



Illustration of a floating wind turbine. (Courtesy: Cerulean Winds)

## CONSTRUCTION

### Cerulean Winds names NOV as offshore delivery partner

Green infrastructure developer Cerulean Winds has named NOV as the first of its delivery partners for the fabrication of its proposed integrated 200-turbine floating wind and hydrogen development off the coast of Scotland.

The arrangement would establish NOV as the exclusive provider of floating and mooring systems in support of the venture, which would have the capacity to accelerate the decarbonization of oil and gas assets in the UKCS by more than halving the 18 million metric tons of CO<sub>2</sub> they currently produce by 2025.

NOV, one of the largest providers of marine equipment and wind-vessel designs in the world, has more than 20 years of experience in the offshore wind sector and unrivaled expertise in the installation and maintenance of floating structures in the energy space. Its participation as a delivery partner confirms the viability of Cerulean Winds' trailblazing proposal.

Cerulean Winds is led by Dan Jackson and Mark Dixon, who have more than 25 years' experience working together on large-scale offshore infrastructure developments in the oil and gas industry.

"We are very pleased to announce NOV's involvement with the project," Dixon said. "As the largest and most qualified provider of marine equipment and wind-vessel designs working in this space, the experience and

knowledge they will bring to a project of this magnitude is second to none. Having them on board brings the scheme a step closer to reality. We have a number of Tier 1 delivery stakeholders signed up. We can't disclose who they are at this stage, but they are some of the largest providers in the world, with the scale and capacity to deliver, and we look forward to making further announcements over the coming months."

"We are very excited to partner with Cerulean on this groundbreaking proposal, which will leverage NOV's core competencies as well as our U.K. and European infrastructure and personnel in a key energy transition project, which will drive major progress in the goal of decarbonizing the Offshore U.K. sector," said Joe Rovig, president of NOV Rig Technologies. "NOV is eager to

demonstrate our abilities as one of the key partners and household names in the global energy transition, just as it has been for decades in the traditional oil and gas industry.”

Targets set out in the recently published North Sea Transition Deal call for a reduction in offshore emissions by 10 percent by 2025 and 25 percent by 2027. To achieve that, preparatory work must begin now if those targets are to be met. Failure to do so undermines the objectives of the Deal.

If it gets the go-ahead, the £10 billion Cerulean Winds project has the capacity to generate enough power to electrify the majority of assets in the UKCS to meet and exceed those targets within the timescale.

However, the timing involved in gaining approvals for the project is critical. Cerulean Winds has submitted a formal request to Marine Scotland for seabed leases, and these must be granted by Q3 in 2021 to target financial close in Q1 2022 and to begin construction soon after so that the infrastructure is in place by 2024-2026.

To support this, the venture is calling on the Scottish and U.K. governments to make an “exceptional” case to deliver an “extraordinary” outcome for the economy and the environment.

“The U.K. has set world leading targets to progress energy transition, but to achieve them there must be a greater sense of urgency and joined up thinking,” Jackson said. “If assets don’t reduce their CO2 emissions by the mid-2020s, increased emissions penalties through carbon taxes will see many North Sea fields become uneconomical and move them toward decommissioning by the end of the decade at the cost of thousands of jobs. That would seriously compromise the U.K. oil and gas industry’s role in homegrown energy security. It must remain a vital element in the transition journey for decades to come, but emissions have to be cut significantly to make the production greener.”

“This project will accelerate that process enabling assets to not only

cut their emissions in line with targets but to greatly exceed them,” he said. “There are no other proposals currently in the pipeline with the scale and capacity to deliver that result, but to achieve it, the process must begin now, which is why a favorable decision on seabed leases by Q3 2021 is essential.”

The proposed development involves:

- ▼ More than 200 of the largest floating turbines at sites West of Shetland and in the Central North Sea with 3GWh of capacity, feeding power to the offshore facilities and excess 1.5 GWh power to onshore green hydrogen plants.

- ▼ Ability to electrify the majority of current UKCS assets as well as future production potential from 2024 to reduce emissions well ahead of abatement targets.

- ▼ 100 percent availability of green power to offshore platforms at a price below current gas turbine generation through a self-sustained scheme with no upfront cost to operators.

- ▼ The development of green hydrogen at scale and £1 billion hydrogen export potential.

- ▼ No subsidies or CFD requirements and the generation of hundreds of millions of pounds in government revenue via leases and taxation through to 2030 and beyond.

