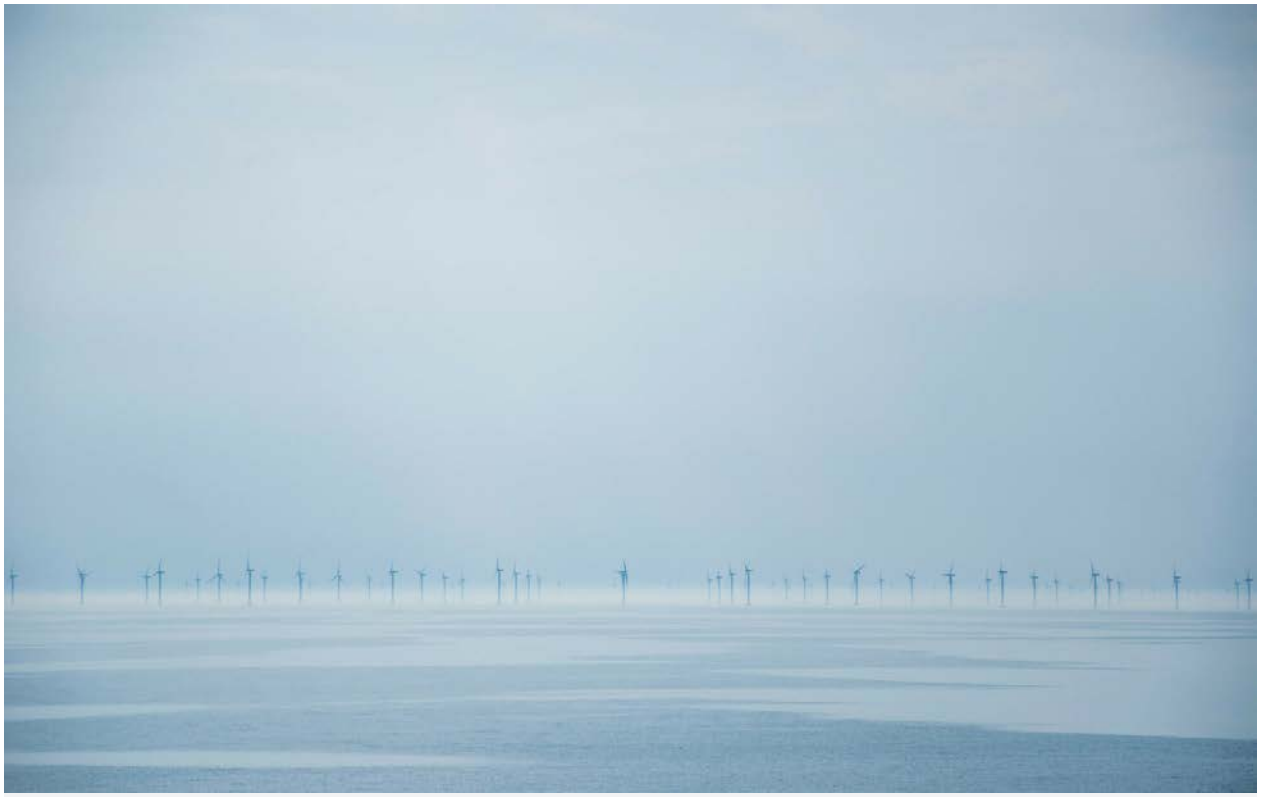


Havfram, an offshore wind services company in Norway, recently announced it has secured an additional $250 million in equity funding. (Courtesy: Havfram)

