

Giving Wind Direction

WIND SYSTEMS

IN FOCUS

Safety ▾ Wires & Cables

SAFE CONTINUED OPERATION OF WIND TURBINES

PROFILE

Patriot Industrial Solutions

JULY 2021

windssystemsmag.com



info@torkworx.com

888.502.WORX

torkworx.com

ONSITE BOLTING SERVICES DONE RIGHT.
CALL US TO ACCELERATE THE BIG 6.....
unless you're into wasting money.



WIND ENERGY SOLUTIONS

- ACCELERATED TORQUE AND TENSION SERVICES
- TURNKEY BOLTING SERVICES
- COMPLETE OEM TORQUE AND TENSION SYSTEMS
- BOLTING CONSULTATION SERVICES
- ISO 17025 ACCREDITED CALIBRATION SERVICES
- REPAIR SERVICES FOR MOST TOOL MODELS
- ERAD DIGITAL TORQUE CONTROL SYSTEMS
- ELECTRIC GEAR TURNING SYSTEMS
- WTG SPECIFIC BOLT TENSIONING SYSTEMS
- HYDRAULIC WRENCH SYSTEMS
- WTG SPECIFIC SELF LOAD INDICATING FASTENERS

extreme bolt working solutions

sales
rental
service
consulting
engineering

GATHER WITH CONFIDENCE

Following all COVID-19 guidelines and working closely with the city of St. Louis, AGMA is "All In" to ensuring a safe and comfortable place to do business.



MOTION+POWER
TECHNOLOGY EXPO

GEAR ELECTRIC FLUID POWER



MOVING THE FUTURE.

SEPTEMBER 14–16, 2021

AMERICA'S CENTER CONVENTION COMPLEX
ST. LOUIS, MO

MPT Expo is the first in-person opportunity for the entire power transmission supply chain to gather safely, witness the latest innovation, and do business face-to-face. Attend workshops and seminars to learn what's driving the next generation of solutions, and then get hands-on experience with the equipment just steps away on the Expo floor.

REGISTER EARLY AND SAVE!
Visit MotionPowerExpo.com

Formerly Gear Expo Owned by



American
Gear Manufacturers
Association

14

IN FOCUS

SAFE, CONTINUED TURBINE OPERATION

After 20 years, most wind-energy converters (WEC) reach the end of their design life.

TURBINES AND FIRE RISK

As more turbines are being built, dealing with the possibility of a fire should be an important step for the owner-operator. 20

TECHNOLOGY, INFRASTRUCTURE KEY TO U.S. OFFSHORE SUCCESS

Offshore wind is vital to President Biden's pledge to reduce carbon emissions in the U.S. 24

PROFILE

Patriot Industrial Solutions offers bolting equipment and climb-assist and emergency-descent equipment, as well as custom-engineered solutions for the wind-energy industry. 28



CONVERSATION

Tim Boettcher, president and founder of Amazing Magnets, discusses how magnets are used in wind energy 32

HEAT TREAT

31ST HEAT TREATING SOCIETY
CONFERENCE & EXPOSITION

21

September 14-16, 2021 | St. Louis, Missouri

HEAT TREAT 2021 IS THE EVENT THAT BRIDGES RESEARCH WITH INDUSTRY!

Heat Treat is the premier conference and expo for heat treating professionals, attracting global innovators, researchers, influencers, and decision makers from around the world. Next year's conference and expo will feature:

- Three days of face-to-face networking opportunities with approximately 200 heat treat exhibitors and companies. All of the top companies and big names in the heat treating industry will be represented!
- Latest research and industry insights will be offered during more than 125 technical presentations
- "Basics of Heat Treating" education courses
- VIP guided industry tour
- Initiatives for students and emerging professionals
- Continued co-location with AGMA's Motion + Power Technology Expo 2021
- And much more!

WHAT'S NEW FOR 2021?

Co-location with ASM's Annual Meeting, International Materials, Applications, and Technologies (IMAT) Conference and Exposition, featuring:

- Access to 200 additional materials-related exhibitors in the co-located exhibit hall
- Access to an additional 600 technical presentations and workshops, featuring special crossover keynotes and sessions with Heat Treat
- Joint networking events
- Access to comprehensive programming and events for students and emerging professionals
- Joint Heat Treat / IMAT programming in the Solutions Center on the Show Floor

heattreatevent.org

▾ THE FUTURE OF WIND



BOEM and USACE collaborate to meet offshore wind goals
 ▾ *Biden administration advances Pacific offshore wind* ▾
Decarbonization development would cut emissions



UNEARTHING RARE EARTHS

A recent report from the IEA warned of the increasing need of rare-earth materials needed for the production of wind turbines and other renewable-energy innovations.

TAILWINDS

THE BUSINESS OF WIND



▾ CONSTRUCTION

James Fisher to identify UXO on RTE's grid connection **34**



▾ INNOVATION

US Wind deploys floating Lidar buoy in Maryland lease area **36**

▾ MAINTENANCE

Snap-on's cabinets place most-often-used tools in clear view **39**

▾ MANUFACTURING

Crosby's lifting clamps can provide safer wind operations **41**



Canadian Renewable Energy Association
 WIND, SOLAR, STORAGE

Association canadienne de l'énergie renouvelable
 ÉOLIEN, SOLAIRE, STOCKAGE



Wind Systems (ISSN 2327-2422) is published monthly by Media Solutions, Inc., 2660 Yeager Parkway Pelham, AL 35124. Phone (205) 380-1573 Fax (205) 380-1580 International subscription rates: \$72.00 per year. Periodicals Postage Paid at Pelham, AL and at additional mailing offices. Printed in the USA. POSTMASTER: Send address changes to Wind Systems magazine, P.O. Box 1210 Pelham AL 35124. Publications mail agreement No. 41395015 return undeliverable Canadian addresses to P.O. Box 503 RPO West Beaver Creek Richmond Hill, ON L4B4R6. Copyright 2006 by Media Solutions, Inc. All rights reserved.

BRIGHT IDEA

Wind Systems magazine is the place to plug in to information about the wind-energy industry.

You'll find topical articles, company profiles, and interviews with industry insiders, and timely wind energy news.

Giving Wind Direction

WIND SYSTEMS

Get your FREE subscription, plus our online content, at www.windsystemsmag.com



Introducing our new Media Portal

I know 2021 started out feeling little like 2020, Part 2, but, so far, I think the year has managed to serve up a few surprises — the good kind. But you know what they say: An optimist sees the glass half full; a pessimist sees the glass half empty, and a physicist sees the glass as completely full no matter what his mood is. (I'll give you a minute to process that one.)

While you ponder, I want to share some news about an exciting new feature that we recently launched on our website: *Wind Systems'* Media Portal.



When you enter the Media Portal through our nav bar, you'll discover what we think of as a "one-stop shopping" tool for wind-energy companies looking for the newest and latest information social media has to offer.

At the top of the new page, you'll have the opportunity to gain access to posts from Facebook, Twitter, and YouTube from a wide range of wind companies across the U.S. and around the world. Scroll to find a company you're interested in, and click the name. If they have posts on social media, you'll find them immediately. No need to search endlessly across the

various platforms. We make sure it's all there for you.

We feel that's pretty cool, but that's not all our Media Portal can do for you. If you're looking for webinars, blogs, and podcasts, we give you access to those as well. And this service is for the companies responsible for webinars, blogs, and podcasts as much as it is for our readers in search of them. If you have a webinar, blog, or podcast, send us a link, and we will make sure readers can access it through our Media Portal.

Check it out, and let me know what you think. If you have suggestions to make it even more user-friendly, send them my way. After all, *Wind Systems'* ultimate goal is to make sure those involved with wind energy get the best information about the industry that's available.

And, as long as I have you here, check out some of the cool features available in this issue of *Wind Systems*. We're focusing on safety and cables.

And make sure you check out Crosswinds, where I share with you the importance of developing and maintaining sources for rare-earth minerals necessary for component construction.

I hope you enjoy this issue, and I hope you get to spend some time with our new Media Portal. We're pretty proud of it, and we think you'll find it very useful going forward.

As always, thanks for reading!



Kenneth Carter, editor

Wind Systems magazine
editor@windsystemsmag.com
(800) 366-2185, ext. 204

David C. Cooper
Publisher

EDITORIAL

Kenneth Carter
Editor

Jennifer Jacobson
Associate Editor

Joe Crowe
Contributing Editor

SALES

David Gomez
National Sales Manager

Ben Keaten
Regional Sales Manager

CIRCULATION

Teresa Cooper
Manager

Jamie Willett
Assistant

DESIGN

Rick Frennea
Creative Director

Michele Hall
Graphic Designer

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage-and-retrieval system without permission in writing from the publisher. The views expressed by those not on the staff of Wind Systems magazine, or who are not specifically employed by Media Solutions, Inc., are purely their own. All "News" material has either been submitted by the subject company or pulled directly from their corporate web site, which is assumed to be cleared for release. Comments and submissions are welcome, and can be submitted to editor@windsystemsmag.com.



Published by Media Solutions, Inc.
P.O. Box 1987 • Pelham, AL 35124
(800) 366-2185 • (205) 380-1580 fax
info@msimktg.com

David C. Cooper
President

Teresa Cooper
Operations Director

New process promising for blade recycling

From American Clean Power

The problem of what to do with wind-turbine blades at the end of their useful life has grabbed plenty of headlines over the past year. Although the hand-wringing may not match reality (for example 10 times as many plastic plates and cups end up in U.S. landfills compared to turbine blades), industry and research institutions have forged ahead to find innovative technology solutions for the limited impacts blades do have on the U.S. waste stream. Potential avenues include repurposing blades as utility towers or breaking them down into pellets that can be used as building materials.

Now, turbine manufacturer Vestas has partnered with other groups and developed a possible breakthrough. The company – along with Olin, the Danish Technological Institute (DTI), and Aarhus University – has created an initiative called CETEC (Circular Economy for Thermosets Epoxy Composites). Using a two-step chemical process, CETEC provides a way to break down blades into their virgin components, which can then be used to make brand new blades, forming a circular manufacturing process and eliminating the need for blades to be landfilled.

“As global commitments to a net-zero future increase, it’s absolutely crucial to ensure the wind industry can scale sustainably, which includes Vestas fulfilling our ambition to produce zero-waste turbines by 2040,” said Allan Korsgaard Poulsen, head of Sustainability and Advanced Materials, Vestas Innovation and Concepts. “Leveraging this new technological breakthrough in chemcycling epoxy resin, the CETEC project will be a significant milestone in Vestas’ journey toward achieving this goal and in enabling a future where landfill is no longer required in blade decommissioning.”

Wind turbines are already 85- to 90-percent recyclable, and the blades pose the final gap. The challenge of how to handle blades remains a technological question rather than an environmental one – blades constitute an infinitesimal portion of our solid waste stream, and they are inert materials that don’t break down in harmful ways when they do end up in a landfill.



American Clean Power is the voice of companies from across the clean-power sector that are powering America’s future. For more information, go to www.cleanpower.org



IRONCLAD SUPER DUTY BOLT CAPS

- Polypropylene construction – resists shattering or cracking
- Made in the USA – minimal supply chain disruption
- Universal fit
- Ships on your schedule
- Integrated O-ring
- Vented – prevents vacuum



- 16" Long – fits most bolt projections
- Reusable – easy install, remove and reinstall

800.359.0372 JWBRUCE@NTCWIND.COM NTCWIND.COM



Pamco Machine Works, Inc.



Mechanical Repair Experts!



Rebuild your Gear-boxes, Main Shafts Assemblies, Yaw Drives, Fabricate Replacement Parts

www.pamcomachine.com



DIRECTION

THE FUTURE OF WIND

The image shows two large, white, three-bladed offshore wind turbines standing in the ocean. The turbines have yellow bases. The sky is a clear, bright blue, and the water is a deep blue with some whitecaps. The turbines are positioned in the middle ground, with one slightly closer to the viewer than the other.

The agreement will allow USACE to provide BOEM additional scientific and technical resources needed to evaluate offshore wind projects on the OCS. (Courtesy: BOEM)

BOEM and USACE collaborate to meet offshore wind goals

In order to increase renewable energy production in offshore waters and help the administration meet its commitment to deploy 30 GW of offshore wind energy by 2030, the Bureau of Ocean Energy Management (BOEM) and the U.S. Army Corps of Engineers (USACE) have entered into an agreement in support of planning and reviewing renewable energy projects on the Outer Continental Shelf (OCS).

The agreement will allow USACE to provide BOEM additional scientific and technical resources needed to evaluate offshore wind projects on the OCS. While the scope of the agreement covers all renewable energy activities in the Atlantic, the initial focus will be on the USACE supporting the review of the Coastal Virginia Offshore Wind Commercial project and the Kitty Hawk project, offshore North Carolina.

The partnership between BOEM and USACE is a result of President Joe Biden's executive order 14008, *Tackling the Climate Crisis at Home and Abroad*, which directed interagency consultation between the Department of the Interior and Department of Defense (DOD) in order to increase renewable energy production on public lands and in offshore waters, while ensuring robust protection for U.S. lands, waters, and biodiversity and creating good-paying jobs.

"This agreement shows the value of a whole-of-government approach to clean-energy development," said BOEM Director Amanda Lefton. "BOEM has a long history of successful collaboration with the DOD and USACE on energy and marine mineral projects. Additionally, our state partnerships are vital to the advancement of BOEM's renewable energy program."

"This partnership is a great example of federal agencies coming together for a common goal: to advance renewable energy solutions for the nation," said USACE North Atlantic Division Programs Director Karen Baker. "We look forward to applying USACE scien-

tific and technical support to enable the BOEM-led team."

The agreement gives BOEM access to USACE technical expertise while planning new leasing in the Atlantic and reviewing National Environmental Policy Act documents, construction and operations plans (project proposals), facility design reports, and fabrication and installation reports.

"The Commonwealth of Virginia and Old Dominion University were pleased to work with BOEM and the U.S. Army Corps of Engineers to develop this expanded review process," said Virginia Gov. Ralph Northam. "We hope that it will provide a clear line of sight for offshore wind development and signals to the world that Virginia and the United States are leaders in offshore wind."

"I applaud the Biden-Harris administration's commitment to advancing clean energy jobs and tackling climate change through additional support for offshore wind development," said North Carolina Gov. Roy Cooper. "North Carolina is a national leader in clean energy and manufacturing, and partnerships like this one support both our environment and economy."

The demand for renewable energy has never been greater. Recent technological advances have enhanced the cost effectiveness of renewable energy projects, and now their tremendous economic potential provides a promising path that will diversify our national energy portfolio, while at the same time combat climate change, create good-paying jobs, and encourage investment in communities.

MORE INFO www.boem.gov

Biden administration advances Pacific offshore wind

Secretary of the Interior Deb Haaland,

National Climate Adviser Gina McCarthy, Under Secretary of Defense for Policy Dr. Colin Kahl, and California Gov. Gavin Newsom recently announced an agreement to advance areas for offshore wind off the northern and central coasts of California. This significant milestone is part of the Biden-Harris administration's goal to create thousands of jobs through the deployment of 30 GW of offshore wind by 2030.