Cerulean has undertaken the necessary infrastructure planning for the

scheme to ensure the required level of project readiness, targeting financial close in Q1 2022. The company is being advised by Société Générale, one of the leading European financial services groups, and Piper Sandler, corporate finance advisors to the energy industry.

**MORE INFO** [ceruleanwinds.com](http://ceruleanwinds.com)

## ► CONSTRUCTION

### Collett & Sons to transport components for Scotland wind farm

Collett & Sons, specialists in heavy hauling, will transport and manage all wind-turbine components for the Windy Rig wind farm in Dumfries & Galloway, Scotland.

Heavy haulage specialists Collett are the first transport company to use a Blade Lifter on a U.K. wind farm. Working in partnership with P. Adams Transport, Collett have been appointed to manage and transport all wind turbine components for Windy Rig wind farm in Dumfries & Galloway, Scotland.

The Windy Rig wind farm will consist of 12 Vestas V112 turbines when finished. Each turbine features 55-meter long blades and a 69-meter hub height.



Collett is the first transport company to use a Blade Lifter on a U.K. wind farm. (Courtesy: Collett & Sons)



An Enerpac cylinder compresses the top and bottom wheels together. (Courtesy: DLM)

Collett will use its Super Wing Carriers to transport the 55-meter-long blades during night deliveries from the Port of Ayr to a transition point located 18 kilometers from the main wind farm site. The blades are then transferred onto the Blade Lifter operated by P. Adams for the final part of the trip.

The company's fleet of specialized trailers will deliver the rest of the components; including tower clamp trailers for the tower sections and multi-axle low-bed trailers for the heavier components such as the nacelle and drive trains.

The Blade Lifter mounts the blade

horizontally on to the module. Using the Blade Lifter's hydraulic lifting system, the blade can be tilted to an angle of up to 60 degrees, avoiding the need for extensive and expensive civil engineering.

Collett & Sons will be the first company to use a Blade Lifter on a U.K. wind farm. Using the Blade Lifter has enabled planning consent for the Windy Rig farm without the risks and costs associated with third party land.

All equipment deliveries are under way and are expected to be completed later in 2021.

**MORE INFO** [www.collett.co.uk](http://www.collett.co.uk)

## ▀ CONSTRUCTION

### DLM's saddleback holdback tensioner used for subsea cable

Dynamic Load Monitoring Ltd. of Southampton, U.K., has expanded its range of line tension measurement technology with a new device for measuring tension and creating holdback force on a single piece of subsea cable. The product, which combines the established Saddleback product from DLM's catalog with an additional hold

back tension element, is being primarily used by the vessel NKT Victoria, with further devices in the pipeline for a number of customers.

When consulted about a solution for measuring line tension and creating a holdback force for a cable lay project, DLM, a specialist in the design, manufacture, repair, and calibration of load cells and load monitoring equipment, devised the saddleback holdback tensioner (SB-HBT).

The SB-HBT (450 kilograms) works by creating additional line tension on the subsea cable running through it, specifically for bundled cable lays. A saddleback can measure line tension from zero to 5,000 kilograms and is suited for more delicate cable, including telecommunication cables or large cable where a running line monitor is unsuitable. Moreover, a twin pair of Dunlop 18 x 7 SMO LCE tyres are connected to a hydraulic cylinder to clamp the two wheels together, and a disc-braking system is used to con-

trol the rotational speed of the wheels on the SB-HBT. The device can create 750 kilograms of clamping force between the wheels and holdback 500 kilograms of line tension. On the top wheel there is an encoder to measure speed and distance.

“This is the first requirement we have had (for the SB-HBT), but we have discussed it with other potential customers; this seems to be a reoccurring problem aboard vessels,” said Chris Scrutton, technical manager at DLM. “It can be used when a cable-laying vessel is completing a new lay project and needs to control the departure speed to small diameter cables being bundled alongside larger cable diameters. The reason for doing this is that the small diameter cable often does not bundle tightly enough with the larger diameter cables and can run free of the bundle when departing off of the vessel.”

In this instance, NKT, a provider of turnkey cable solutions that meet the

ever-growing demand for power, is using the SB-HBT on a 22-millimeter-diameter fiber optic cable. The “holdback” (holdback force is essentially a term for adding line tension to a cable) element of the device creates additional tension to control the departure speed of the cable for bundling with DC power cable prior to being laid subsea.

An Enerpac cylinder compresses the top and bottom wheel together to create grip pressure onto the cable before the brakes are employed to slowly rotate the wheels. Without clamping the two wheels together, the cable would simply run free.