CONSTRUCTION

Norway's Havfram secures $250M equity funding

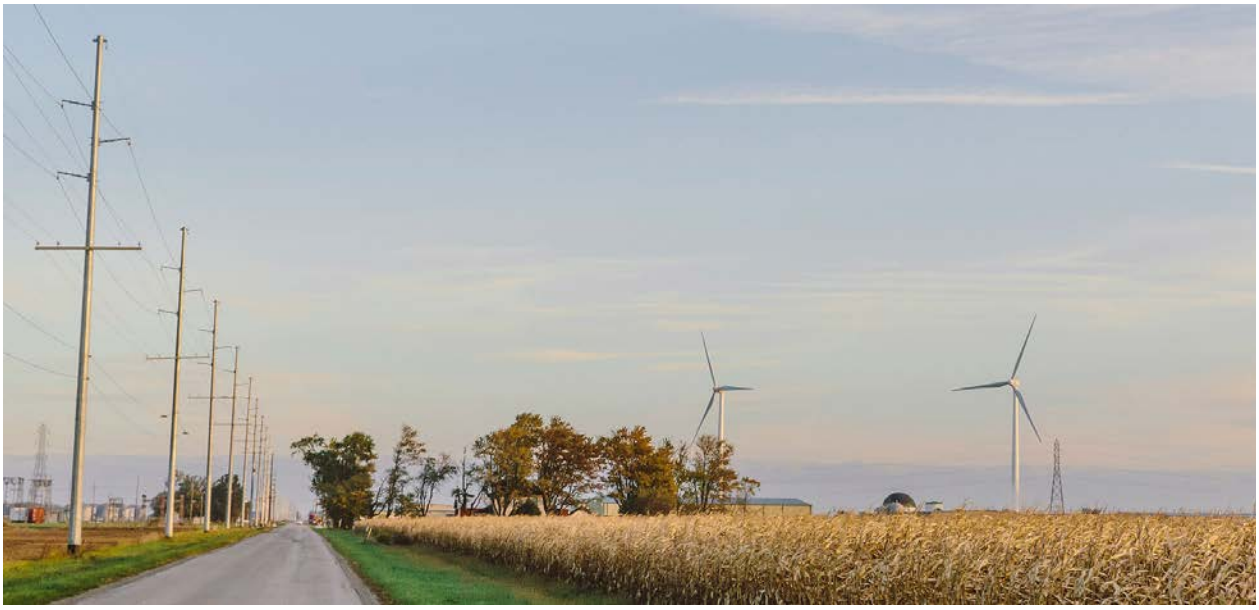
Havfram, an offshore wind services company based in Norway, has secured an additional $250 million in equity funding through a partnership between its primary sponsor, Sandbrook Capital, and Canada's PSP Investments.

The equity funding, in addition to credit financing from commercial banks and export credit agencies, will be used to build a fleet of offshore wind vessels. These vessels, capable of installing turbines reaching more than 300 meters in tip height and foundations of up to 3,000 tons at water depths of up to 70 meters, are among the most critically scarce components of the global renewable energy supply chain.

Havfram's first vessel is under construction, following execution of a shipbuilding contract with CIMC-Raffles. The NG20000X vessel is equipped with a 3,250-ton crane and the latest battery hybrid drive train technology designed to reduce carbon emissions per MW installed by more than 70 percent compared to previous vessel models. The agreement with CIMC-Raffles contemplates the construction of up to four of the vessels.

"I am proud to announce this important milestone for Havfram Wind AS," said Even Larsen, Havfram's offshore wind construction CEO. "With this world-class equipment and one of the most experienced teams in the industry, we are certain that we will be able to provide a first-class service to project owners, turbine suppliers, and construction partners globally. I'm also excited that our vessels will have some of the lowest emission profiles in the industry, as we have designed them to use latest electric battery and energy recovery systems, as well as numerous other sustainability innovations."

"Our planet can't afford delays in the fight against climate change," said Havfram CEO Ingrid Due-Gundersen. "The doubling of our equity funding only a month after Sandbrook's initial investment in Havfram is a testament to the fact that rapid progress can in fact be made when we bring together the right engineering and operational capabilities and specialized investors of scale. We're extremely grateful to Sandbrook and PSP Investments, not just for their trust and financial support, but also for the way they are



Cleveland-Cliffs and EDP Renewables' Headwaters III Wind Farm partnership will afford Cleveland-Cliffs the opportunity to advance its sustainability goals, and enabling EDPR NA to expand its Indiana portfolio. (Courtesy: EDP Renewables)

already leveraging their experience and extensive networks to help Havfram become a leading partner to the global offshore wind industry."

"PSP Investments believes the build-out of the offshore wind supply chain to be part of the solution in addressing climate change and the global shift to net zero," said Patrick Charbonneau, PSP senior managing director and global head of infrastructure investments. "The state-of-the-art vessels built by Havfram will enable the construction of the largest offshore wind turbines to date."