These initial areas for offshore wind development could bring up to 4.6 GW of clean energy to the grid, enough to power 1.6 million homes.

The Department of the Interior, in cooperation with the Department of Defense and the State of California, has identified an area ("the Morro Bay 399 Area") that will support 3 GW of offshore wind on roughly 399 square miles off California's central coast region, northwest of Morro Bay. The Department of the Interior is also advancing the Humboldt Call Area as a potential Wind Energy Area (WEA) off northern California. These identified areas will enable the build out of a significant new domestic clean-energy resource over the next decade or more.

"I believe that a clean-energy future is within our grasp in the United States, but it will take all of us and the best-available science to make it happen. (This) announcement reflects months of active engagement and dedication between partners who are committed to advancing a clean energy future," Haaland said. "The offshore wind industry has the potential to create tens of thousands of good-paying union jobs across the nation, while combating the negative effects of climate change. Interior is proud to be part of an all-of-government approach toward the Biden-Harris administration's ambitious renewable energy goals."

The announcement comes after years of collaboration between the departments of the Interior and Defense



Pacific offshore wind development could bring up to 4.6 GW of clean energy to the grid, enough to power 1.6 million homes. (Courtesy: U.S. Department of the Interior)

to find areas off the central coast of California that are compatible with the Department of Defense's training and testing operations. The Bureau of Ocean Energy Management (BOEM) issued a Call for Information and Nominations for offshore wind on October 19, 2018, for three areas off the central and northern coasts, including Humboldt and Morro Bay.

The Department of Defense engages in significant testing, training, and operations off the coast of California that are essential to national security. The Department of the Interior acknowledges the critical nature of current and future military testing, training, and operations and acknowledges that ensuring the operational integrity thereof is a national security imperative. Interior's Bureau of Ocean Energy Management will work with the Department of Defense to ensure long-term protection of military testing, training, and operations, while pursuing new domestic clean energy resources.

"Tackling the climate crisis is a national security imperative, and the Defense Department is proud to have played a role in this important effort," Kahl said. "The Defense Department is committed to working across the U.S. government to find solutions that support renewable energy in a manner

compatible with essential military operations. Throughout this effort, the Defense Department has worked tirelessly with the White House, the Department of the Interior, and the State of California to find solutions that enable offshore wind development, while ensuring long-term protection for testing, training, and operations critical to our military readiness. The Defense Department applauds this step and looks forward to continued coordination to address the climate crisis."

In addition to contributing to the goals of the Biden-Harris administration, the development of offshore wind can help California reach its goal of carbon free energy by 2045, create good-paying, union jobs, and foster investments in coastal communities. Offshore wind resources are typically stronger and more consistent than land-based wind and is especially strong in the evening hours when solar production drops off, ensuring it can make an important contribution to California's electric grid.

"Developing offshore wind to produce clean, renewable energy could be a game changer to achieving California's clean energy goals and addressing climate change — all while bolstering the economy and creating new jobs," Newsom said. "This historic announcement, which could provide clean power

er for up to 1.6 million homes over the next decade, represents the innovative approach we need for a clean energy economy that protects the coasts, fisheries, marine life, and Tribal and cultural resources we value so much as Californians."

BOEM, in partnership with California, will hold an Intergovernmental Renewable Energy Task Force meeting June 24 to discuss the identified areas off the north and central coasts as potential WEAs. Following the task force meeting, the WEAs can be finalized and will undergo environmental analysis; BOEM will also undertake government-to-government tribal consultation. The processes for the northern and central coasts will then be merged in a proposed sale notice (PSN) for one lease sale auction, targeted for mid-2022.

MORE INFO www.doi.gov/priorities/clean-energy-future

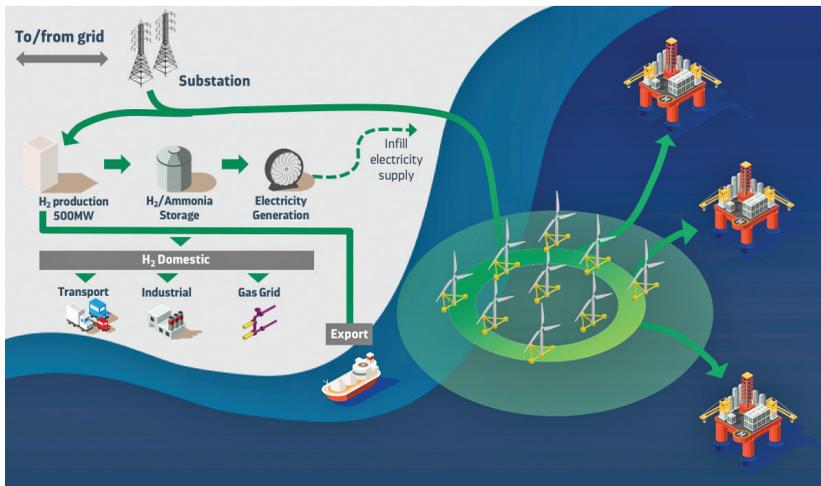
Decarbonization development would cut emissions

Green infrastructure developer Cerulean Winds has revealed an ambitious plan to accelerate decarbonization of oil and gas assets through an integrated 200-turbine floating wind and hydrogen development that would shift the dial on emissions targets and create significant jobs.

The £10 billion proposed green infrastructure plan would have the capacity to abate 20 million metric tons of CO₂ through simultaneous North Sea projects West of Shetland and in the Central North Sea.

The venture is now calling on U.K. and Scottish governments to make an exceptional case to deliver an extraordinary outcome for the economy and the environment. A formal request for seabed leases has been submitted to Marine Scotland.

Cerulean Winds is led by entrepreneurs Dan Jackson and Mark Dixon, who have more than 25 years' experience working together on large-scale



The £10 billion proposed green infrastructure plan would have the capacity to abate 20 million metric tons of CO₂ through simultaneous North Sea projects West of Shetland and in the Central North Sea. (Courtesy: Cerulean Winds)

offshore infrastructure developments in the oil and gas industry. They believe the risk of not moving quickly on basin wide decarbonization would wholly undermine the objectives set out in the recent North Sea Transition Deal.

“The U.K. is progressing the energy transition, but a sense of urgency and joined-up approach is required to enable rapid decarbonization of oil and gas assets or there is a risk of earlier decommissioning and significant job losses,” said Jackson, founding director of Cerulean Winds.

“Emissions are quite rightly no longer acceptable, but with emissions penalties and taxes coming, the U.K. oil and gas industry’s role in home-grown energy security during the transition could be threatened unless current decarbonization efforts can be greatly speeded up. The consequences of not moving quickly enough will be catastrophic for the economy and the environment.”

The Cerulean leadership has Tier 1 contractors in place to deliver the UKCS backbone development and has engaged the financial markets for a fully funded infrastructure construct.

The proposed development involves:

- More than 200 of the largest floating turbines at sites West of Shet-

land and in the Central North Sea with 3 GW per hour of capacity, feeding power to the offshore facilities and excess 1.5 GW per hour 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 hundreds of millions of pounds to government revenue via leases and taxation through to 2030.

Cerulean has undertaken the necessary infrastructure planning for the project to ensure the required level of project readiness, targeting financial close in Q1 2022. Construction would start soon after with energization beginning in 2024. An infrastructure project finance model, commonly used for major capital projects is being adopted.

Société Générale, one of the leading European financial services groups, is advising Cerulean Winds.



DON'T BE LET DOWN BY A LIFT.

Installation and preventative maintenance by IUEC elevator mechanics will keep your elevators moving SAFELY and more EFFICIENTLY.

We have more than 450 elevator companies ready to serve your elevator lift needs.

Contact us today.

CARISA BARRETT
CBARRETT@EIWPFF.ORG
253-561-4902



“The Cerulean UKCS decarbonization project has the potential to meet all of the basin’s transition needs by reducing oil and gas emissions as quickly as possible whilst also introducing large scale green energy,” said Allan Baker, Global Head of Power Advisory and Project Finance. “We are pleased to be supporting the leadership on what is a transformational proposition for the U.K.”

Corporate finance advisers to the

energy industry Piper Sandler are also advising.

“The Piper Sandler investment bankers in the U.K. and in the U.S. have partnered with Cerulean’s leadership over the last year to develop the UKCS decarbonization model, and we are pleased that it is now at the regulatory approval stage,” said Tim Hoover, managing director, Project Finance Investment Banking at Piper Sandler. “It is a scheme that understands the needs

and requirements of the financial markets to make it bankable.”

Cerulean estimates the current 160,000 oil and gas jobs can be safeguarded, and 200,000 new roles within the floating wind and hydrogen sectors will be created within the next five years.

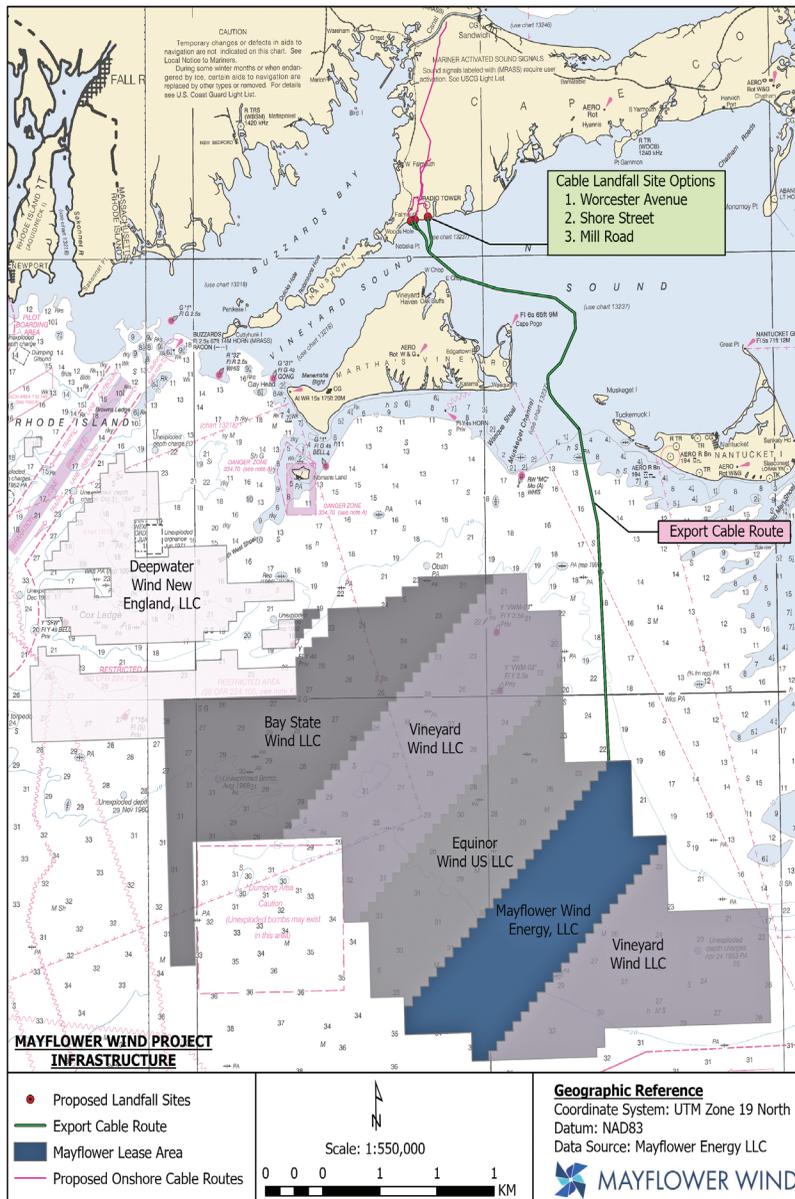
“We have a transformative development that will give the U.K. the opportunity to rapidly decarbonize oil and gas assets, safeguard many thousands of jobs, and support a new green hydrogen supply chain,” Jackson said. “The decision to proceed with the scheme will ultimately rest with the Scottish government and Marine Scotland and their enthusiasm for a streamlined regulatory approach. The ask is simply that an exceptional decision is made for an extraordinary outcome. We are ready to deliver a self-sustained development that will decarbonize the UKCS and be the single biggest emissions abatement project to date.”

MORE INFO ceruleanwinds.com

Mayflower Wind, Anbaric announce offshore agreement

Mayflower Wind and Anbaric Development Partners recently announced they have signed an agreement for Mayflower Wind to use transmission assets developed by Anbaric to bring offshore wind to Brayton Point. Mayflower Wind will bring clean offshore wind energy from its federal offshore energy lease area to Brayton Point, which will lay the foundation for the broad repowering of Brayton Point.

Brayton Point’s robust grid infrastructure and waterfront location make it an ideal interconnection location for offshore wind. The Mayflower Wind offshore wind-energy project will use state-of-the-art high voltage direct current technology that minimizes marine cabling, reduces energy losses, and strengthens the New England grid. Over the past three years, Anbaric has taken steps to develop the site as an optimal location to integrate



Mayflower wind project infrastructure. (Courtesy: Mayflower Wind)

offshore wind into the New England electric grid. Throughout that time, there have been many collaborative conversations between Anbaric and Mayflower about the electrical connection that would be a key element in the regeneration of Brayton Point.

When fully built out, and with continuing advancements in wind technology, Mayflower Wind's lease area will supply more than 2,000 MW of offshore wind, enough to power nearly a million homes. Mayflower Wind's use of the existing grid connection will help set in motion the development of supporting infrastructure at Brayton Point needed to revitalize the former coal plant site and enable Somerset and the South Coast to benefit from the rapidly expanding offshore wind industry. This cable landing in Somerset will supplement Mayflower's long-standing and continuing efforts in Falmouth on Cape Cod.

"Mayflower Wind is committed to helping Massachusetts and New

England achieve their ambitious clean-energy goals," said Mayflower Wind CEO Michael Brown. "The transmission infrastructure at Brayton Point initially developed by Anbaric, and now owned by Mayflower, will help us make those goals a reality. We look forward to collaborating with the community as we invest in and develop this project to bring clean energy to Brayton Point and beyond."

"We are thrilled to be collaborating with Mayflower Wind to bring our unique expertise to scale offshore wind and achieve renewable energy goals," said Anbaric CEO Clarke Bruno. "Brayton Point is a unique site to bring offshore wind to our shores while also bringing infrastructure investment and responsible development to the local community."

For 50 years, Brayton Point was home to the 1,600-MW coal-fired Brayton Point Power Station, the largest coal-fired power plant in New England and the last in Massachusetts. The

plant was closed in 2017, and in 2019, Anbaric presented a vision to create a Renewable Energy Center on the site of the shuttered plant. One aspect of that vision was bringing power ashore at Brayton Point — Mayflower Wind is now moving to translate that element into reality.

Mayflower Wind is continuing with its efforts in Falmouth, Massachusetts, to connect its first 804-MW project into the New England electric grid via the Cape Cod interconnection point.

"Massachusetts just issued its third solicitation to bring up to another 1,600 MW of offshore wind online," Brown said. "Mayflower Wind looks forward to delivering on the Commonwealth's commitments to achieve net zero carbon emissions by 2050. Our position at Brayton Point only strengthens our efforts to provide additional clean offshore wind energy to New England." ✨

MORE INFO www.mayflowerwind.com



Denso®

ANCHOR BOLT PROTECTION

Denso ColorTape provides anchor bolt protection with one easy step. The petrolatum tape has over a 92 year history of providing corrosion protection in severe environments. It will provide the protection that anchor bolts need to keep the wind turbines operating.