The (orange) HBT element houses all of the components, while the saddleback is the item bolted to the front of the frame.

“This was another project where we were approached by a client with a design brief to develop a product for their application,” Scrutton said. “NKT had a specific requirement for a device that could measure the line

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tension and create the holdback force. The concept went from a design discussion to a delivered product in less than six months.”

**MORE INFO** [www.dlm-uk.com](http://www.dlm-uk.com)

## INNOVATION

### UAT announces vertical-helix wind-turbine testing

Umbra Applied Technologies Group, Inc., a subsidiary of Umbra Applied Technologies, recently announced that its proprietary, advanced wind turbine soon will begin undergoing field testing.

Dubbed the V-HET, the high-tech vertical helix turbine is constructed of aluminum, carbon fiber, additional composite materials, and steel, making each unit robust enough to withstand the elements but light enough to harness the maximum amount of wind power. The technology uses a modified helix-shaped, wind-capturing design that increases the unit’s ability to harness more of the wind’s energy. The helix blades use an electromagnetic field to “float” the blades to reduce mechanical resistance and the loss of energy associated with the friction that plagues many modern systems in use. This enables the unit to generate power at extremely low wind speeds typically only common of much smaller units, while producing exponentially more energy.

Testing will also include the V-HET variant, V-HETp. The V-HETp or vertical helix turbine power station, harnesses energy from wind, solar, ambient temperature differentiation, and in-ground telluric currents. This is a significant leap forward in producing true clean energy using more than 75 percent recycled materials to manufacture each unit. The company estimates the carbon cost of delivering each unit to be a fraction of existing platforms.

An array of 12 units is estimated to



The V-HET, the high-tech vertical helix turbine is constructed of aluminum, carbon fiber, additional composite materials, and steel, making each unit robust enough to withstand the elements but light enough to harness the maximum amount of wind power. (Courtesy: UAT)

produce as much as 85,500 kWh of energy annually — about what seven average American homes burn in a year. A building’s electrical system will take the energy when it is available and switch to power from the local utility when it is not. The V-Het will cost a fraction of what many wind turbines currently in use do and are targeted to deliver more electricity than units similar in size.

“Units have been under development for several years and represent a paradigm shift in current wind-harnessing technology,” said UAT’s CEO, Alex Umbra. “I am optimistic that once delivered, this platform will represent a significant leap forward in the clean-energy segment.”

The company estimates this technology can cut the carbon emissions of a 10-story commercial building by about 2 million pounds annually and saving the equivalent of 44,000 gallons of gasoline each year.

The units will be tested in varying environments across the United States in a partnership that includes business owners that have been long-time shareholders. These shareholders have volunteered to assist in the testing and development process onsite, at their places of business, to include several automotive dealerships.

“From the moment we launched Hygiea-related products, we have in-

cluded shareholders in the testing and development process in a shareholder-centric partnership,” Umbra said. “This partnership affords the company an opportunity to include our shareholders in a way that most companies do not. Who better to get feedback from than those that have a vested interest in the company’s success? With Helix (V-HET), the goal is to test the unit’s ability to not only capture energy but determine its ability to deliver that energy for the purposes of charging EVs. This will assist in further reducing the carbon footprint of such vehicles and deliver true clean energy to charge them.”

**MORE INFO** [umbraappliedtechnologies.com](http://umbraappliedtechnologies.com)

## INNOVATION

### AerosUSA offers cable protection system for offshore equipment

AerosUSA is offering High-Performance Cable Protection Systems to increase the ability of offshore wind equipment.

As wind farms increasingly move offshore, environmental factors will play a larger role. For example, turbine towers will be exposed to a greater



AerosUSA is the North American distributor of DetasUltra cable entry systems. (Courtesy: AerosUSA)

and more constant amount of wind. Increased motion will then cause more torsion, vibration, and abrasion to the cabling and wiring, which leads to higher possibilities of rework and retrofiting.

The system includes conduits, fittings, and accessories that meet various industries' regulations. Its core products are manufactured from high-performance polyamide resins and include FLEXAquick, one-piece fitting technology from AerosUSA.

The lighter weight solution includes UV protection and several levels of IP ratings. AerosUSA has, for more than 10 years, supported onshore sites, so its cable protection product portfolio is uniquely suited for offshore needs.

**MORE INFO** [aerosusa.com](http://aerosusa.com)

## INNOVATION

### Kenzen makes heat stress trackable with additions to smart PPE

Kenzen has improved its smart PPE system to keep workers safer in hot environments. The additions can now track heat susceptibility and sweat rate, both of which are important to managing stress, injury, and fatality risk.