MORE INFO havfram.com

CONSTRUCTION

EDP Renewables signs Indiana wind-farm deal

EDP Renewables SA, through its fully owned subsidiary EDP Renewables North America LLC, (EDPR NA), and flat-rolled steel company Cleve-

land-Cliffs Inc., has executed a 15-year power purchase agreement for 180 MW of the 200-MW Headwaters III Wind Farm in Randolph County. Headwaters III, about 70 miles east of Indianapolis along the Ohio border, is anticipated to be operational in 2025 and will, each year, power the equivalent of more than 54,000 average Indiana homes.

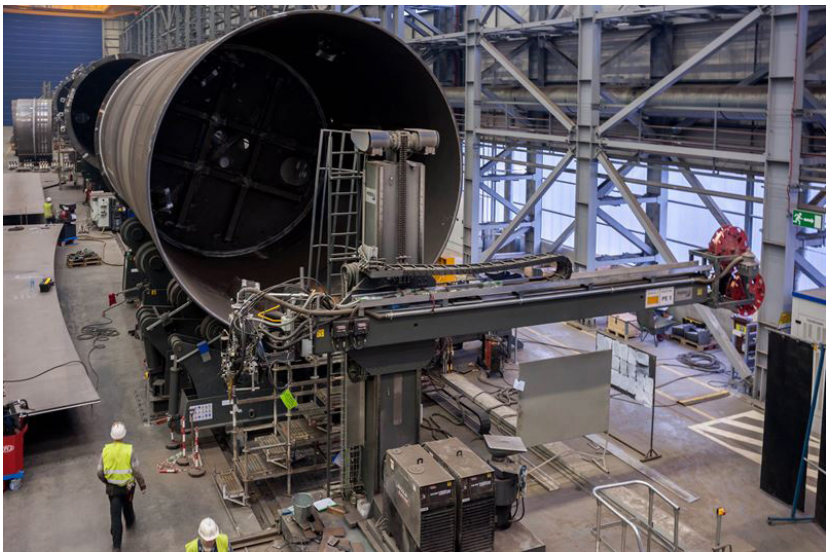
EDPR NA has developed and will construct, own, and operate Headwaters III Wind Farm, which is an extension of the operational 200-MW Headwaters I Wind Farm and the 198-MW Headwaters II Wind Farm in Randolph County. The project will create hundreds of jobs during peak construction and will employ local team members to operate and perform routine maintenance on the wind farm. Additional economic benefits in the form of landowner payments, local government payments, and an increase of money spent at businesses in the vicinity of the project will be disbursed as a result of the wind farm's entrance into Winchester and projected 30-year lifespan. Headwaters III will save about 355 million gallons of water a year, the amount of water that would be needed by conventional generation sources to produce the same amount of capacity as the wind farm. The project will produce clean energy while minimizing impacts on wildlife, habitat, and other environmental resources.

Cleveland-Cliffs and EDP Renewables' Headwaters III Wind Farm partnership will afford Cleveland-Cliffs the opportunity to advance its environmental and social sustainability goals, and enable EDPR NA to expand its portfolio in Indiana, where it maintains its position as the top producer of wind energy in the state.

"A key priority of Cleveland-Cliffs' greenhouse gas reduction strategy revolves around the efficient use of energy and clean energy. We are committed to the greening of the grid through renewable energy projects such as the Headwaters III Wind Farm," said Lourenco Goncalves, chairman, president, and CEO of Cleveland-Cliffs Inc. "This project is another step toward achieving Cleveland-Cliffs' emission reduction goal of 25 percent by 2030 and will advance our portfolio of renewable energy initiatives that are additive to the power grid."

"We are excited to begin our partnership with Cleveland-Cliffs to supply clean energy to support the production of American-made steel for a major American manufacturer," said Sandhya Ganapathy, EDP Renewables North America CEO. "We look forward to the eventual operations of this third phase of the Headwaters Wind Farm, also made possible by our supportive partners in the Randolph County community."