Since 1883
138
Years Service to Industry

DENSO COLORTAPE™

Primer Integrated Petrolatum Tapes

EASY TO APPLY BY HAND

Easily Conforms to All Shapes and Sizes

www.densona.com
Call: 281-821-3355
E-mail: info@densona.com

IN FOCUS

SAFETY ▸ WIRES & CABLES

SAFE CONTINUED OPERATION OF WIND TURBINES





After 20 years, most wind-energy converters (WEC) reach the end of their design life. Where subsequent repowering is not an option, operators must assess whether continued operation may be a viable alternative to dismantling.

By PAUL TAYLOR, FLORIAN WEBER,
and CHRISTIAN SCHUMACHER

For design reasons, most wind-energy converters (WEC) have a design life of 20 years. At the end of this period, owners or managers can choose whether to either dismantle or repower the WEC, or continue its operation. Dismantling is the inevitable option in the long term, when servicing and maintenance costs of the WEC exceed the income it generates. Furthermore, repowering is not always an option or may be undesirable for organizational or economic reasons, such as new regulations governing distance or land-use reclassification as a nature reserve.

In cases where repowering is out of the question and the power generated by the WEC covers at least the operating costs, continued operation is often the most sensible solution. The extent to which lifetime extension of WECs is worthwhile must be assessed on a case-by-case basis. Critical factors include yield expectations and the costs involved in operation, such as maintenance contracts. From a business and logistical perspective, it may be sensible for managers to delay dismantling and set their own date for the process. By doing so, managers of larger wind farms can stagger or flexibly schedule work and thus optimize costs. TÜV SÜD recommends that wind-farm managers act at an early stage in order to ensure compliance with all legal and technological requirements.

EXPERT OPINION BASED ON BWE PRINCIPLES

Once the marketing situation has been clarified, owners and managers require reliable information of the costs and efforts involved in continued operation. Working with manufacturers, operators, authorized experts, official authorities, and lawyers, the German Wind Energy Association (BWE) drew up *Basic Principles for Performing an Assessment and Verification of the Lifetime Extension of Onshore Wind Energy Converters (LTE)*. Among other aspects, LTE establish the criteria for safe continued operation. The expert opinions

For turbines that have been periodically inspected in line with the regulations and regularly serviced, the chances of lifetime extension beyond their original design life are good. (Courtesy: TÜV SÜD)



Wind-farm owners and managers should investigate the possibility of lifetime extension at an early stage. (Courtesy: TÜV SÜD)

drawn up by TÜV SÜD are based on the BWE principles and provide precise information about the remaining structural reserves and the type and extent of maintenance activities required. The normative and regulatory requirements are set forth in the current DIBt guideline and the IEC 61400-1. LTE can be used to prove to the competent licensing authorities and insurances that the WEC qualifies for continued operation.

The expert opinion is based on the original design conditions of the WEC and examines the loads to which the wind turbine has been exposed throughout its service life up to that point. Available load reserves are determined in the form of a load comparison, which considers the design conditions on the one hand and conditions at the site on the other. The assessment comprises a theoretical analysis and a practical part.

THEORETICAL ANALYSIS OF STRUCTURAL RESERVES

In theoretical analysis, the data relevant for determining the service life of the WEC are compiled and evaluated. They include performance data, but also weather-related data, such as the mean wind speeds and turbulence intensities of the last 20 years. The analysis must also consider structural and topographic changes at the site, such as clearance of an adjacent forest or extension of a wind farm; these cause changes in wind conditions, and thus, in the stresses to which the WECs have been exposed.

Using the collected data and the design conditions established in type certification as a basis, the experts calculate the theoretical life of the converters. At the turn of the millennium, the design approach applied to WECs tended

Analysis of the WEC's design delivers further information on how lifetime may be extended. (Courtesy: TÜV SÜD)

to be on the conservative side. This is confirmed by computer-aided analysis of the data material, showing sufficient load reserves in most instances.

Analysis of the WEC's design delivers further information on how lifetime may be extended. It identifies the monitoring measures that should be used and the priority components to be replaced to ensure safe continued operation of the WEC throughout the targeted period. This mainly concerns components that are essential for operational and structural safety.

DETAILED ON-SITE ASSESSMENT OF THE STATE OF REPAIR

Parallel to theoretical data analysis, the team of specialists carries out detailed on-site inspection of the turbine. The experts inspect and document the state of repair of all turbine components, from the foundation and tower to the nacelle and rotor blades. They also evaluate the results of periodic technical inspections. In this context, the experts focus particularly on load-bearing parts such as safety devices and control and braking systems. Drawing on their long-standing experience, they also check for the typical vulnerabilities of the various turbine types. In a last step, the experts determine whether there have been any structural or landscape changes in the environment that have not yet been modeled in theoretical data analysis.

CLUSTER ANALYSES FOR LARGE-SCALE WIND FARMS

Case-by-case inspections may prove sensible where managers' intent is to achieve the maximum lifetime extension of a specific installation. However, for most large wind farms, they do not make good economic sense even in the case of a positive result. Given this, TÜV SÜD has developed a clustering method that allows wind farms to be assessed as a whole. Cluster analysis is possible where the site-related conditions to which a group of WECs is exposed are similar and consistent throughout the service life. In this case, cluster analysis reduces both the time and costs of assessment.

Managers obtain an overview of the state of repair of their WEC portfolio and know when and where maintenance and servicing activities will be required and to what extent. They can thus plan the continued operation of their WECs up to a point of time of their own definition, including investments for repairs and modernizations. An understanding of the technical and financial aspects of continued operation facilitates scheduling of subsequent dismantling or repowering measures and their integration into the wind-farm development plan.

The procedure is largely automated. Managers can expect a result within only four weeks. Established industrial software is used for computer simulation and load calculations. For data recording during on-site inspection, TÜV





In cases where repowering is out of the question and the power generated by the WEC covers at least the operating costs, continued operation is often the most sensible solution. (Courtesy: TÜV SÜD)

SÜD uses an app especially developed for this purpose. The app automatically processes the collected data and can create up-to-date inspection reports at all times.

LIFETIME EXTENSION POSSIBLE IN MOST CASES

Most WECs have been designed for stronger wind conditions than those prevailing at the site of the wind farm. For turbines that have been periodically inspected in line with the regulations and regularly serviced, the chances of lifetime extension beyond their original design life are good. This is in line with the inspectors' experience and applies particularly to small- and medium-sized wind farms and to WECs that have been rarely, if at all, exposed to extreme weather conditions.

In their opinions, the experts not only point out which

parts need to be replaced or overhauled, but they also check whether targeted monitoring measures might also be sufficient to ensure safe continued operation over several years. Effective measures do not necessarily result in high investments. Replacing badly worn parts, such as cable sheathing and repairing surface defects such as corrosion or touching up protective coating is often enough.

UP-TO-DATE EXPERT OPINIONS ARE HELPFUL

Wind-farm managers should address the issue as early as possible and commission an impartial third party to carry out the required inspections of the WECs. To ensure smooth and fast expert reports, managers should collate all necessary documentation in the runup to assessment. This necessary documentation comprises the WEC license and

DESIGN LIFE

- Manufacturers calculate the service life of a WEC on the basis of the load to which the WEC will be exposed in all probability.
- The input parameters required for calculation include wind, special features during operation, and weather conditions.
- All safety-related components are devised, designed, and dimensioned to withstand the loads during this period.
- The original design life is 20 years in most cases or 25 years in exceptional cases.
- As a general principle, owners and managers can rely on the structural safety of their WECs if the turbines have been serviced and maintained in line with the regulations and inspected periodically and if all defects have been repaired without delay.

all documentation related to WEC installation and commissioning but also all data related to operation and yield, all servicing, maintenance, repair and test reports, and wiring and hydraulic diagrams. On top of this, an expert report dating back no longer than 12 months and documenting the state of repair of the rotor blades must be provided.

Customers benefit from the one-stop services, i.e. the fact that they obtain a single complete report for all of their WECs from one service provider. The easy-to-understand document provides transparency with respect to the costs and logistics efforts involved in servicing and maintenance during the remaining service life, and helps to develop optimized concepts.

CONCLUSION

Wind-farm owners and managers should investigate the possibility of lifetime extension at an early stage. In many cases, lifetime extension offers a cost-effective alternative to dismantling. A positive expert report on lifetime extension ensures transparency and predictability. As a third-party testing, inspection, and certification body, TÜV SÜD inspects both individual WECs and wind-farm clusters. Within six weeks, owners and managers obtain a test report in line with the principles of the German Wind Energy Association (Bundesverband Windenergie, BWE). ✎

ABOUT THE AUTHORS

Paul Taylor is head of Industrial Products (U.K.) at TÜV SÜD Limited. Florian Weber and Christian Schumacher are with the Wind Service Center at TÜV SÜD Industrie Service GmbH. For more information, go to www.tuvsud.com/wind-power.



At Northrop Grumman we don't just develop the answers – we invent the question. Our Mission Systems team is hiring in support of our customers. Are you ready to define possible?

Job ID	Job Title	Location	Clearance Level
21009874	Gear Front Line Manager 2	Sunnyvale, CA	None

Questions about this opening?
Contact Anne-Marie.Moschera@ngc.com or
Autumn Halstead Autumn.Halstead@ngc.com

The search for your new career starts [here](#). Join us.

ngc.com/careers

© 2020 Northrop Grumman is committed to hiring and retaining a diverse workforce. We are proud to be an Equal Opportunity/Affirmative Action Employer, making decisions without regard to race, color, religion, creed, sex, sexual orientation, gender identity, marital status, national origin, age, veteran status, disability, or any other protected class. U.S. Citizenship is required for most positions. For our complete EEO/AA and Pay Transparency statement, please visit www.northropgrumman.com/EEC

GET CONNECTED

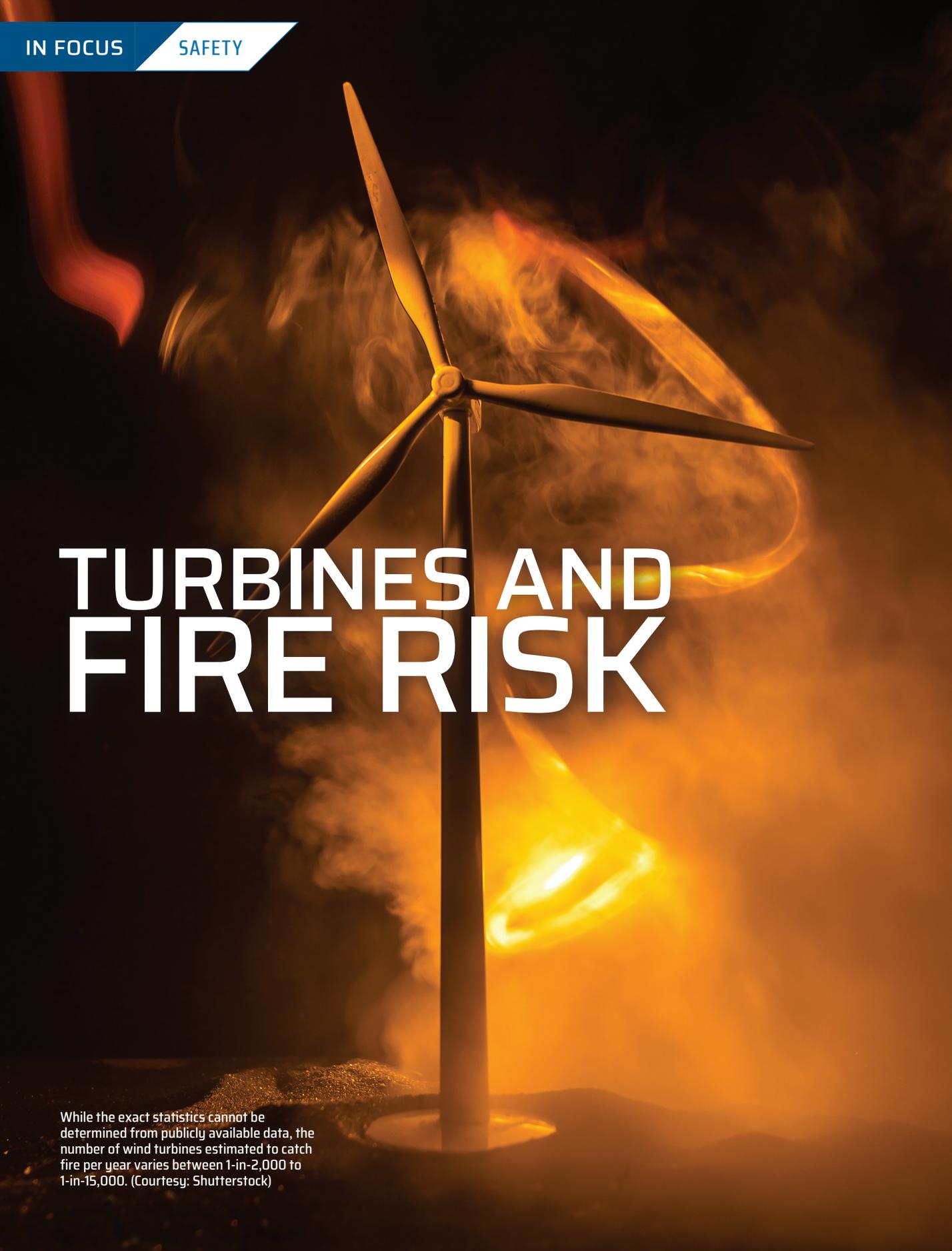
WindSystemsmag.com is your online authority for information about the wind energy industry.

You'll find topical articles, company profiles and interviews with industry insiders, and timely wind energy news.

Giving Wind Direction

WIND SYSTEMS

Get your FREE subscription, plus our online content, at www.windsystemsmag.com

A dramatic photograph of a wind turbine at night, engulfed in bright orange and yellow flames. The turbine's three blades are silhouetted against the fire, and the tower is partially visible. The background is dark, with the fire providing the primary light source.

TURBINES AND FIRE RISK

While the exact statistics cannot be determined from publicly available data, the number of wind turbines estimated to catch fire per year varies between 1-in-2,000 to 1-in-15,000. (Courtesy: Shutterstock)

As more and more wind turbines are being built, dealing with the possibility of a turbine fire should be an important step for the wind-farm owner-operator.

By ANGELA KRCCMAR

The wind industry is undergoing a period of unprecedented growth as part of the nation's efforts to fully decarbonize the U.S. energy system by 2035. Tens of thousands of wind turbines are expected to be installed over the next few years — and with this boost in numbers comes both an increase in expected frequency and greater public scrutiny over wind turbine fires.

FIRE RISK AND WIND TURBINES

Wind-turbine fires are relatively rare. While the exact statistics cannot be determined from publicly available data, the number of wind turbines estimated to catch fire per year varies between 1-in-2,000 to 1-in-15,000. However, as more turbines are installed and existing assets age, the frequency of wind-turbine fires is likely to increase.