The system calculates a worker's susceptibility to heat, classifying that into low, moderate, or high risk categories. The calculations are determined by workers' physical fitness, medical conditions, history of heat injury or illness, chronic illnesses, medications, and age.

The system does not track personal information, and is only used to help supervisors manage and monitor heat risk.

"Managers have so much to worry about at their worksite, including if their workers are physically able to work safely to get the job done well and on time," said Nicole Moyon, Kenzen's vice president of research and development. "This new feature tells managers which workers to monitor closely on hot days, and when and how to alter an individual's schedule or workload."

Kenzen's sweat rate monitoring feature uses a worker's information and physiological data to calculate and predict their sweat rate in liters per hour. A manager can view an individual's sweat rate on the Kenzen analytics dashboard, which also indicates



Poseidon Systems is deploying its DM4500 to a total of 402 turbines. (Courtesy: Poseidon Systems)

how much water that person needs to drink each hour to stay hydrated. The data eliminates the guesswork in how to keep workers safely. Using the system, managers can bring enough water to the worksite to hydrate their teams sufficiently, based on each individual's sweat rate and the predicted environmental conditions that day. Kenzen's proprietary sweat rate feature gives a hydration plan that is accurate within one quarter of a liter (1 cup of water).

"There is no 'one size fits all' when it comes to hydration, which is why it's important to use each person's sweat rate for an individualized hydration plan," Moyen said. "Dehydration is a major problem on worksites and increases the chances of someone getting a heat injury or illness, having an accident at the worksite, or suffering from cognitive impairment. Staying hydrated is a simple fix to avoid most of these problems."

Kenzen devices worn by workers contain sensors that monitor, in real time, an individual's physiological responses. The system warns workers when their core temperature is too high and they are in danger of a heat-related injury. Managers have a corresponding app that alerts them when a worker needs an intervention to stop work, rest, and hydrate, and a second alert for when it's safe to return to work. The system can also

aggregate data over weeks and months.

Kenzen's heat monitors are used by workforces across the globe in domains such as construction, mining, field services, manufacturing, renewable energy, utility oil and gas, agriculture, and transportation.

This summer, Kenzen has a rental program for companies to quickly deploy the technology with packages of 10, 20, and 50 devices.

**MORE INFO** [Kenzen.com](http://Kenzen.com)

## INNOVATION

### Poseidon deploys wear debris monitoring system

Poseidon Systems is deploying its wear debris condition monitoring device, the DM4500, across 10 sites in Duke Energy Sustainable Solutions' wind turbine fleet.

The sites include wind turbines from Siemens Gamesa, Suzlon, Nordex, and GE wind turbines, a total of 402 turbines.

"We appreciate Duke Energy Sustainable Solutions' forward thinking and innovation integrating wear debris CMS into their already existing vibration-based CMS monitoring program," said Mark Redding, CEO and

founder of Poseidon Systems.

Poseidon's monitoring is being deployed alongside Duke's existing vibration-based condition monitoring system to provide earlier detection of gearbox faults, better indicators of fault severity and end-of-life, as well as catastrophic event detection.

"The addition of the Poseidon Wear Debris Monitor Device to our toolbox will greatly improve our ability to understand the current condition or status of our gearboxes," said Jeffrey Wehner, Duke Energy Sustainable Solutions' Vice President of Operations. "This device, coupled with vibration and lubrication analyses, will allow the team to provide more specific recommendations to extend gearbox life. Being able to predict future gearbox events and plan repairs or replacements prior to catastrophic failure will result in cost savings to the business unit."

Poseidon Systems projects that it will have 10,000 wind-turbine condition monitoring kits installed by end of 2021.

Using data from the Poseidon Systems' installed base, Poseidon will continue to work with Duke Energy Sustainable Solutions and other wind customers to develop more advanced detection alarms and life extension algorithms. This development has extended to recent integration of journal bearings on wind-turbine gearboxes,

using the DM4500's superior detection range of non-ferrous materials for better detection of emerging faults.

Through Poseidon Live (PSL), cloud-based online monitoring software, Poseidon Systems is helping customers detect asset failures at the earliest possible point in time and prevent failures through identification of root causes before failure occurs.

**MORE INFO** [poseidonsys.com](http://poseidonsys.com).

▀ **MAINTENANCE**

## Deutsche WindGuard gains body type A inspection status

Deutsche WindGuard has repositioned its wind energy turbine service area, which will now operate independently as Deutsche WindGuard Inspection GmbH.