MORE INFO www.edpr.com/north-america



An example of a PEMA wind tower production line. (Courtesy: Pemamek)

CONSTRUCTION

Pemamek to supply wind equipment to Saudi Arabia factory

The Finnish welding and production automation company Pemamek Ltd. has signed a contract with Al Yamamah Steel Industries to supply PEMA onshore wind tower manufacturing lines. The order is a part of the construction project of the Al-Yamamah Wind Energy Systems Factory, Saudi Arabia's first wind-tower manufacturing facility.

The new facility, contributing to local wind-power projects, is being carried out as part of Saudi Arabia's clean-energy transformation and Saudi Vision 2030.

The scope of delivery includes a significant amount of advanced PEMA welding automation equipment designed specifically for high-capacity and safe onshore wind tower manufacturing.

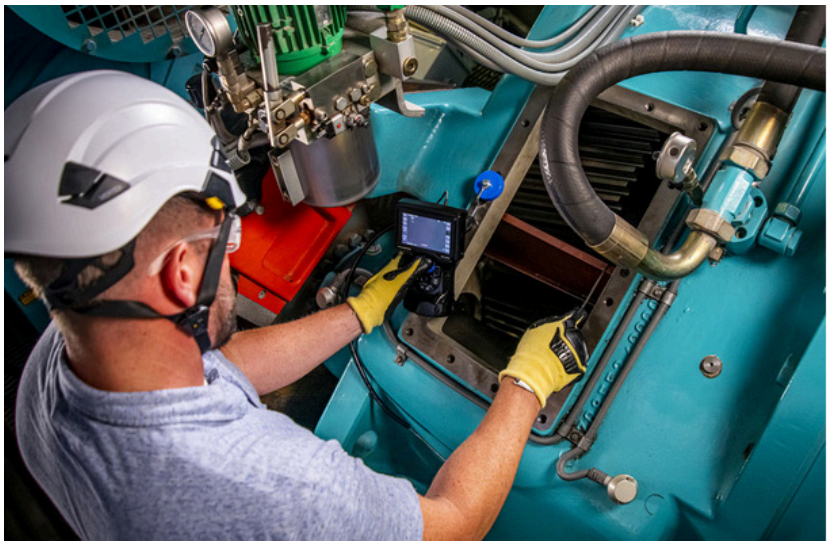
"We are very proud to be elected for this meaningful wind-power project," said Jukka Rantala, Vice President, Key Accounts at Pemamek. "Pemamek has a proven track record in developing highly advanced wind tower manufacturing solutions and now we are excited to create a substantial positive impact on Al Yamamah's production. It is also a big honor for us to help the ambitious Saudi Vision 2030 program with our state-of-art solutions."

Pemamek's delivery to Al Yamamah includes comprehensive project management, acceptance tests, production ramp-up, and training. The agreement includes a service contract with a spare part package, software support, and maintenance support.

MORE INFO pemamek.com

INNOVATION

Videoscope makes wind-turbine gearbox inspections faster



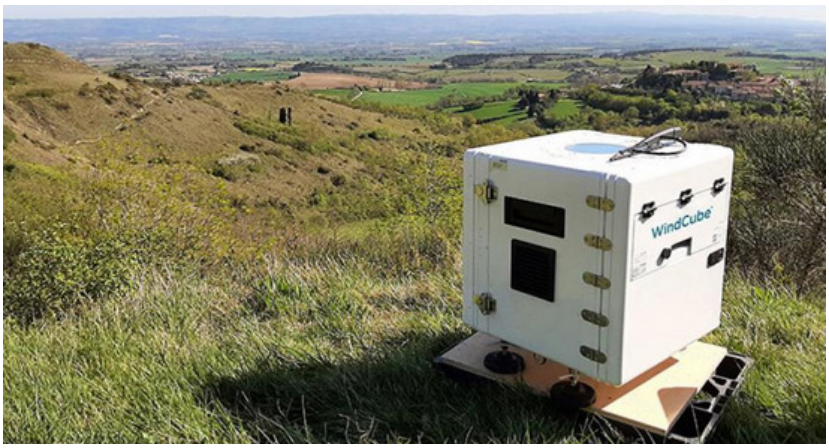
The IPLEX videoscope enables users to visually inspect a gearbox without disassembly. (Courtesy: Evident Scientific)

The IPLEX G Lite-W videoscope combines portability with imaging features packed into a small, ergonomic form. It enables users to visually inspect inside a wind-turbine gearbox without disassembling it to spot issues before they turn into lengthy shutdowns.

