thus reducing the need for investments in expanding the energy system. In addition, the space needed, both on land and at sea, for generating renewable energy can be drastically reduced by using the offshore wind farm space for solar as well. Moreover, the increased scale of offshore solar farms can reduce their environmental impacts per installed capacity, through a minimal need for anchors on the seabed and centralizing the electricity export cable in a larger floating island.

Support in the development of international standards

The project will contribute to the development of international standards and testing methodologies for offshore solar technology. For this, the innovation program will conduct hydrodynamic assessments at MARIN, climate chamber tests at SIRRIS, tests for PV panels at Fraunhofer, and

accelerated lifetime tests based on offshore operations & measurements. Further research will be conducted on predicting and improving the lifetime energy performance. There will also be a focus on measuring and predicting the environmental impact of the technology, including through methods for contributing to nature enhancements and for end-of-life strategies. Furthermore, the activities aim towards internationally aligned policies including for environmental assessment criteria frameworks.

bamboo

Funded by
the European Union

About Oceans of Energy – www.oceansofenergy.blue

Oceans of Energy is the pioneering company that brought Offshore Solar in high waves from a (perceived) impossibility to a reality. Founded in 2016, this Dutch company has since grown to sixty employees, and has proven its offshore solar solution in the North Sea since 2019. Oceans of Energy offers standardized integrated offshore solar farm hardware, EPCI-services for installation and commissioning, Asset management services and broad environmental expertise. The company has attracted €30 million in funding so far. Projects include the offshore solar innovationat the Crosswind (Shell & Eneco) Hollandse Kust Noord offshore wind farm and are amongst others supported by RVO, MIT-Zuid-Holland, REACT EU, INTERREG, Horizon-2020, Horizon Europe programs.

About RINA - www.rina.org

RINA, leading certification company and engineering company in Italy, provides a wide range of services across the Energy, Marine, Certification, Infrastructure & Mobility, Real Estate, and Industry sectors. With revenues in 2022 of 725 million euros, 5,300 employees and 200 offices in 70 countries worldwide, RINA is a member of key international organizations and an important contributor to the development of new legislative standards.

About Pauwels Transformers

From its established manufacturing base in Belgium, Pauwels Transformers spans all over the globe and along with its listed parent group “EIC” companies employs more than 1.600 employees worldwide. With more than 75 years’ experience in the design , manufacturing and services of high-quality, cost-efficient electrical equipment, Pauwels Transformers also offers extensive services in all related fields, focusing on liquid-filled distribution and power transformers turnkey electrical transmission solutions. The company is an established reputable and reliable partner in electrical power engineering, using the most advanced technology and the highest production standards.

About Solarge International

Solarge is a leading innovator in sustainable solar energy solutions. The company specializes in manufacturing sustainable, lightweight products suitable for installation on rooftops with limited load-bearing capacity, eliminating the need for extensive roof reinforcement. It prides itself on the ultra-low carbon footprint and on the circularity of its solar panels, which are designed with full sustainability in mind. Composed of premium lightweight materials developed in close cooperation with SABIC, these panels can be fully recycled at the end of their 25-year lifespan to produce new solar panels. Founded in 2018, in Weert, The Netherlands, Solarge is currently one of the leading suppliers of lightweight solar panels in Europe, with the ambition to grow its global footprint. At Solarge, energy transition and sustainability sit at the heart of our vision, ensuring we optimize the power of the sun to foster a livable planet.

About Twentsche KabelFabriek / TKF

Since its founding in 1930, TKF has developed towards a technologically leading supplier of connectivity solutions. TKF designs, manufactures and delivers low-, medium- and high- voltage cable solutions which enable the energy transition. With this complete portfolio of cables, systems and services, we offer customers worldwide innovative and sustainable solutions for creating safe

and reliable energy and data connections. We make this possible with more than 900 colleagues. TKF is headquartered in the Netherlands. As part of the technology company TKH Group NV, TKF has access to groundbreaking solutions, concepts and technologies.

About SolarCleano

SolarCleano is a Luxembourg-based robotics company that aims to provide innovative robotic solutions for solar panel maintenance. The company was born by combining mechanical design expertise with solid experience in solar panel cleaning. At SolarCleano, we meet challenges with solutions. We constantly update our robotic solar panel cleaning systems and develop predictive maintenance solar technologies to offer customised electricity production efficiency increase to our customers. SolarCleano robots are already active in more than 90 countries on 5 continents, and we are continuously looking to broad our reach to new markets.