While steps already are being taken to “design out” as much fire risk as possible for new turbines, older turbines are likely to retain features that could put the asset at risk.

Additionally, while newer turbines have features such as lightning protection systems being installed during production, many high-risk features cannot be removed from the design without seriously affecting generation.

For example, convertor and capacitor cabinets and transformers are two of the most common points of ignition for a wind turbine, as an electrical failure can result in the production of sparks and heat. However, these parts are vital for the turbine to convert wind energy into electricity.

As fire risk cannot be completely designed out, it stands to reason that wind-farm owner-operators should act to prevent their assets from catching fire once operational — or face serious consequences.

THE COST OF A WIND-TURBINE FIRE

A wind-turbine fire can cost upwards of \$8 million, according to insurance experts quoted in Firetrace's recent report, “Reducing Fire Risk.” As most wind-turbine towers exceed 250 feet, they are often out-of-range for ground-based fire-fighting. Sending a team up to fight the fire presents a significant health and safety risk. Therefore, if no fire suppression system is in place, it will be left to burn out, irreparably damaging the turbine.

While insurance frequently covers fire damage, the cost of managing increasingly large claims is pushing the market into a “hard” state, wherein premiums are raised and policies become much stricter. Acting to reduce fire risk could enable insurers to offer more favorable policies without taking on excess risk — reducing overall costs for wind-farm owner-operators.

Fire risk is not only a concern for the wind farm's balance sheet. A wind-turbine fire can spread to the surrounding environment, sparking wildfires and potentially spreading into nearby communities. As such, stakeholders at the government and community level are likely to push for regulatory changes to ensure any wind-turbine fires are suppressed before the flames can spread beyond the asset.

▼ A growing number of both local and state governments in the U.S. are acknowledging that fire suppression in wind is a necessary step to safeguard wind projects and the surrounding environment and property in the event of a fire. ►

WHAT ARE THE REGULATIONS FOR FIRE PREVENTION, DETECTION, AND SUPPRESSION?

Currently, all power plants across the U.S. must comply with National Fire Protection Association (NFPA) standards in order to ensure their operations are sufficiently safe. Coal, gas, and nuclear are all regulated to ensure sufficient fire detection and suppression systems are installed in order to guarantee the safety of on-site personnel.

However, wind is not regulated to the same degree. In part, this is due

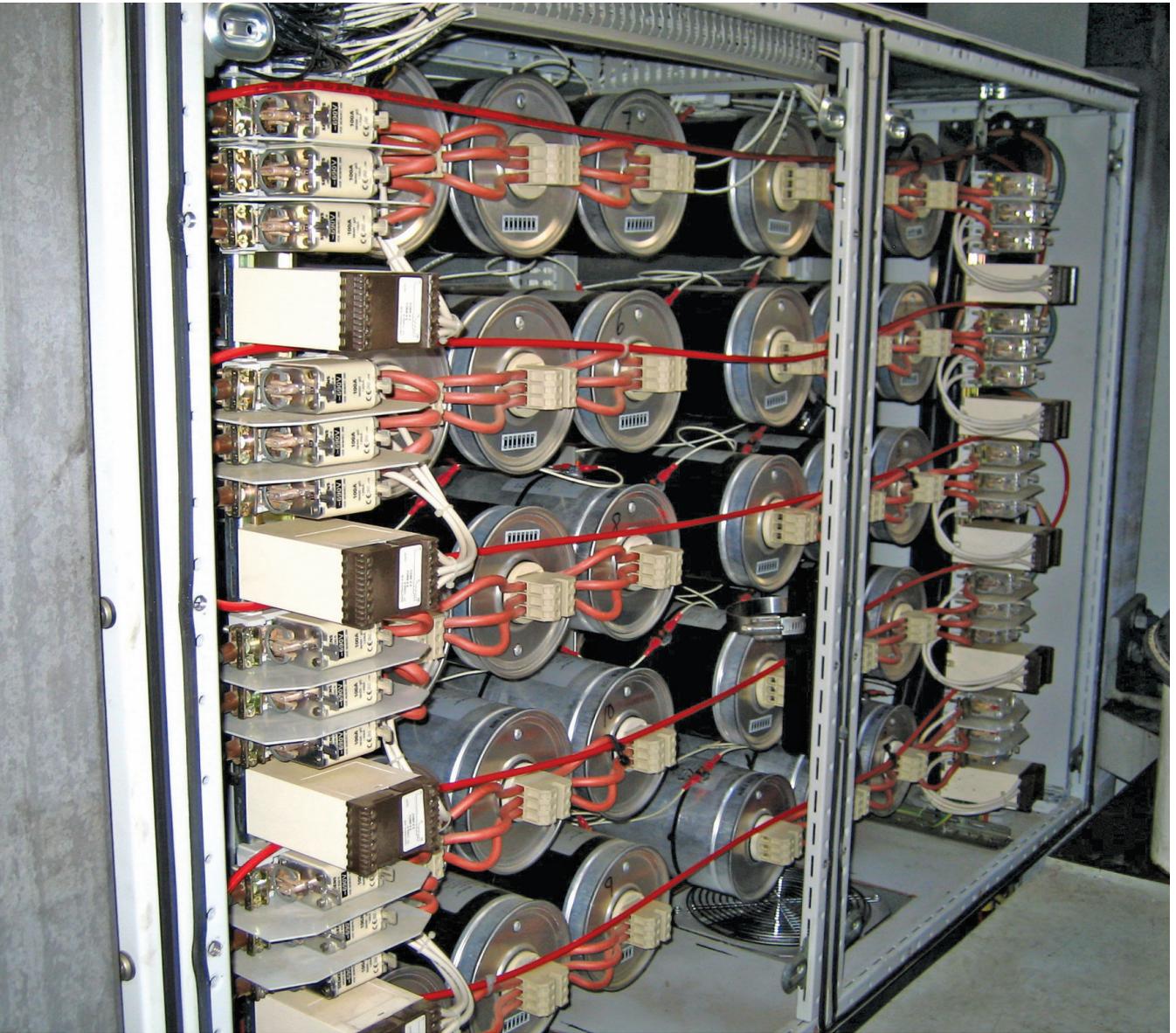
to the relative “newness” of wind compared to other power-generation types. Coal- and gas-run generators have been used to produce electricity for centuries with nuclear in widespread use across the United States since the 1950s.

The wind industry also has a much safer record than coal, gas, or nuclear, which all have had historical fire incidents with multiple fatalities that prompted swift regulation.

As such, while NFPA 850, the code for fire safety in power generation, does provide a standard for wind-turbine fire safety, fire detection and suppression systems are only recommended and not required.

However, a growing number of both local and state governments in the U.S. are acknowledging that fire suppression in wind is a necessary step to safeguard wind projects and the surrounding environment and property in the event of a fire.

In New Hampshire, for example, a legal dispute was sparked between the fire marshal and a leading utility over whether a wind farm followed the state's fire code. This



Fire suppression systems can protect turbines by detecting and extinguishing fires. (Courtesy: Firetrace)

dispute was resolved once the utility retrofitted fire suppression systems to the project.

Outside the U.S., a number of countries and regions are starting to mandate fire suppression for new projects. For example, German standards from the Vertrauen durch Sicherheit (VdS) and DNV GL both include fire protection and suppression in their renewables project certification guidelines.

In Canada's Ontario province, fire suppression is not only mandated for installation in new energy projects but is also required to be retrofitted to existing sites.

It is only a matter of time before a similar level of scrutiny over fire protection is rolled out on a national scale in

the U.S. The wind industry must ensure it is proactive in ensuring it is following best practice for preventing and suppressing fire.

Proactively managing fire risk doesn't just enable owner-operators to prepare for upcoming regulations – it also can help maintain positive relations with local stakeholders and surrounding communities. By taking steps to prevent and suppress fires, owner-operators can avert damage to not only individual assets, but the wider industry's reputation for safety and environmental protection.”

ABOUT THE AUTHOR

Angela Krcmar is the global sales manager for Wind at Firetrace.

GET CONNECTED

WindSystemsmag.com is your online authority for information about the wind energy industry.

You'll find topical articles, company profiles and interviews with industry insiders, and timely wind energy news.

Giving Wind Direction

WIND SYSTEMS

Get your FREE subscription, plus our online content, at
www.windsystemsmag.com

TECHNOLOGY, INFRASTRUCTURE KEY TO U.S. OFFSHORE SUCCESS



Nexans brings energy to life

Nexans is at the forefront of the cable technology required for floating wind, proven by the supply of dynamic cable solutions for Equinor's Hywind Demo and Hywind Scotland floating wind farm projects.

Offshore wind is vital to President Biden's pledge to reduce carbon emissions in the U.S., but challenges such as LCOE decreases, supply chain issues, protracted regulatory approvals, and the continued need for investment to upgrade the onshore transmission network remain.

By RAGNHILD KATTELAND

The Biden administration made news earlier this year with a bold pledge to reduce the United States' carbon emissions by at least 50 percent by 2030. This target more than doubles the country's prior commitment under the 2015 Paris Climate Agreement when the Obama administration set out to cut emissions 26 to 28 percent below 2005 levels by 2025.

One of the key pillars of this effort is the deployment of offshore wind power — a resource that has gone largely untapped until recently in the U.S. wind turbines installed offshore, where wind speeds are higher, more stable, and more predictable, can produce more electricity than those placed on land. Combined with better weather and power flow modeling, offshore wind has the potential to generate a significant proportion of the United States' energy in the decades to come.

SUBSTANTIAL GROWTH

The offshore wind industry is poised for substantial growth in the United States, with projections anticipating more than 10 GW in operation by 2030 and with another 20 GW in development. In addition to delivering renewable affordable power, the offshore wind industry is expected to generate a variety of economic benefits to the U.S. economy, including tens of thousands of jobs, investment in a U.S. supply chain from Maine to Texas and eventually the West Coast, billions of dollars in economic output, and investment in grid and coastal infrastructures.

The current wave of offshore wind projects started in 2018, driven by states' public policies on energy and on carbon footprint reduction in New England, New York, New Jersey, Maryland, and Virginia. In January of this year, the New York State Energy Research and Development Authority (NYSERDA) selected Empire Offshore Wind LLC to develop the 1,260 MW Empire Wind 2 and the 1,230 MW Beacon Wind 1 offshore wind projects planned for deployment south of Long Island and east of the Rockaways. The New Jersey Board of Public Utility was expected to award at least 1.2 GW by the end of June. And in early 2021, Dominion submitted its commercial and operation plan for the Coast Virginia Offshore Wind project, a 2.6 GW wind farm.

CHALLENGES REMAIN

US offshore wind came further along in March when the Biden administration announced a set of bold actions designed to catalyze this energy resource, strengthen the domestic supply chain, and create good-paying American jobs.

While these developments are good signs for the offshore

wind sector, obstacles and challenges remain to reduce the levelized cost of energy (LCOE), to build up an efficient U.S. supply chain, with protracted regulatory approvals, and with the need to upgrade the onshore transmission network for offshore energy injection on the electric grid.

Early state procurement targets in the Northeast are jumpstarting the industry. The current LCOEs are offset by wholesale power prices that are generally higher than in other regions. As LCOEs continue to decrease due to continued improvement in turbine and transmission technology, offshore wind will become a viable solution farther down the East Coast and into the Gulf of Mexico.

WEST COAST OFFSHORE PLANS

Available technologies and their current costs will be a factor to bringing offshore wind to the West Coast. Water depth off the West Coast drops much deeper much closer to the shoreline than on the East Coast. Turbines will not be able to be affixed to the seabed to capture wind energy. Instead, those states will rely on floating wind farms. In Europe and Asia, significant investment is underway to deploy and industrialize that technology. This will allow the LCOE of floating wind to rapidly go down to the benefit of projects in the U.S. Nexans is at the forefront of the cable technology required for floating wind, proven by the supply of dynamic cable solutions for Equinor's Hywind Demo and Hywind Scotland floating wind farm projects.

The technologies to create a net-zero emission efficient energy mix are available. The electric grid on the other end is aging and was designed for another era of electric generation. It will need to be upgraded to increase transmission capacity and flexibility to handle complex power flow from renewable energy sources, and interregional strong connections will need to be developed to bring together the full mix of renewable energy sources.

HIGH U.S. EXPECTATIONS

There is a great expectation that the U.S. offshore wind industry will foster a domestic supply chain, but the current U.S. supply chain could thwart a robust offshore wind development. A U.S. supply chain can grow and strengthen over time with domestic manufacturers and service providers reallocating their assets to meet the needs of this new industry along global OEMs investing in U.S. manufacturing facilities. Nexans, for instance, has invested more than \$300 million in its high voltage cable plant in Charleston, South Carolina, doubling down its initial investment with a \$220 million retrofitting of its facility to manufacture undersea



Available technologies and their current costs will be a factor to bringing offshore wind to the West Coast. (Courtesy: Nexans)

cables needed for offshore wind projects. Nexans believes the pace of investment in a domestic U.S. offshore wind supply chain can and will accelerate with proper supporting public policies.

At the top of the priority list of issues to tackle are the regulatory uncertainties that so far have caused multiple delays and added costs to offshore renewable energy projects. Despite the latest improvements as seen with the Vineyard Wind approval and the latest agreement between Bureau of Ocean Energy Management and U.S. Army Corps of Engineers to alleviate the permitting logjam, permitting predictability remains a major concern.

The U.S. is back on board with the Paris Climate Accord, intended to seriously pursue climate change initiatives and to invest into the energy mix of the future. Nexans believes the goals set out by the current administration can be achieved with a coordinated effort between public and private stakeholders of the energy transition. ✍

ABOUT THE AUTHOR

Ragnhild Katteland is executive vice president for the Subsea & Land Systems Business Group at Nexans.



The offshore wind industry is poised for substantial growth in the United States. (Courtesy: Nexans)

YOUR SOURCE FOR WIND ENERGY NEWS

For 10 years, *Wind Systems* magazine has been a leading authority on the wind-energy industry and its place in the world as a stable and sustainable source of renewable, clean energy.

Each issue, *Wind Systems* offers the wind industry workforce timely, valuable information from key segment players in order to increase its readers' knowledge of the wind industry's positive future.

Best of all, it's free to you. All you need to do is subscribe.

JOIN THE *WIND SYSTEMS* COMMUNITY FOR ONLY \$350 PER YEAR



On windsystemsmag.com, we have paired our vast archives with the latest web technologies to develop the most efficient, streamlined, user-friendly web experience in the wind-energy industry.



SUBSCRIBE FOR FREE
www.windsystemsmag.com

Giving Wind Direction
WIND SYSTEMS

PROFILE

PATRIOT INDUSTRIAL SOLUTIONS

STRIVING TO IMPROVE SAFETY, QUALITY, AND PROFITABILITY

**PATRIOT INDUSTRIAL
SOLUTIONS**

FOUNDED
2014

HEADQUARTERS
Moore, Oklahoma

WEBSITE
www.patriotind.com

For more than seven years, Patriot Industrial has offered products and services for the wind-energy industry. (Courtesy: Shutterstock)

Patriot Industrial Solutions offers bolting equipment and climb-assist and emergency-descent equipment, as well as custom-engineered solutions for the wind-energy industry.