Wind-turbine gearboxes contain lubricating oil, which can adhere to the videoscope's lens and cause blurry images. The IPLEX G Lite-W videoscope's sealed tip keeps oil out while channels on the oil-clearing tip adaptor use capillary action to draw oil away from the lens, helping keep images clear.

To reduce the chance of damage during an inspection, the IPLEX G Lite-W videoscope is designed to meet IP65 standards and built to pass U.S. Department of Defense testing (MIL-STD). The insertion tube's durable articulation mechanism helps protect the scope from damage when used in tight spaces.

The videoscope's optics balance the need to see areas of the wind-turbine gearbox up close, such as bearings



Vaisala's WindCube has enhanced features. (Courtesy: Vaisala)

and gear teeth, spot defects in large spaces, and be small enough to fit into the spaces between turbine bearings to look for damage. An optional LED guide tube offers illumination to spot defects in large, dark spaces while the semiflexible guide tube makes it easy to position the videoscope to capture images. Users need one hand to control and maneuver the 4 mm scope to difficult-to-reach areas.

Weighing 1.16 kilograms (2.56 pounds), the compact IPLEX G Lite-W videoscope is easy to carry safely to the top of a wind-tower nacelle. Its ergonomic design enables users to control it while wearing gloves in tight confines. When the inspection is complete, the scope's smooth, oil-resistant coating makes cleaning fast and simple.

MORE INFO www.EvidentScientific.com

INNOVATION

Vaisala announces WindCube Lidar enhancements

Vaisala, a global leader in weather, environmental, and industrial measurements, including wind Lidar instruments for wind energy, recently announced enhancements to WindCube Lidar, including new design features, measurement capabilities, and service and support for optimal Wind Resource Assessment in extreme weather conditions across a diverse array of climates.

With wind farms evolving to include larger turbines, increased heights, and deployment in a wider range of environments and conditions, the latest WindCube enhancements deliver:

- A robust metallic wiper that resists corrosion in harsh conditions, while Vaisala's PTH WXT535 weather sensor delivers measurements of environmental parameters, including wind, rain, temperature, and barometric readings.
- A new winter kit that safeguards the lidar from snow and ice.
- An increased temperature range (50°C) that allows for deployments in the hottest areas around the globe.
- Compatibility with the latest generation of EFOY fuel cell design for off-grid applications.
- A partnership with SmartGrid that enables customers to collect reliable data at remote locations.

Measurement capabilities to ensure data accuracy for increasingly tall turbine hub heights; users now have the ability to compare Lidar data with measurements from an IEC-compliant met mast up to 200 meters.

The new WindCube service agreement streamlines operations, provides online educational resources to stay current on system operations and

management, minimizes disruption, and enables operation and minimal downtime in more global locations.

MORE INFO www.vaisala.com/en

INNOVATION

DNV, Reodor create service for wind-farm decommissioning

DNV, the independent expert in risk management and assurance, is moving ahead in collaboration with Reodor Studios to create a digital service that will make it easy to plan for sustainable decommissioning and recycling when a wind farm has reached the end of its life cycle.

In the 1970s, the wind-power industry boomed, and thousands of wind farms were built around the world. Now, 50 years later, the world faces a historic challenge: What do you do with a 300-ton wind turbine when it has reached the end of its life? ReWind, a brand-new digital service, aims to address this key issue for the wind industry.

Today, most decommissioned wind turbines are buried underground, for lack of a better solution. In 2020, Bloomberg highlighted the situation in Casper, Wyoming, where 870 wind-turbine blades are buried under a landfill. WindEurope estimates that 25,000 metric tons of wind-turbine blades will have to be recycled by 2025, and 52,000 metric tons by 2030.

DNV's specialist team analyzes and develops reports for wind-farm owners and operators, showing, among other things, which materials the wind turbines contain, how they can be disposed of in the best possible way, what can be recycled, and how. Now, in collaboration with Reodor Studios, a Norwegian corporate venture and innovation studio, DNV will shape this into a digital service.