About Aquatera Atlántico

Aquatera Atlántico, an SME founded in 2021 and based in the Canary Islands, is the headquarters of Aquatera Group in Europe, offering specialised consulting services in the blue economy sectors, with recognised expertise in blue energy through extensive knowledge acquired during more than 20 years of experience in Aquatera Group projects and initiatives in these sectors around the world.

About Aquatera Limited

Headquartered in the Orkney Islands off northern Scotland, Aquatera Limited is Aquatera Group's flagship consultancy business, providing innovative environmental and sustainability solutions for the future. The integrated Aquatera Group team provides services and support across a wide range of sectors to governments, industry and communities around the world, to encourage and deliver sustainable development of communities and resources whilst appropriately safeguarding its ecosystems, biodiversity, and cultural heritage. The team is actively engaged in delivering strategic, pioneering initiatives delivering energy transition and sustainable development.

About ABS

ABS, a leading global provider of classification and technical advisory services to the marine and offshore industries, is committed to setting standards for safety and excellence in design and construction. Focused on safe and practical application of advanced technologies and digital solutions, ABS works with industry and clients to develop accurate and cost-effective compliance, optimized performance, and operational efficiency for marine and offshore assets.

About Fraunhofer CSP - www.scp.fraunhofer.de

The Fraunhofer CSP, a joint facility of the Fraunhofer Institute for Microstructures of Materials and Systems IMWS and the Fraunhofer Institute for Solar Energy Systems ISE, is your partner for reliability evaluation of solar cells, modules and systems under laboratory and application conditions as well as for chemical, electrical, optical and microstructural material and component characterization. Together with our customers, we develop new technologies, measurement methods, devices, manufacturing processes and product concepts along the entire photovoltaic value chain.

About MARIN

Our aim is to make ships and operations safer, cleaner and smarter and contribute to a sustainable use of the ocean. We want to accomplish this as an independent, reliable and innovative knowledge partner for the maritime sector, government and society. By combining all of our methods we aim to provide solutions for concept development, design and operation. This is why we strive to hold a worldwide leading position in developing, applying and passing on our hydrodynamic and nautical knowledge, and linking this to the related fields. As an independent partner we want to work together and stimulate innovations within the maritime sector as well as in the academic world.

About SIRRIS - www.sirris.be

As the collective centre of the technology industry, Sirris is the trusted reference for technology adoption in Belgium. We help companies to realise their innovation ambitions with hands-on support. At the heart of our services stand over 150 multi-disciplinary experts and a broad set of industrial labs spread over 8 sites, backed by the country's most extensive innovation network. They ensure about 1,300 organisations a year reap the benefits of technological innovation. One expertise area is focussing on energy transition technology in harsh environments. Sirris is also partners of OWI-Lab, an RD&I initiative to support innovation in offshore wind.

About Vattenfall

Vattenfall is a leading European energy company, which for more than 100 years has electrified industries, supplied energy to people's homes and modernised people's way of living through innovation and collaboration. We work to enable the fossil freedom that drives society forward. We are committed to building a future where everyone can choose fossil free ways to move, make and live. Our goal is net zero emissions in our entire value chain by 2040 at the latest. We employ approximately 20,000 people, have around 14 million customers and operate mainly in Sweden, Germany, the Netherlands, Denmark and the UK. Vattenfall is fully owned by the Swedish state. For more information visit: Fossil freedom

About WavEC

Established in 2003 as a private non-profit association, WavEC has been devoted to advancing marine renewable energies (wind and wave energy) and their associated technologies. More recently, it has broadened its focus to encompass emerging domains like ocean monitoring, offshore aquaculture, hydrogen production and storage, and solar energy (in dams and offshore). This expansion aligns with the context of decarbonization, digitization, and circularity. WavEC serves as a central intermediary between science and industry, boasting a comprehensive network of partners and international recognition as a centre of excellence in its field.

About European Marine Board

The European Marine Board (EMB) is the leading European think tank in marine science policy and a unique strategic pan-European Forum for seas and ocean research and technology. As an independent, self-sustaining, non-governmental advisory body, the EMB transfers knowledge between the scientific community and decision makers, promoting Europe's leadership in marine research and technology. We provide a strategic forum to develop marine research foresight,

initiate state-of-the-art analyses and translate these into clear policy recommendations to European institutions as well as national governments.

More information

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