By **KENNETH CARTER** ▶ Wind Systems editor

Wind farms, and the dozens of turbines that comprise them, are made up of thousands of parts. And every one of those parts must be monitored and maintained to ensure the best efficiency for each asset.

That's where Patriot Industrial Solutions comes in.

For more than seven years, Patriot Industrial has offered products and services for the wind-energy industry that include emergency-descent equipment, climb-assist equipment, and hydraulic torque/tension controlled bolting equipment, according to Dan Erickson, president and founder of Patriot Industrial.

"In addition to sales for all of that, we also service and rent most of the products we offer," he said. "I can build custom tools, and we also offer ultrasonic bolt load testing equipment. We have a wide array of core services for the O&M side of the business."

LONG HISTORY WITH WIND

Erickson said he has been involved in the technical and industrial sales to the wind energy, as well as other industries, for many years before starting Patriot Industrial in 2014 where he and his company have focused on controlled bolting, as well as through engineering and industrial sales jobs.

Before starting Patriot Industrial, Erickson was selling to wind while an industrial rep for Snap-on and for HYTORC.

"I've been bringing solutions to wind since 2005 with custom kits and custom tooling," he said. "Later, I migrated into a total focus on controlled bolting at the end of 2010."

Now, Patriot Industrial has divided its focus on wind to about 80/20, expanding its product lines to address other needs in the wind and renewable industries, according to Erickson.

"I've always been involved with wind, but over the past four to five years, I have really changed my company's focus into wind," he said.

THE BEST SOLUTIONS FOR ANY APPLICATION

As the wind industry has expanded over the years, wind-farm owner-operators have branched out to rely more on third-party O&M companies, and Erickson pointed out that is a relationship that serves his company well.

"Patriot is not owned by any of the vendors whom I represent and, therefore, can provide the best solution to the application," he said. "And that is my M.O. — I am able to have Patriot focused on customers' specific needs rather than the inverse."

A large part of Patriot Industrial's contribution to wind is a commitment to lighter-weight equipment and climb assist and emergency descent systems, according to Erickson.

"Some of that can be used for other towers; emergency descent equipment can be used on cell towers, TV towers, smokestacks — that type thing — but they are used heavily in wind," he said. "Every crew that goes up a tower should have an emergency-descent system with them. And the industry is moving toward a multi-person emergency-descent system so that, should one individual become incapacitated, that emergency-descent system can support an additional team member to keep that injured individual viable and assist them down. There's a shift from the single person emergency descent kits to a multi-person descent kit. They're both in existence, but there's a movement to those multi-person requirements."

WIND-SPECIFIC EQUIPMENT

The industry-leading TRACTEL climb-assist equipment Patriot Industrial offers is used almost entirely by the wind industry, according to Erickson.

"It is a rugged equipment solution to enhance tower up-time and employee satisfaction," he said. "And it just reduces the wear-and-tear on technicians having to climb all day, every day. Instead of two towers, they may be able to climb four, and they're not exhausted when they're up there — never mind if it's minus-20 degrees Fahrenheit or 105 degrees Fahrenheit. The quality of work improves, quality of attitude improves, and tower up-time improves."

TAKING ON CHALLENGES

Even though Patriot Industrial offers a wide variety of O&M products and services, Erickson said he approaches each customer request with a resolve to solve the challenges presented to him.

"I try and educate," he said. "I have to educate myself about the application first with thorough questions, and, if necessary, I'll go onsite and take a look at what's happening and then educate the customer on their options as if I were them. I want to actually educate them as to what their decision criteria needs to be, so it can be effective for the total life expectancy and total cost of ownership for whatever they're purchasing."

Patriot Industrial also has the ability to move quickly on tooling and custom design, according to Erickson.

"We can manufacture to customer needs and specifications for many products, including tools, sockets, harnesses and more," he said. "We have the ability to move quickly and have the skills and avenues to address many applications."

APPROVED VENDOR

Patriot Industrial is an approved vendor for many of the major OEMs in the industry, but the company also offers



A large part of Patriot Industrial's contribution to wind is a commitment to lighter-weight equipment and climb assist and emergency descent systems. (Courtesy: Patriot Industrial)

its products and services to wind farms directly, no matter where they may be located, according to Erickson.

"We're not geographically constrained, so I've got projects for third-party providers and for specific wind farms in Nebraska, California, New Mexico, Colorado, Oklahoma, Kansas, and more," he said. "And I have been on site in North Dakota; I've been on site in Iowa, as well as all the other states that I've mentioned."

And Erickson said he is excited about the prospects of U.S. offshore projects taking off.

"I am looking forward to offshore opportunities," he said. "That's an entire new ball of wax for renewables and particularly wind, and I am glad to see it happening. Renewables are a critical part of our energy infrastructure as we move forward, and offshore just opens the horizon for wind, because the geographical constraints aren't as tight, and you don't have size constraints. You can go to bigger turbines for greater economies of scale on output. I think offshore is going to be fantastic for the entire industry."

CENTRALLY LOCATED

Patriot Industrial is centrally located in the U.S., which gives the company an advantage to respond quickly to the needs of owner-operators across the country, according to Erickson.



The industry-leading TRACTEL climb-assist equipment Patriot Industrial offers is used almost entirely by the wind industry, according to Patriot Industrial President Dan Erickson. (Courtesy: Patriot Industrial)

"We're centrally located," he said. "The highest wind speeds in the United States resemble an inverted kidney bean. So, if you look at the highest average wind speeds, they're in southeast Colorado, a good chunk of Nebraska, almost all of Kansas, the western three-quarters of Oklahoma, and north and west Texas into eastern New Mexico. We are right in the core of land-based wind central."

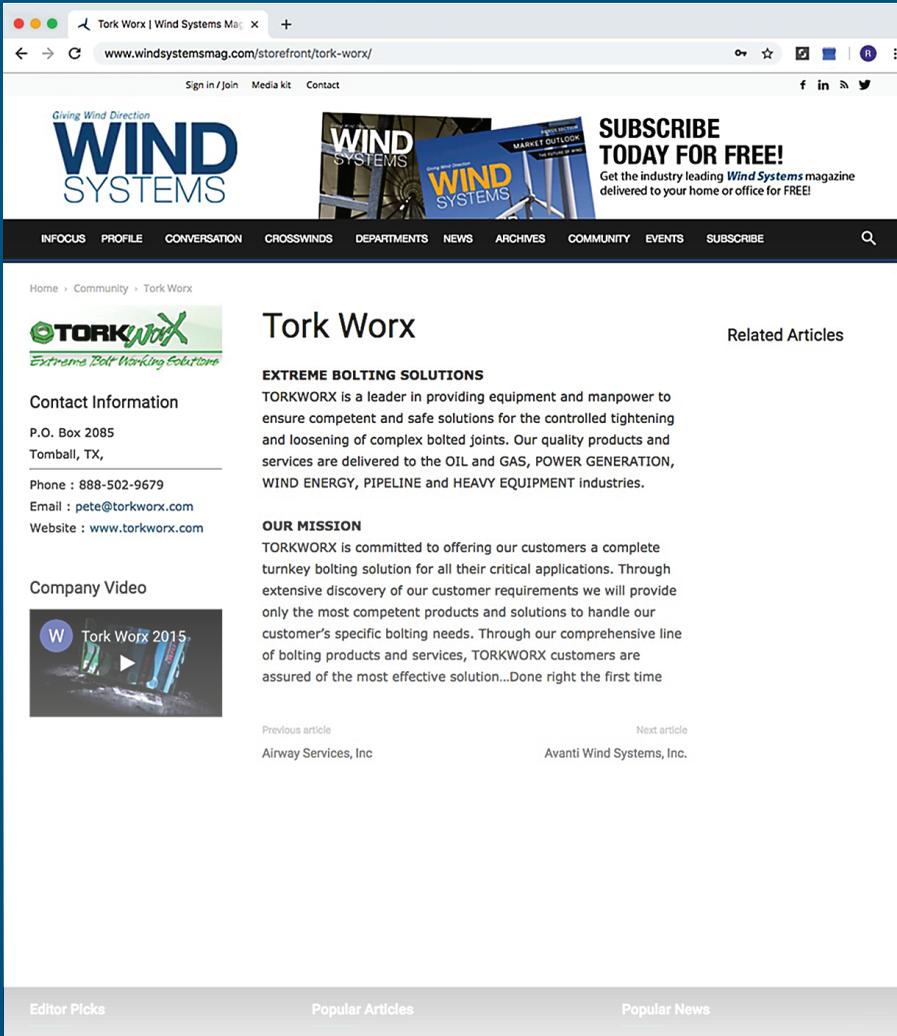
Erickson said he has seen a number of beneficial changes within the industry over the last 30 years. One major change is how the life expectancies of components have increased tremendously.

"The industry is sustainable on its own without prop-ups such as tax credits and other things," he said. "And the demand for clean energy is going to continue to grow, so the services required by this industry will continue to grow. And my plans are to be heavily involved in that as it grows."

To that end, Patriot Industrial has multiple vendors for bolting equipment and tension equipment, selling directly to big OEMs such as Siemens Gamesa, GE, Vestas, and more, according to Erickson.

"We're able to be competitive through skill level, product offering, and solution engineering, offering a quick response while staying competitive price wise," he said. ↵

ARE YOU MAXIMIZING YOUR EXPOSURE?



Connect your company to the wind-energy industry with a storefront in the Wind Systems Community.

Storefronts paint a portrait of your company with a 500-word description and include your logo, website link, phone number, email addresses, and videos. Your social media pages such as Twitter and Facebook are integrated with live updates, which may also be re-posted through our social media feeds.

With a community storefront, your company also receives a premium listing in the annual Buyer's Guide published each November. Premium listings feature graphic treatments to draw more attention to your company.

JOIN THE *WIND SYSTEMS* COMMUNITY FOR ONLY \$350 PER YEAR



For information on how you can participate in the windsystemsmag.com community storefront, contact dave@windsystemsmag.com.

Dave Gomez - national sales manager
800.366.2185 x 207

Giving Wind Direction
WIND SYSTEMS



Tim Boettcher

President and Founder ▸ Amazing Magnets

“Our goal, really, is to help those end users use magnets to solve problems. We engineer solutions for them.”

Magnets are used in literally thousands of applications, including wind turbines. *Wind Systems* recently had the opportunity to talk with Tim Boettcher, president and founder of Amazing Magnets, where he discussed how magnets are created and where they're used in renewable-energy applications.

▸ What does Amazing Magnets do?

The mission of Amazing Magnets is to design, develop, and produce innovative magnetic products that simplify everyday living. We want to make things easy for customers — easy to order, easy to help them design and engineer, easy to purchase.

Our primary business is to sell to OEMs, so we are selling to people in a variety of industries where they're developing new products or expanding existing products, and we work with small companies as well as industry leading companies. We sell magnets that are small and magnets that are big. We do incorporate them with metal assemblies and plastic-injection molding. Our goal is to help those end users use magnets to solve problems. We engineer solutions for them. And we sell magnets online. And for the most part, we want to educate our customers and help them really understand how magnets work so they can leverage their unique powers and qualities. Because most people do not really understand magnets, they underestimate what magnets can do.

▸ Are these permanent magnets created from rare-earth elements?

There are a lot of different kind of magnets, and our specialty is neodymium, the rare-earth magnets.

▸ What is your role with the company?

I'm the founder and president, and I give guidance and direction on specific projects, as well as keep the team focused on future goals and help them stay the course. Right now, we're building our global headquarters in Round Rock, Texas. We're part of that great migration from California to the Silicon Valley of the Austin, Texas, area. Most of our team is

still in Anaheim, California, while the new headquarters is being constructed. I'm overseeing that project, and I lead the engineering and IT teams.

It's going to be as much a workspace as it is a living and learning laboratory.

▸ Bottom line, what's so amazing about magnets?

You know, I think it's funny, because the way we named the company was a result of selling our magnets to my connections I had built over the years, and after delivering our products to them they would say, “Man, that's amazing!” And I said, “Yep, those are amazing magnets.” And at that time, people didn't really know much about the rare earth neodymium magnets, because they were more of a rarity. But I think it's that invisible force and energy that make them truly amazing. People don't understand how they work, because magnets aren't something that you can turn off. That force and energy are always there, and it's always attracting. It's just fascinating to people. And the fact that even when I was a kid, I had these little magnetic toy dogs that I would put under the table and race them around; it was magical. And we do sell that magic.

▸ How long has Amazing Magnets been around?

We started in 2002 when I founded and started the company in my bedroom, then it moved to my garage. We've since moved three times. And this'll be our fourth big move. And each time, we've doubled in space.

▸ Since our audience is the wind industry, what should the people in the wind industry understand about magnets in general?

Magnets fall under a big category. There are the rubberized magnets, which are the kind you'd find on cars, for example. And then you've got the black ceramic magnets, which are the kind you'll see mostly in refrigerator magnets. A lot of people call them ferrite magnets, which are a little bit more powerful. And then you've got Al-Ni-Co magnets — aluminum-nickel-cobalt magnets — and those are cast and they're

made out of metal.

Then we get into the rare-earth magnets, which are cobalt and neodymium and iron boron. We focus on the neodymium magnets. Since they don't turn off, we have to work with them as they are. They need to be protected with some kind of a plating or a coating.

You need to think about: How you are going to use magnets in your application? You need to break it down. No matter how you are working with magnets, break your project down into its core components, whether it's a car or it's a wind turbine. You break it down into each individual system, and then just look at the functions, and then think about how to use the magnet's superpowers, which are things like attraction, right? Because steel doesn't attract itself. There are very few things that attract each other. But magnets can be used in things that need to mate up together, or things that need to trigger sensors like switches and sensors. Those are the things that cannot happen without the help of magnets. Those are things that can be used in all industries, including the wind industry.

► **What are some of the specific ways magnets are used in a wind turbine?**

If you start at the top — and one of our long-time customers makes anemometers — you will see that magnets are there to assist in the sensing and spinning. That's one way magnets are used in wind turbines. They can be used for braking. For example, you have to have RPM limiting on rotors, so magnets can keep the RPMs down using eddy breaking. You will probably see more of that with gearbox-less turbines that are coming out where there are fewer moving parts, with a move toward more permanent magnets rather than induction.

It used to be wind systems and different kinds of turbines used those flat, round, rotational models, and you used to have more cogging issues with startup. Now, they've moved into more of the bread-loaf-shaped magnets that have corners and edges. And now we're doing skewed magnets that are more rotational and radial and are found in the actual generator units themselves.

As you recall, we wrote an article in the May issue of *Wind Systems* addressing using magnets in the tower for ladders so as to eliminate drilling holes in the tower and compromising its safety. You could use magnets for cable management and wire management.

And with maintenance workers who use tool belts or wrist guards, magnets can be used to secure tools and be used as latching systems for wrist guards. They can also be used in sensors, access panels, read switches, door sensors, and so many other places in the turbine.

► **Are there any myths or misconceptions about magnets that our readers should be aware of?**

In general, people may think, "Where do magnets come from? We don't just dig them out of the earth, right?" They used to have a thing called magnetite, or people would say

a lightning bolt would hit the ground, and it would create magnets. It's not quite like that.