"This service will enable wind-farm owners to quickly assess turbine recyclability percentage and options, end-of-life planning, and sustainable decommissioning," said Matthew Geraghty, founder and ReWind venture lead at DNV.

The use of wind energy will grow, and with that, the need to replace older turbines and equipment to keep pace with developments. Indeed, DNV's 2022 Energy Transition Outlook report forecasts that by 2050, wind will provide almost 50 percent of on-grid electricity in Europe, and 40 percent in North America and Latin America. New turbine types and bigger turbines, blades, and towers will raise capacity factors for onshore wind from 26 percent now to 34 percent, and from 38 percent to 43 percent for offshore wind by 2050.

"This is the first time in history that we have faced such a challenge," said Lucy Craig, director of Growth, Innovation & Digitalization, Energy Systems at DNV. "A wind turbine has a life cycle of around 20 to 30 years, and now, many wind turbines are approaching the end of their life cycle. Today, the process of recycling and decommissioning these

is extremely complicated and manual, and large quantities of wind turbines end up in landfills, for lack of better solutions. Introducing this digital service helps the owner plan for decommissioning, map costs, and assess recycling options."

To create a digital service that meets all its customers' needs, DNV has initiated a collaboration with Reodor Studios. By combining Reodor's expertise in building digital products and services with DNV's world-leading domain knowledge, the ReWind team can work faster, increase the chances of scaling successfully, and build a well-tested service that can make the process of decommissioning wind turbines smoother for wind-farm owners and operators.

"Capital Dynamics Clean Energy is committed to responsible investment and ESG implementation throughout the investment lifecycle," said current customer of the service Gintare Briola, Head of Portfolio Management, CEI at Capital Dynamics. "ReWind's recyclability study for our wind farms helped us gain a better understanding on the recyclability of the equipment, the existing and developing recycling methods, including for composite blade waste, and forecasted decommissioning costs. ReWind also provided recommendations for various stages of the project life cycle that we at Capital Dynamics hope to implement to minimize environmental impact and reduce lifetime emissions."

"DNV, which already has a large customer base of wind-power operators and owners and sits on world-leading knowledge of wind power, has foreseen the need for this service, both through dialogue with the customers, but also through hard data," said Kate Butchart, strategic adviser at Reodor Studios. "Add to that Reodor's creativity and experience in building products and services, and I believe it's a perfect match to create a solution that can potentially solve a huge industry — and global — need."

The digitization project is now ongoing, with the team working on validating market needs, developing a service concept, business model, and a scalable growth strategy based on customer insights.