The German Accreditation Body “This new classification as a type For 20 years, Deutsche Windguard has inspected offshore and onshore wind turbines. (Courtesy: Deutsche WindGuard)

DAkKS awarded Deutsche WindGuard in early June.

The company was accredited back in 2010, and since then it has constantly expanded its range of services. Today, the company inspects about 800 turbines on sea and land in each year.

A inspection body is the logical consequence of our many years of experience and service quality,” said Jan Wallasch, managing director of Deutsche WindGuard Inspection. “This accreditation, in accordance with an internationally valid standard, certi-

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fies us and guarantees our customers maximum independence and highest quality standards,” Wallasch said.

The certification comprises inspection of wind turbines and their components, including commissioning inspections, recurring inspections, lifetime extension inspections, endoscopic inspections of gearboxes, bearings and generators, and hoist platform inspections.

“For all these tasks, we are optimally positioned with our almost 20 qualified experts,” Wallasch said. “Most of them have been contributing their expertise to the success of our inspection body for many years.”

**MORE INFO** [www.windguard.com](http://www.windguard.com)

## MAINTENANCE

### R&D develops Bolt-Check tension measurement tool

R&D, an engineering company headquartered in Denmark that supplies test systems and consultancy for the wind-energy sector, has developed the Bolt-Check system, a bolt-tension measuring tool.

Designed to be used on standard bolts, Bolt-Check offers wind turbine manufacturers and service companies a series of benefits normally only available at much higher prices.

Wind turbines typically contain more than 6,000 bolts, and every bolted joint requires regular in-service tension inspections, because force and vibrations can loosen bolts over time. These inspections are time-consuming and expensive, and results can vary based on the inspection method.

“This Bolt-Check system can be implemented at a cost of 3-4 euros per bolt, which represents a cost advantage for wind-turbine manufacturers since alternative systems using specialized bolts can increase the cost 10 to 50 times per bolt, or even more, depending on the bolt size,” said Flem-

ing Selmer Nielsen, R&D’s senior specialist.

The Bolt-Check system uses its proprietary method based on combining an ultrasonic length measurement with a mechanical measurement, which eliminates the requirement for thousands of bolts to be loosened and then tensioned again to measure the loading on the joints.

Hundreds of bolts can be checked in just a few hours.

“We are offering a solution that gives a high level of accuracy at a very competitive price and even more importantly, it saves a huge amount of time,” Selmer said. “Traditional tools are heavy and potentially dangerous as they operate at high hydraulic pressure,” he said. “Bolt-Check is easy to use and hand-held, therefore, it also provides a significant health, safety, and environment improvement.”

R&D offers Bolt-Check solutions for both new bolts and for bolts already in operation, and includes unique ID tags that are easily added to the bolts either at the installation stage or first inspection check. Tagging the bolt guarantees traceability and detailed documentation.

The system has obtained DNV-GL certification, allowing the Bolt-Check solution to be used for service and maintenance inspections as an alternative to torque or tension tools. The certificate provides independent verification that Bolt-Check fulfills the stringent standards of wind turbine tools and services.

Bolt-Check is scheduled to be presented at the Husum Wind exhibition Sept. 14-17, 2021.

**MORE INFO** [www.rd-as.com/bolt-check](http://www.rd-as.com/bolt-check)

## MANUFACTURING

### Vestas wins 92-MW order in the U.S.

Vestas has received a 92 MW order to power an undisclosed wind project



The Vestas V150-4.2 MW turbine. (Courtesy: Vestas)

in the U.S. The project consists of 22 V150-4.2 MW turbines.

The order includes supply, transport, 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 will begin in the second quarter of 2022 with commissioning scheduled for the fourth quarter of 2022. The customer and project are undisclosed.

Vestas is the energy industry’s global partner on sustainable energy solutions.

The company designs, manufactures, installs, and services onshore and offshore wind turbines across the globe, and with more than 136 GW of wind turbines in 84 countries, it has installed more wind power than anyone else.

Through its industry-leading smart data capabilities and unparalleled more than 117 GW of wind turbines under service, Vestas uses data to interpret, forecast, and exploit wind resources and deliver best-in-class wind-power solutions.

Together with its customers, Vestas’ more than 29,000 employees are bringing the world sustainable energy solutions to power a bright future. ↴

**MORE INFO** [www.vestas.com](http://www.vestas.com)