With rare-earth magnets, people want to know if they really are rare. Although the materials are quite abundant, they are not found everywhere. And they are strip mined. You can't just go dig neodymium out of the ground. It comes with other materials, like praseodymium and other elements that have to be reduced out via a multi-step process.

Because magnets are made of metal alloys, a common misconception is that we can do anything with them. Magnets are brittle, and, because of the way they're made, you can't just drill and cut them with normal tools. They're usually cut with a wire EDM or wet diamond blades. And when drilling them, they are either cutting them out with some type of tubular diamond cutter or drilling them out with more of a grinding operation.

And another important point to stress is that magnets are heat sensitive, and in the wind applications, you're going to have increased temperatures as things are rotating. There are also many different grades available, and you have to match the proper grade to the specific application. And location and environment play an important role, too. If you are around the ocean or salt, you don't want to use nickel coating. Or if you are around sand, there are ways you can protect and minimize the magnet's exposure. During the design phase, both location and environment are important considerations.

► **Anything else about the magnets that you make that you think would be appropriate for our readership?**

Another fascinating aspect of magnets is how they are made. They take the elements of earth out of the ground, and they get them into their single states such as neodymium, samarium, praseodymium, and cobalt. They then take them individually and measure them out according to a recipe and crush them into a powder. The rare-earth magnets that we're using are sintered, so they take that really fine powder and press it into a block. And when they're pressing it into this block, they expose it to a magnetic field. And that magnetic field orients each little element of that powder in a certain direction. And then they lock them in place with an extreme hydraulic pressure. They are then heated under vacuum at super high temperatures.

Once they are made into a block, they are like a piece of cheese that you can slice, grind, and cut. At the very end, the magnets will be electroplated according to your needs. It will be coated with nickel, copper, zinc, or another substance, because it will oxidize. They are also a variety of specialized coatings, such as Everlube or epoxy that give them more chemical or temperature resistance.

In that vein, Amazing Magnets is here to educate and answer any questions you might have. We're here to support and enhance the wind-turbine system industry while making everyone's jobs and lives easier. That's what we do. ✨

MORE INFO ► www.amazingmagnets.com



In preparation for laying the cable, RTE has contracted JF Renewables to identify and investigate potential UXO along the length of the cable's planned routes. (Courtesy: James Fisher Renewables)

CONSTRUCTION

James Fisher to identify UXO on RTE's grid connection

James Fisher Renewables, a trusted supplier of comprehensive offshore wind-farm solutions, has been selected by the French transmission grid operator Réseau de Transport d'Electricité (RTE) to identify unexploded ordnance (UXO) along the export cable routes for the Fécamp offshore wind project.

The 18 kilometer export cable, which will sit at depths between five meters and 35 meters, will provide the electricity transmission connection for the 71-turbine offshore wind project 13 to 22 kilometers off the north-

west coast of France. In preparation for laying the cable, RTE has contracted JF Renewables to identify and investigate potential UXO along the length of the cable's planned routes, with confirmed targets to be disposed of by the French Navy in line with regional legislation.

The contract will be fulfilled by JF Renewables' subsidiary Mojo Maritime France (MMF) and will create temporary local jobs for project supervisors, remote operated underwater vehicle (ROV) pilots and technicians, and explosive ordnance disposal (EOD) and UXO dive specialists. The award follows the successful completion of a similar UXO identification campaign last summer for RTE's grid connection of Saint Nazaire offshore wind project off the west coast of France.

"Having performed thousands of

unique potential UXO target identifications, we bring a wealth of experience that will ensure this project is delivered safely and efficiently," said Giovanni Corbetta, managing director of James Fisher's Marine Contracting Division. "We are delighted to be able to leverage our expertise working in extreme environments to help France deliver on its ambitious industrial plan for the region."

The project was expected to begin in May 2021 and complete within two months

James Fisher Renewables provides comprehensive and trusted offshore wind-farm solutions dedicated to the technical and operational aspects of construction preparation, installation, and specialist operation and maintenance.

Globally, the company's expertise has supported the construction and development of more than 17 GW of offshore wind installed capacity in under 14 years.

MORE INFO www.jamesfisherrenewables.com

CONSTRUCTION

RWE's Scioto Ridge Wind Farm in operation

RWE Renewables has started commercial operation on its 250-MW onshore Scioto Ridge Wind Farm.

The project, in Hardin and Logan counties, is powered by 75 Siemens Gamesa turbines and represents RWE's first onshore wind project in Ohio.

Scioto Ridge marks our successful entry in the Ohio market," said Silvia Ortin, COO Onshore Wind and Solar PV Americas, RWE Renewables. "The state's location in the heartland of the U.S. offers ideal conditions for renewable energy, and we are happy to bring this project online as part of our focus on the U.S. market."

"We're proud to be a member of the local community, contributing more than \$75 million in new payments over the next 25 years to the local governments, school districts, and landowners," said Silvia Ortin, COO Onshore Wind and Solar PV Americas. "We created approximately 250 construction jobs and will hire up to 10 full-time, long-term operations and maintenance people who will live and work in the area."

Scioto Ridge is RWE's 28th onshore wind farm in the U.S. and has the capacity to provide clean energy for more than 60,000 households.

"The ongoing transition to lower carbon technologies and a more diverse energy portfolio represents a significant economic development opportunity for our state," said Stephanie



Scioto Ridge is RWE's 28th onshore wind farm in the U.S. (Courtesy: RWE Renewables)

Kromer, director of Energy and Environmental Policy at the Ohio Chamber of Commerce. "We are excited for RWE's successful completion of their first Ohio-based project of over \$300 million and look forward to their continued cooperation."

Ohio has enormous potential for future projects, as wind power provides less than 2 percent of the total electricity generation in the state. In addition, Ohio has a long history of industrial manufacturing, including approximately 52 wind-related factories — the most of any single state in the U.S.

The U.S. accounts for more than one third of the RWE Group's renewables capacity playing a key role in RWE's strategy to grow its renewables business and get to net zero by 2040. RWE constructs, owns, and operates some of the highest performing wind, solar, and energy storage projects in the U.S.

As an established leader in renewables, RWE has recently entered into a joint venture, New England Aqua Ventus, focused on floating offshore wind in the state of Maine.

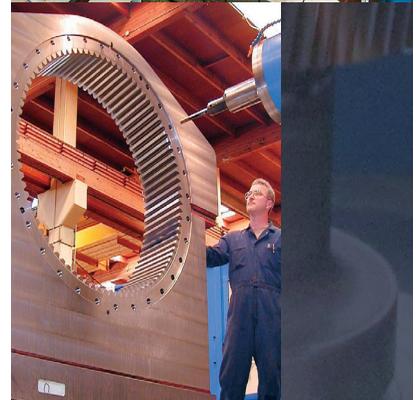
MORE INFO americas.rwe.com

Machinists Inc.

From single parts to complete manufacturing systems

MI cuts gears to 250 inches in diameter and grinds gears to 102 inches in diameter.

MI provides full service gearbox repair & testing for dependable overhaul and enhancement of gear drives.



Call us about your project



800 / 244.4130

www.machinistsinc.com

MACHINISTS INC. ISO 9001 certified



US Wind's floating Lidar buoy uses an eye-safe, continuous wave laser to measure wind speeds and direction across the turbine height. (Courtesy: US Wind)

INNOVATION

US Wind deploys floating Lidar buoy in Maryland lease area

Maryland-based offshore wind developer US Wind, Inc. recently announced the deployment of a meteorological and oceanographic (metocean) buoy to collect wind and marine life data off the coast of Ocean City, Maryland.

Ocean Tech Services, LLC has been engaged to provide turnkey data services from the system, which include construction, testing, deployment, and operations of the buoy and associ-

ated sensors. The Floating Lidar buoy uses an eye-safe, continuous wave laser to measure wind speeds and direction across the turbine height. These measurements, along with surface meteorology and ocean condition observations, will help inform US Wind's energy production estimates and overall project design.

The buoy will also allow US Wind to collect an array of advanced environmental and wildlife data through sensors that enable the monitoring of bats, birds, fish, and other marine mammals to determine the presence, frequency, and distribution within the lease area. Subsets of the metocean observations will be posted publicly on US Wind's website.

"The deployment of our metocean buoy is a critical milestone in our commitment to help meet Maryland's renewable energy goals," said Jeff Grybowski, US Wind CEO. "The data collected will advance our understanding of wind and wildlife patterns in our lease area to inform the most environmentally responsible and efficient design, project layout, and turbine siting."

Cleanly powered by solar panels and wind turbines, along with an on-board fuel cell and battery back-up system, the buoy will be deployed within the lease area for two years.

"Ocean Tech Services is excited to work with US Wind during the site assessment phase of the Maryland wind energy area development," said Stephen O'Malley, president of Ocean Tech Services. "As a locally-based service provider, OTS brings the experience, personnel, and equipment required to successfully complete the offshore data collection campaign."

Baltimore City-based, family owned and operated, Moss Marine USA coordinated all local logistics for the work done at Tradepoint Atlantic, adding another layer of local content to the campaign. Chelsea Moss, founder of Moss Wind USA, a woman-owned Maryland business, served as on-site facilitator.

"I've been a long-time supporter of offshore wind development for several reasons, including the numerous business opportunities it provides to marine contractors like me," said Michael Moss, owner-operator, Moss Marine USA. "We truly appreciate the opportunity to support US Wind on the metocean buoy campaign and look forward to providing assistance with US Wind's efforts to build out their lease area in whatever way possible."

"Having visited Denmark and witnessing the success of offshore wind overseas, I am extremely proud and inspired to be a member of the Lidar project team, helping US Wind gain the information they need to develop the MarWin project," Chelsea Moss said. "This is a very exciting time to be working in offshore wind, especially for small, women- and minori-

ty-owned businesses in Maryland. I look forward to seeing turbines off Maryland's coast upright and turning."

The buoy deployment was staged out of Tradepoint Atlantic, one of the leading offshore wind ports on the east coast, located at Sparrows Point, Maryland. TPA's facilities provided ideal accommodations for the safe and efficient assembly, port-side testing, and load-out of the buoy and associated equipment.

"The deployment of US Wind's Lidar Bouy represents another step forward for offshore wind in Maryland, and further demonstrates that Baltimore and Tradepoint Atlantic continue to be the ideal hub for offshore wind in the Mid-Atlantic," said Russell Williams, director of Offshore Wind Development for Tradepoint Atlantic.

US Wind acquired an 80,000-acre federal lease area off of the coast of Maryland in 2014. In 2017, the company was awarded offshore renewable energy credits (ORECs) from the State of

Maryland for the first phase of its MarWin project. In total, the company's lease area can support approximately 1.5 GW of offshore wind-energy capacity. In 2019, Maryland passed the Clean Energy Jobs Act, which increased the state's offshore wind-energy requirements, calling for an additional 1.2 GW to be procured from developers with projects near the state's coast.

MORE INFO uswindinc.com

INNOVATION

New approach to streamline offshore wind assessment

Leosphere, a Vaisala company that specializes in developing, manufacturing, and servicing turnkey wind Lidar instruments for wind energy, recently announced its new WindCube® Scan

Dual Lidar Ready offering. It enables offshore wind project developers and operators to reduce multiple sources of uncertainty and gain an even more comprehensive picture of wind resource profiles by observing an offshore location from several positions.

"As the utilization of offshore wind energy continues its massive growth in regions around the globe, projects are evolving to include larger turbines, increased heights, and denser installations," said Matthieu Boquet, head of Products, Wind Energy at Leosphere, a Vaisala company. "By simultaneously providing complete, spatial wind data from several strategically selected positions, this new offering supports the offshore evolution by significantly increasing the quantity and dramatically improving the quality of wind data in a cost-efficient way."

Using two WindCube Scan devices on the shore or on offshore platforms, this approach delivers accurate wind mapping with typical ranges up to 10

HANSEN PROTECTION JOINS FORCES WITH SURVITEC



survitec

HANSEN PROTECTION

Visit our website to find out more

survitecgroup.com/hansenprotection

Tractel

- * DeRope Multi-man Emergency Descent Kits Sales and Recertification
- * Climb Assist Sales and Service
- * NEW TracX Wind Harness Sales

Call or email for information
sales@patriotind.com
www.patriotind.com
800-543-2217

PATRIOT
INDUSTRIAL SOLUTIONS

Increase Tower Up-Time and Safety



Two WindCube Scan devices on the shore or on offshore platforms can be used to deliver accurate wind mapping with typical ranges up to 10 kilometers from several positions at once. (Courtesy: Vaisala)

kilometers from several positions at once.

The solution leverages intersecting beams for better coverage and accuracy, reducing vertical and horizontal uncertainty, and enabling fine assessment of turbulence intensity for turbine suitability. The result is a richer understanding of nearshore wind resources, improved reliability, and great campaign cost-effectiveness.

The WindCube Scan Dual Lidar Ready offering delivers the following benefits:

- Reduced uncertainty in the assessment of wind resources.
- Reliable data for difficult-to-assess waterways and sites.
- Cost-efficiency and high operational continuity.
- Easy deployment and operation from shore or on fixed offshore platforms.
- Increased flexibility in the campaign design.
- Precise coordination between Lidar units.

“With its multiple benefits and advanced operational track record, dual scanning Lidar is gaining significant traction in the offshore wind market,” said Bastian Schmidt, team leader, Remote Sensing at DNV. “At DNV, we

are strengthening confidence in supporting such a solution for projects in challenging nearshore and offshore environments due to the technology’s increasing maturity and industry acceptance.”

The WindCube Scan Dual Lidar Ready offering is backed by the most comprehensive and trusted support anywhere. Following the successful completion of several customer offshore wind projects across a variety of situations, the company provides the technical support and guidance customers need in order to prepare and operate dual-Lidar solutions. In addition, the global reach and large network of factories and service centers available ensures customers receive the best service and support available — no matter where in the world they are located.

With more than 15 years of scientific Lidar innovation backed by the best science and metrology — and validated by the most demanding testing and certifications in the industry — WindCube has earned the trust of customers and other industry leaders through thousands of deployments around the globe.

MORE INFO www.windcubelidar.com

INNOVATION

Pexapark launches first renewable PPA pricing tool

Pexapark, a provider of software and advisory services for post-subsidy renewable energy sales, recently announced it has added a new pioneering feature that accounts for site- and technology-specific production to its renewable energy pricing system, PexaQuote. PexaQuote supports developers and investors managing more than 250 GW of global renewable energy investments as the industry pushes further into a subsidy-free future.

The renewable energy PPA market is expected to exceed 10 GW this year, with more than 5.5 GW already signed across 68 deals since the start of 2021. According to Pexapark’s “PPA Times” report, this rapid growth is being driven by the entry of large corporate buyers, which are setting new records for volume of PPAs across Europe.

However, as the market is becoming more mature and offerings more structured, many renewable energy companies must now deal with increased analytics demands to master the complexity of PPAs, and thereby reduce structuring and execution losses amidst heavy competition for limited liquidity. Renewable energy companies have also continued to battle against opacity around price data in the market, limiting their ability to accurately value potential PPAs for new assets. Among others, site- and technology-specific characteristics are key price determinants when assessing the correct market value in any PPA transaction.