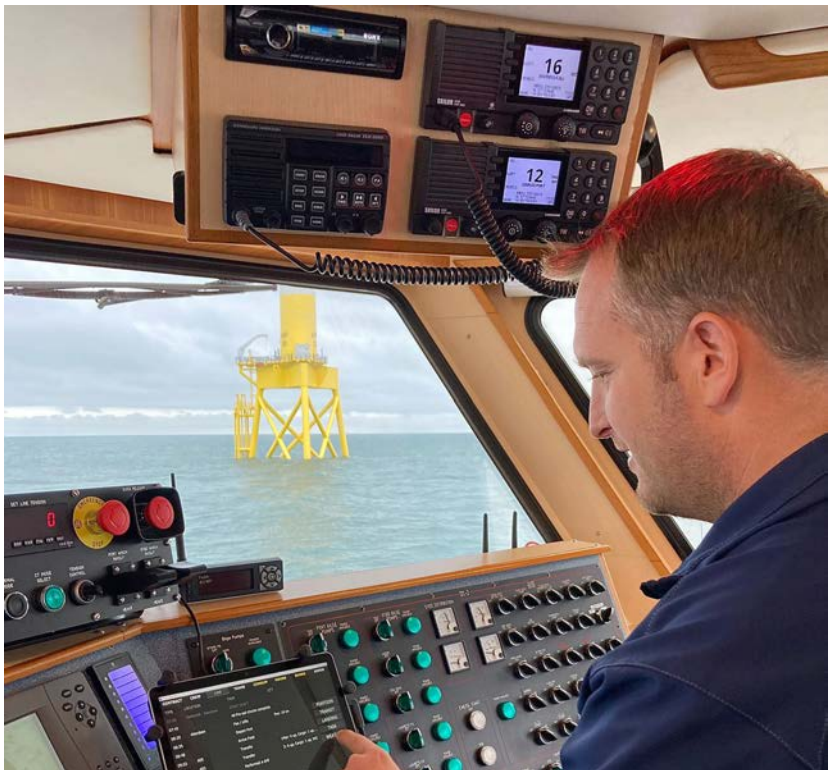
MORE INFO www.dnv.com

MAINTENANCE

Windcat installs Digital DPR on entire boat fleet

Windcat Workboats, a European provider of specialist crew transfer vessels to the offshore wind power industry, has installed Reygar's Digital Daily Reporting System, Digital DPR, across its entire fleet of more than 50 workboats.

The Digital DPR (DDPR) app runs from a touchscreen tablet onboard



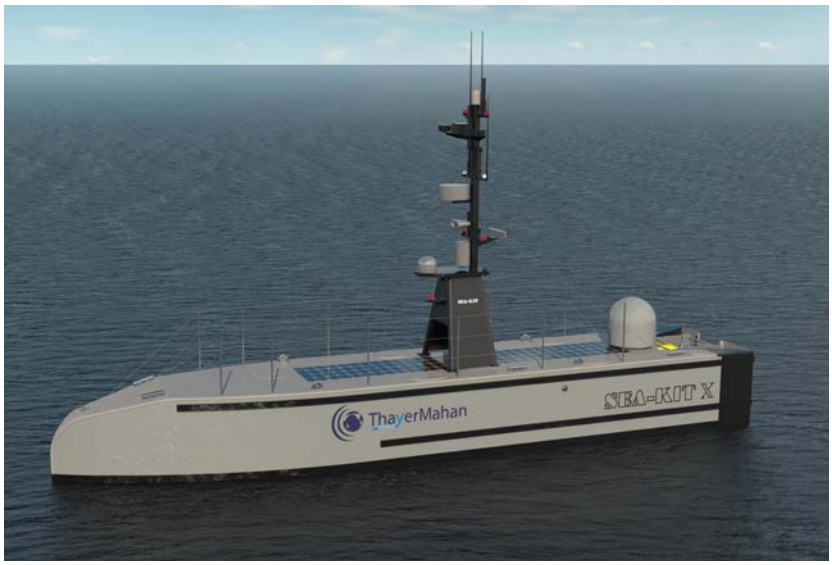
Windcat Workboats' vessels operate in the European offshore wind sector, and also in the oil and gas industry and outside Europe. (Courtesy: Windcat Workboats)

and is easy to use for busy workboat skippers. It reduces the administrative burden of daily progress reporting as well as improving report accuracy and timeliness.

"DDPR saves a lot of time on what is otherwise a long and detailed task," said Aaron Trebilcock, Windcat Workboats master. "The daily progress report is automatically generated and sent out at the end of the shift in a format that is simple to digest."

Reygar's time-saving reporting technology has gone through comprehensive trials on several Windcat Workboats CTVs over the past 18 months. Feedback from skippers and management was positive and fleet wide rollout was completed in mid-October.

"We are committed to meeting the reporting needs of our customers



SEA-KIT International has secured its first export deal with an order from ThayerMahan. (Courtesy: SEA-KIT)

with a digitalized vessel fleet," said Phillip Goffin, Windcat IT manager. "We also want to look after our crews and back-office teams by reducing the reporting burden and streamlining where possible.".

DDPR either works alongside Reygar's award-winning BareFLEET vessel monitoring system, where installed, or runs as a standalone solution. The app can be customized to gather DPR data including crew details, fuel and consumables use, various task types, transits, passenger transfers to turbines and working hours data. Data input live from the vessel can be seen instantly in the cloud by shore staff, with users also able to access cloud based KPI data.

"By providing our customers with a standalone version of this reporting solution, we can make the benefits of digitized reporting available to all fleet operators, whether they use our BareFLEET monitoring system or not," said Chris Huxley-Reynard,

Reygar CEO. "We enjoyed working closely with the team at Windcat to ensure that our DDPR app incorporated the needs of different stakeholders both within and outside their organization."