PexaQuote is now the first PPA pricing tool to account for and adjust prices in line with all relevant factors such as a given site’s local weather properties and production profile based on type of renewable energy technology in line with the chosen PPA structure.

Users with access to this add-on are able to drop a pin on a European map

and quickly specify all parameters to calculate fair PPA pricing for their specific wind turbine or PV panel. Pricing for a given structure is calculated in under a minute based on the location's meteorological data.

ABO Wind, a leading renewable energy developer, was one of the first locational pricing users.

"Locational pricing is of interest to us from the first stage of project development, because it gives us a really good understanding of what to expect from a potential PPA for a project in a particular location, and helps us work out project sizes and timings," said Ryan Bernhard, head of Energy Sales and Markets, ABO Wind. "It's also helpful when we talk to investors who want to know if a project may be better than the market average. Locational pricing gives us an edge on understanding the value of the location."

"We've seen time and time again how much top-line value can be lost if the PPA is not properly priced," said Luca Pedretti, co-founder and chief operating officer, Pexapark. "With the new locational pricing features of PexaQuote, project developers, investors, and producers can finally analyze all relevant factors for a given project's PPA by themselves."

"Our technology allows them to accurately identify the site-specific, market-based value of renewable electricity production and is a powerful tool for fine-tuning start date, tenor, structure, and contract volumes in PPA negotiations," Pedretti said. "This new feature further supports developers during PPA negotiation off the back of Pexa-

park's award-winning pricing system, PexaQuote."

MORE INFO: pexapark.com

MAINTENANCE

Snap-on's cabinets place most-often-used tools in clear view

Snap-on Industrial's Visual Control Cabinets place frequently used tools in clear view, giving technicians full sight lines of their tools for instant accountability and asset management.

The Visual Control Cabinets, part of Snap-on's Level 5 Tool Control System, use a clear, Makrolon® AR Polycarbonate window for at a glance tool management and security. The full-swing door hinge creates unobstructed entry, while the gas shocks keep the door in the upright position.

The Visual Control Cabinets are available in both keyed or e-Lock keyless access for maximum security without the need to distribute keys; e-Lock that is programmable for up to 3,000 users, and can be networked together with LockView® software. The Visual Control Cabinets can be mounted to walls, workbenches, carts or roll cabs, and are ideal for point-of-use on specific maintenance functions within aviation, power generation, maintenance, and other industrial industries.

For optimal visibility and control, metal peg boards with clearly marked tool locations or foam cutouts are ide-



The Visual Control Cabinets, part of Snap-on's Level 5 Tool Control System, use a clear, Makrolon® AR Polycarbonate window for at a glance tool management and security. (Courtesy: Snap-on Industrial)



HEICO FASTENING SYSTEMS



HEICO-LOCK® COMBI-WASHERS

The improved version of the standard HEICO-LOCK® wedge lock washers

- Quick and easy assembly
- Combine with all commercially available bolts
- Can be supplied as a pre-assembled part - ready made SEMS fastener
- Permanent connection thanks to the inset tabs
- Re-usable

MADE IN GERMANY!



HEICO-TEC® TENSIONING SYSTEMS

The simple, fast and reliable way to tighten large bolted joints!

NEW:
HEICO-TEC®
MULTI-TOOL



HEICO-LOCK

888-822-5661
Hickory, NC
WWW.HEICO-GROUP.COM



BladeInsight is a Portugal-based technology company providing the wind sector with cloud-based O&M asset management software and autonomous drone robotic solutions for wind-turbine blades. (Courtesy: Swire Energy Services)

al for these tool boxes as they allow a technician to quickly scan a tool tray and see if anything is missing.

When mounted to roll cabs or carts, Visual Control Cabinets offer a “Strike Zone” approach, which places tools in a comfortable ergonomic position above the knee and below the shoulders to reduce the need to bend and stretch for tools.

Features and benefits of Visual Control Cabinets include:

- ▀ Keyed Access: 49” wide (L5V5S49); 34” wide (L5V5S34).
- ▀ Keyless Access: 49” wide

(L5VP5S49); 34” wide (L5VP5S34).

- ▀ Tool capacity up to 100 tools.
- ▀ V-stands for flexible mounting options; pre-drilled holes on base for mounting on carts or roll cabs.
- ▀ Interior tool control options include metal peg board or foam (foam layout can be customized to customers’ needs).

▀ Available in red, gloss black, royal blue, ultra-yellow, and arctic silver.

▀ Dual Visual Control Cabinet (L5V5S2X49MCR) available only in red.

MORE INFO b2b.snapon.com

▀ MAINTENANCE

Swire invests in BladeInsight to support renewables

Global energy services provider, Swire Energy Services (SES) recently announced the investment in wind O&M technology start-up, BladeInsight. The deal will see SES obtain a majority shareholding, with options for further future investment.

Founded in 2015 by André Mou-

ra, BladeInsight is a Portugal-based technology company providing the wind sector with cloud-based O&M asset management software and autonomous drone robotic solutions for wind-turbine blades. Through its licensees, BladeInsight services the wind markets in Europe, North America, and South America.

This is the first investment in Swire Energy Services history that will see a stake investment in a technology company exclusively servicing the renewable energy industry. The investment forms part of the long-term strategic development for SES in its growth path into the renewable energy sector.

“This investment marks our first in the wind industry and is testament to the commitment and work by André and his team,” said Sabine Weth, VP Offshore Wind for Swire Energy Services. “We have been incredibly impressed by the technology and are thrilled that the management team shares our vision and strategy for the future development of the company.”

We see this investment as an opportunity to leverage the advanced drone technology and data platform to support the development of specialized and highly cost-efficient services in the offshore wind industry going forward,” Weth said. “As part of our long-term strategy, supported by our parent company John Swire and Sons, technology will form an integral aspect of SES developing a sustainable business that can support our customers through the energy transition and beyond.”

The investment by SES will enable BladeInsight to further develop its software and hardware technology solution to support customers across the wind market. BladeInsight will also benefit from SES global presence across 28 countries, allowing for further geographical expansion.

“With this investment, we establish ourselves on the next level of scale and value delivery for our customers, offering inspections and digitalization solutions to optimize O&M onshore and offshore, with a truly global outlook,” said Andre Moura, CEO and Founder



The Crosby Group's extensive portfolio for the renewables market includes a range of vertical and horizontal lifting clamps. (Courtesy: The Crosby Group)

of Bladeinsight. “We share with SES common values and an ambitious vision for the wind industry, in which technological innovation will play a pivotal role.”

MORE INFO swirees.com

MANUFACTURING

Crosby's lifting clamps can provide safer wind operations

The wind industry is one of the world's most demanding industries with unique challenges for those involved with manufacturing and installing towers, monopiles, and transition

pieces. However, there are common elements with many other end markets: heavy materials to lift from various angles, concern about equipment damage during handling, and a top focus on safe lifting and rigging operations.

As a leading manufacturer of rigging, lifting, and load securement hardware, The Crosby Group works to provide solutions that directly address these concerns of the wind industry. Their extensive portfolio for the renewables market includes a range of vertical and horizontal lifting clamps and pipe hooks specifically designed for the demands of wind-energy applications. A standout special feature of CrosbyIP-branded standard and custom clamps is the availability of minimal-marring camsegments and pivots, the clamping pieces of a clamp.

“When handling steel plates with lifting clamps, the clamping camsegment and pivot usually leave an indentation in the material surface — known as marring,” said Kees Gillesse, product marketing manager at The Crosby Group. “Because of the high standards in the wind-energy industry, these indentations have to be ground away from the surface. This rework costs time and money. By reducing the height of the teeth of the camsegment and pivot, the pitch between the teeth can be decreased and more teeth can be in contact with the material surface, reducing the depth of the indentations.”

CrosbyIP vertical lifting clamps feature welded alloy steel bodies to minimize size but increase strength. Alloy components are forged, where required. The lock open, lock close function has a latch for pretension and release of material. Each product has its own serial number and proof load test (to two times working load limit), date stamped on the body, and user manual with test certificate included with each clamp. Manufactured at an ISO 9001 certified facility, all sizes are also RFID equipped. CrosbyIP is also known for the manufacture of special clamps where there might be a requirement beyond the capabilities of the standard range.

“The Crosby Group develops practical solutions for specific problems,” Gillesse said. “Our mission is to be the innovative and quality leader in the field of lifting clamps by manufacturing products of uncompromising quality and providing solutions for specific lifting situations. If our standard product range may not meet the client’s specific needs, CrosbyIP-branded lifting clamps can offer an extensive range of custom or bespoke options.”

A recent example of custom manufacturing is the 22.5-ton capacity special universal vertical clamp (model IPU10X3). The clamp, which was designed for a German wind-energy manufacturer, features an extra-wide camsegment and three pivots for less surface pressure to further reduce

indentations. A deep jaw, meanwhile, allows for lifting beveled plates and constructions. Lifting brackets make positioning easy when the lifting clamp is in the horizontal position. The universal lifting eye permits lifting from every direction.

Another special product is the 6-ton capacity universal horizontal clamp (model IPHGUX1), which presents many of the same benefits to the end user and is ideal for rolling larger plates. This is a new high-tonnage addition to the universal horizontal lifting clamp range. Finally, the 70-ton capacity pipe hook (model IPPH) has been designed for 5,700 mm to 7,000 mm diameter pipe, up to a thickness of 100 mm. It features soft steel replaceable inserts and is equipped with 40-ton capacity G-2140 shackles. With both the universal horizontal clamp and pipe hook, other capacities and jaw-openings are available on request.

“A common problem is that most of the standard pipe hooks can damage

the pipe surface when lifting,” Gillesse said. “A general solution is to have aluminum inserts to prevent marring of the surface of the pipe. However, with aluminum, there can be contamination with the steel of the pipe, compromising quality of the weld when welding pipe sections together. The replaceable inserts of the CrosbyIP pipe hook are made from soft steel to prevent such contamination and marring.”

With vertical and horizontal lifting clamps and pipe hooks developed and manufactured specifically for key manufacturers of towers, monopiles, and transition pieces, The Crosby Group is eager to help solve problems for the wind industry and contribute to its continued growth.

MORE INFO www.thecrosbygroup.com

MANUFACTURING

Eaton’s filters can handle pressures up to 6,000 psi

Adding to its high-pressure filter range, the Filtration Division of energy-management company Eaton introduces the HP3 series for mobile and industrial applications. Suitable for oils, emulsions, coolants, and most synthetic and lubrication fluids, the filters have a working pressure of up to 6,000 psi (420 bar).

The HP3 series is available in different sizes ranging from HP3 30 to HP3 60, HP3 90, HP3 170, HP3 240, HP3 360, HP3 450, HP3 900 up to HP3 1350, and with flow rates from 8 gpm up to 357 gpm (30 to 1,350 l/min). The cast iron head of the filter provides up to a 30 percent lower pressure drop than previous generations. The flow direction is from outside to inside. Visual or electrical differential pressure (DP) indicators are available as well as reverse and by-pass valves.

“Contaminated fluid causes up to 80 percent of system failures,” said Eric Rud, global product manager at



Eaton’s HP3 series of in-line mounted, high-pressure filters can handle a maximum pressure of 6,000 psi (420 bar). (Courtesy: Eaton)

Eaton's Filtration Division. "The HP3 high pressure in-line mounted filter increases fluid cleanliness and service lifetime, reducing replacement, repair, and disposal costs."

Core part of the HP3 filter is a high resistance version of the 01.E filter element. It is available for filtering down to 5 μm with a differential pressure resistance of 2,320 psi (160 bar). The high resistance 01.E filter element supporting components are designed to be robust and use full-metal instead of plastic.

That is the core tubes are made of welded metal sheet, zinc-plated end caps, and supporting rings. With this type of support, these filter elements are well-suited for high differential pressures that can occur during a cold start. The stability and functionality of the pleat bellow is further improved by a reinforced supporting mesh layer. The high resistance version of 01.E filter element is available in all common filter material options, such as glass fiber fleeces (VG) and stainless steel wire mesh (G).

Eaton filter elements are known for high intrinsic stability, excellent filtration capability, high dirt-holding capacity, and long service life. With these characteristics, the HP3 filter series works best for petroleum-based fluids, water-based emulsions, water glycols, most synthetic fluids, and lubrication fluids.

Eaton's online filtration calculators help select the best filter and determine the filter performance over a specified flow rate and viscosity.

MORE INFO Eaton.com

MANUFACTURING

Gorillabel provides ID, traceability in highly abrasive environments

InfoSight Corporation is dedicated to bringing identification and traceability solutions to every imaginable application. Highly abrasive environments



This Gorillabel™ is 15 mm diameter in a 2 mm deep pocket in a 3.6" OD pipe. (Courtesy: InfoSight)

are tough on components and just as tough on any identification of those components. InfoSight introduces Gorillabel™ to identify components used in highly abrasive environments, such as oil drilling and fracking.

The identification label, which is pre-marked by InfoSight, is a transparent Gorilla® Glass disk. InfoSight recommends countersinking the label into a shallow machined pocket so the surface of the component remains level.

After severe abrasion, wiping the label with a liquid that matches the glass index of refraction restores its clarity.

The label will survive anything the component must survive, including:

- Boilouts — cleaning at or above boiling temperatures (100°C/212°F)

and high pH (12 or above).

- Long-term immersion in temperatures over 300°C (570°F).

- Extended slurry abrasion.

This rugged barcoded label was developed for downhole petroleum drilling component identification. Other potential applications include fracking components, mining components, and bulldozer and backhoe parts.

Data vital to the operation of each component, such as maintenance records and length of service, becomes immediately available to the operator with a simple smart phone scan. This is useful for planning maintenance on equipment and reducing risks to both production and safety. ↵

MORE INFO www.infosight.com



CROSSWINDS

THE FUTURE OF WIND

UNEARTHING RARE EARTHS

The Round Top Project in west Texas has an abundance of rare earths, particularly the heavy rare earths that are seldom found in significant concentrations outside of China. (Courtesy: USA Rare Earth)

A recent report from the IEA warned of the increasing need of rare-earth materials necessary for the production of turbines and other renewable-energy innovations, and USA Rare Earth is moving forward to ensure the U.S. is part of that competition.

By **KENNETH CARTER** ▸ Wind Systems editor

Even though the energy produced by wind turbines is renewable, the sober truth is that much of the materials used to manufacture a turbine is anything but. And as more and bigger turbines will be the norm for multiple offshore and land-based wind farms planned in the U.S., the need to acquire as much of these rare-earth materials will become an even larger necessity in the coming years.

A single industrial-size wind turbine can require as much as three metric tons of copper and permanent magnets composed of rare earths, according to Dan McGroarty, Advisory Board Member with USA Rare Earth LLC, a U.S.-based company developing the Round Top rare earth and critical minerals project in Texas. Of the 17 rare earths, a wind turbine uses about a ton of four of them: neodymium, praseodymium, dysprosium, and terbium. And even more copper is required for grid transmission.