MORE INFO www.windcatworkboats.com

MAINTENANCE

SEA-KIT secures first USV export deal

SEA-KIT International recently announced its first Uncrewed Surface Vessel (USV) export sale to ThayerMahan, a leader in autonomous maritime solutions based in Connecticut.

"We are always striving to improve the efficiency of maritime domain awareness and to keep people safe," said Mike Connor, ThayerMahan president and CEO. "SEA-KIT's flexible payload design enables us to host multiple, sophisticated maritime sensing systems onboard, which in turn will support ThayerMahan to continue leading the field of remote and autonomous mobile acoustic sensing and sense making."

"We envisage that the introduction of this hi-tech USV to our portfolio will enhance the protection of ports and vessels at sea as well as have a positive impact on illicit trafficking across international borders," Connor said.

ThayerMahan is a provider of remote and autonomous maritime sensing systems for government, industry, and academia. The company plans

Vestas has signed a new agreement with blade supplier TPI Composites. (Courtesy: Vestas)

to use the SEA-KIT USV to support introduction of the technology into government service, as well as for its own commercial activities in U.S. and international waters.

"This U.S. export deal marks a significant milestone in the company's journey so far," said SEA-KIT CEO Ben Simpson. "The U.K. is forging a leadership stance in Maritime Autonomous Systems innovation, and we are proud to be part of that. We look forward to a fruitful, ongoing partnership with ThayerMahan and to supporting their current and future maritime domain awareness goals."

ThayerMahan is set to take delivery of the latest 12-meter SEA-KIT X-Class design in spring 2023, with plans for it to enter operation over the summer.

MORE INFO www.sea-kit.com

MANUFACTURING

Vestas expands blade partnership with TPI Composites

Vestas recently signed a multi-year agreement with long-time partner TPI Composites Inc. (TPI), a supplier of wind-turbine blades and services, to strengthen its scalable global supply chain network for current and future wind turbine blades.

"The continued and expanded partnership highlights how we are increasingly collaborating with partners, and how we continue to evolve and re-shape the industry together," said Tommy Rahbek Nielsen, executive vice president and chief operating officer of Vestas.

"We have been working together with TPI since 2014 and during that time, they have become one of our most trusted and strategic blade partners. With this agreement, we are happy to continue this journey, leveraging their global footprint and providing scalable, high-quality, and sustainable supply together."

TPI and Vestas work together on global manufacturing and supply chain operations, based on Vestas' specifications and requirements, and TPI is supplying a range of blade variants to Vestas' 2- and 4-MW platforms as well as the EnVentus platform.

TPI will continue supply of blades from its existing global production footprint, while optimizing the production setup in current facilities, and evaluate new locations for possible future growth in strategic markets. Vestas and TPI are equally investigating further collaboration possibilities for the V163-4.5 MW and V236-15.0 MW turbines and assessing the optimal manufacturing and production location setup for these new blades.

The new agreement is a continuation of the existing Vestas and TPI partnership agreement, and further builds on the expanding capabilities of TPI and core strengths of both companies.

Sharing manufacturing operations across the renewables industry is more relevant than ever to ensure sites are not sitting idle and creates a flexible, scalable, and efficient supply chain that enables industrial scale to meet global net-zero ambitions.

"We are proud of our long and successful partnership with Vestas and are pleased that Vestas has chosen to further expand its relationship with TPI," said Bill Siwek, CEO, TPI Composites Inc.

"We look forward to continuing our collaboration with the supply of current and future blade models, blade design, and other services globally."

MORE INFO www.vestas.com

MANUFACTURING

Vestas secures 203-MW order for U.S. project

Vestas has received a 203-MW order to power an undisclosed wind project in the U.S. The order consists of 45 V150-4.5 MW wind turbines.

The order includes supply, delivery, and commissioning of the turbines, as well as a multi-year Active Output Management 5000 (AOM 5000) service agreement, designed to ensure optimized performance of the asset.

Turbine delivery begins in the third quarter of 2023 with commissioning scheduled in the fourth quarter of 2023.

MORE INFO www.vestas.com