“As you capture the wind, you need the metals and minerals and the elements I’m talking about, and then you’ll need even more as you pull it into the grid and move it,” he said. “And that doesn’t even scratch the surface. There are other smaller amounts of metals and minerals that are required. Then, you have a different set for solar. You have a different set for EV batteries, and varying chemistries for lithium-ion batteries. You have different metals and minerals required for geothermal. At the end of the day, it is a significant swath of the Periodic Table, which are now, as Department of Energy has sometimes called them, energy-critical elements.”

MATERIALS RACE

The need for these energy critical elements is setting off a tech materials race to aid in the transition to renewable energy that might become much more complex than the geopolitical competitions in the oil/natural gas era, according to McGroarty.

“I say far more complex because there are different types of oils — sweet and crude and light and so on — but here you’re really talking about 25 to 30 elements on the periodic table that come into play,” he said. “And every country will be scrambling for them.”

A recent report released by the International Energy Agency stressed the importance of making sure these critical elements will be available for the expected boom in renewable energy and its offshoot technologies.

The report, *The Role of Critical Minerals in Clean Energy Transitions*, is a comprehensive global study on the importance of minerals such as copper, lithium, nickel, cobalt, and rare-earth elements in a secure and rapid transformation of

the global-energy sector. The report recommends areas of action for policy makers to ensure critical minerals enable an accelerated transition to clean energy rather than becoming a bottleneck.

“This is the world that USA Rare Earth lives in,” McGroarty said. “We do understand the targets to make the transition to a renewable economy; we know for a fact that’s going to ratchet up material demand. We know that, and that’s what we’re working toward. We’re working to alleviate that. This report says things like, ‘We’re going to need 10 times as much lithium as is produced in 2020 and 2021.’ If that report is incorrect, and we only need nine times as much, or if it’s wrong and we need 11 or 12 times as much, it’s still an enormous new demand. And the report should be very sobering to everybody who wants to make this transition about what it’s going to take to make it to happen and who will drive it. And by that, I mean, will it be the United States and our fellow industrial democracies, or will we be the buyers of systems made elsewhere?”

CHINESE FORESIGHT

And in the short term, China foresaw years ago that these energy critical elements would be involved in the next energy evolution, according to McGroarty.

“I suppose we would have to credit China with the foresight in seeing the rising requirement for this new group of metals and minerals more quickly, perhaps, than other countries in the world,” he said. “And after all, when you’re thinking about it that way, China as a command economy; it either sees this evolution, or it fails to see it. But in the industrialized democracies, it is only partly the governments that see it or fail to see it. In the industrial democracies’ world, we are dependent on our small and large companies seeing it and acting accordingly. So, it’s very asymmetrical, I would say, in terms of picking up on this.”

Even though China has access to much of the rare earths available at the moment, there are significant deposits in the West outside of China, according to McGroarty.

ROUND TOP, TEXAS

For instance, McGroarty said USA Rare Earth is developing the Round Top Project in west Texas, where there is an abundance of rare earths, particularly the heavy rare earths that are seldom found in significant concentrations outside of China.

“Geologically, it’s very unique in that respect,” he said. “But the other point is that we, as a company, have decided that it is important to pursue this as a supply chain solution. The extraction happens in west Texas from Round Top, but



The key to maximizing the production of rare earths is to know when to recycle, reclaim, or mine new materials outright. (Courtesy: USA Rare Earth)

once the rare earths come out, they then have to be separated, and then processed from a powdered oxide to a metalized form by alloying them with other metals and minerals — and ultimately into permanent magnets,” according to McGroarty, such as those used in EVs or wind turbines.

“But when China controls the manufacture of permanent magnets, then all the wind turbines that we want to transition to are going to be provisioned with Chinese-made permanent magnets,” he said.

In 2020, USA Rare Earth was able to acquire a permanent magnet manufacturing system in North Carolina owned by Hitachi Metals that was forced to shut down in 2015 due to the settlement of a rare earth trade dispute between China and Japan. The company will use this newly purchased system for permanent magnet production using materials obtained from its Round Top Texas location in addition to materials sourced from other US and foreign-based deposits, according to McGroarty.

“We bought that system, the only of its kind in North America, and are now in the process of re-siting and then recommissioning it,” he said. “We’re looking at a supply chain solution.”

RECYCLING AND RECLAMATION

It may be somewhat of an irony that non-renewable material is needed for the creation of renewable energy, but the good

news is multiple sources are available beyond mining rare earths from designated areas. There’s also recycling, possible element substitution, and mine reclamation, according to McGroarty.

“Reclamation is a category that doesn’t occur to people, but the minute you explain it, it kind of makes sense,” he said. “Let’s say there’s a copper mine from a hundred years ago where people mined copper for a long time, but they didn’t realize that, along with the copper, might come other critical minerals and metals. Those weren’t understood or weren’t even needed, and they ended up in a waste pile or the tailings. With reclamation, we’re going back in and cleaning those up and getting the ‘criticals’ that we know of in the year 2021, that we know how to get out. And secondly, we’ll do a better job now getting them out, technologically.”

The key to maximizing the production of rare earths is to know when to recycle, reclaim, or mine new materials outright, according to McGroarty.

“We, as a company, are very attuned to that,” he said. “We’ve done this successful demonstration for the Department of Energy on precisely that. If someone said to you, ‘Let’s do this, but let’s only recycle, let’s not mine.’ We’re going to get a fraction-of-a-fraction-of-a-fraction-of-a-fraction. And as a math problem, you realize you get less and less and less in a world where we need more and

AD INDEX

American Gear Manufacturers Assn (AGMA)	1
ASM International	3
ColdSnap Towers	47
Denso North America	13
Electricity Transformation Canada	49
Elevator Industry Work Preservation Fund	11
Gastops	50
Heico Fasteners, Inc.	39
Machinists Inc.	35
Northrop Grumman	19
NTC Wind Energy	7
Pamco Machine Works	7
Patriot Industrial Supply	37
Stahlwille Tools LLC	47
Survitec Group Limited	37
TORKWORX	2

EXTEND YOUR COMPANY'S REACH

Present your company's message to the wind-energy industry in print and online through Wind Systems magazine. For 10 years, Wind Systems has served as a leading authority on the wind-energy industry. We offer a variety of media to connect you with potential customers. For details, contact:

David Gomez, National Sales Manager

@ dave@windssystemsmag.com

☎ 800-366-2185 ext. 207





RELIABLE IN ALL CONDITIONS.

**MANOSKOP®
730 Quick**

Experience integrated tool solutions for maintaining wind turbines. Experience the »Made in Germany« difference.

 Made in Germany

Tel.: (+1) 262-583-4060 | info@stahlwille-americas.com

MET TOWERS IS WHAT WE DO. IT'S ALL THAT WE DO.

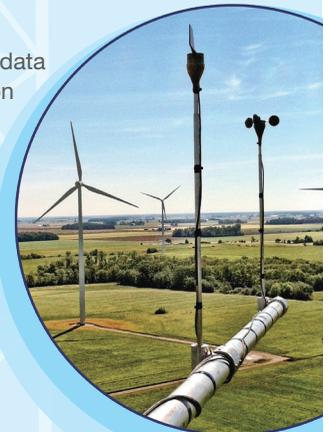
COLDSNAP TOWERS HAS BEEN OPERATING IN THE WIND INDUSTRY FOR 17 YEARS.

WE SPECIALIZE IN MET TOWER MAINTENANCE ON WIND FARMS ACROSS THE U.S.

- Nationwide fleet maintenance
- Quick response for urgent repairs
- Tower commissioning
- FAA obstruction lighting
- Reliable meteorological data
- Thorough documentation
- Troubleshooting
- Risk mitigation
- Safety compliant



FOR MORE INFORMATION
info@coldsnaptowers.com



more and more. So, I say, ‘Yes. Let’s recycle what we can, and let’s reclaim what we can. And then let’s mine primarily what we can.’ And then when we do mine, and we have a polymetallic deposit [at Round Top], let’s get every single metal and mineral out of that and not create new waste piles by being mono-focused on just one thing.”

FACING THE CHALLENGE

These different methods of obtaining rare earths for renewable energy production are the optimal way to face the challenge, according to McGroarty.

“As a country, if we look at things like the IEA report and say, ‘Oh my gosh, we’re going to need massive amounts of this stuff,’ then let’s get it from our old cell phones or laptops; let’s get it from new mines; let’s get it from old mines’ waste piles,” he said. “I had a conversation very early on with one of our senior people who is working with USA Rare Earth, and I said, ‘so we separate out the rare earths from the waste stream....’ And he cut me off and immediately corrected me: ‘That is not a waste stream; that is a work stream. The minute the rare earths come out of it, it’s a work stream for the lithium that we’re going to get out of it, and the gallium and the other criticals.’ He was very bothered that I called it a waste stream. He said, ‘That’s the kind of thinking we can’t afford anymore.’”

HISTORY OF LEADERSHIP

The U.S. was a world leader in rare-earth production more than 30 years ago, and, for a variety of reasons, that advantage waned, according to McGroarty.

“That happened at the worst possible time, because it was just years before the miniaturization of computing and all of the other applications that have since developed,” he said. “And around 1992, Deng Xiaoping said, ‘The Middle East has oil. China has rare earths.’ And at that moment in time, nobody knew what the man was talking about. But the U.S. was exiting the market. That makes it sound like the U.S. made that choice to exit a market, but it just allowed it to happen. And the Chinese focused on it. And China called these new materials, this whole group, they don’t use the phrase, critical minerals, they call them new materials. And I think that’s interesting because they’re metals and minerals, but the Chinese see them as materials. They see them as inputs into the technology manufacturing supply chain.”

INDUSTRIALIZED DEMOCRACIES TAKING POINT

Even though the current situation in China gives that country many advantages with critical minerals, that does not mean there is no potential in the U.S., Canada, Australia, and other industrialized democracies, according to McGroarty.

“The IEA report says this transition to zero carbon will turbocharge the competition for critical minerals, so the question is going to be whether the U.S. and other industrial democracies are going to be able to move from more of a standing start to get back into these spaces,” he said. “And



USA Rare Earth LLC is a U.S.-based company developing the Round Top rare earth and critical minerals project in Texas. (Courtesy: USA Rare Earth)

sometimes, depending on the metal or mineral, the rare earths getting more and more attention are the core of the materials that USA Rare Earth is developing in its project in Southwest Texas at Round Top.”

Sourcing rare earth materials, whether that be through new mines, recycling, or reclamation, is just part of USA Rare Earth’s mission to become a solution to keep from having to depend on China and other countries for the United States’ rare-earth needs, according to McGroarty.

“(With reclamation), you’re going to get to a point where it is waste, but before you do that, you can use innovation and all of the advantages that American enterprise brings to these efforts to get every last element out that we can, so that we don’t have this dependency,” he said. “Long-term, I’m hopeful, and obviously USA Rare Earth is working to be a positive part of the supply chain solution, but near term, we have as a country, a very serious issue. Because all the things we want to do — excel in manufacturing, make the transition to a carbon net-zero economy, take care of the health of the planet, provide jobs for people who live in this country — it’s going to be really hard to do that if we don’t have the materials out of which the solutions and the answers have to be made.”

FEEDING THE PHYSICAL SYSTEM

Ultimately getting power from wind requires a physical system: What is it? Who makes it? What metals and minerals is it comprised of? That means, according to McGroarty, moving beyond technology from the 1950s, ’60s, and ’70s. The IEA was founded in the wake of the oil crisis of 1974 to figure out how to deal with an oil embargo, and now it’s warning the world about critical minerals.

“Yes, the power of the sun and the wind is inexhaustible. But to capture that energy, to make it usable, we have to pull it into storable forms and move it through a physical grid to the people who need it when they need it,” he said. “And that is the material-intensive part. But, for the first time maybe in human history, we’re marrying innovation and ingenuity to these renewable and endless and non-damaging sources of energy. We’re not burning something. It is the sun; it is the wind. As long as we have a supply of the metals and minerals to create the systems, we can harness that energy and deliver it.”



Electricity
Transformation
Canada

The business of energy, transformed.

November 17–19, 2021

Metro Toronto Convention Centre | Toronto, Ontario



Discover.

New ideas and innovative energy technology.



Connect.

With energy leaders, professionals and policymakers.



Experience.

An energy event like no other.

Join us this Fall!
electricitytransformation.ca

Organized by



Canadian Renewable
Energy Association
WIND. SOLAR. STORAGE.

Association canadienne
de l'énergie renouvelable
ÉOLIEN. SOLAIRE. STOCKAGE.

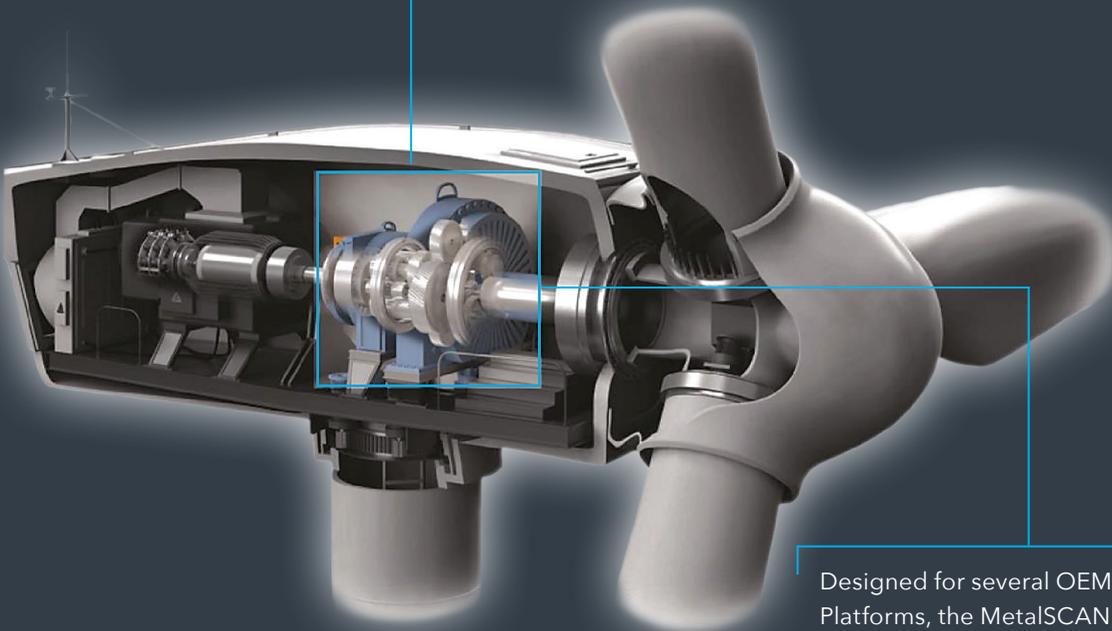


Deutsche Messe

METALSCAN FOR WIND TURBINES



Condition monitoring
technology reliable enough
for the F-35 available for
your wind turbines.



Designed for several OEM Turbine
Platforms, the MetalSCAN oil debris
monitoring system consists of a single
sensor installed into the gearbox oil
lubricating system before the filter.

Reduce operating costs of wind energy
production with critical component
intelligence. MetalSCAN technology
empowers wind turbine operators to
effectively manage gearbox health
issues using oil debris monitoring.

gastops