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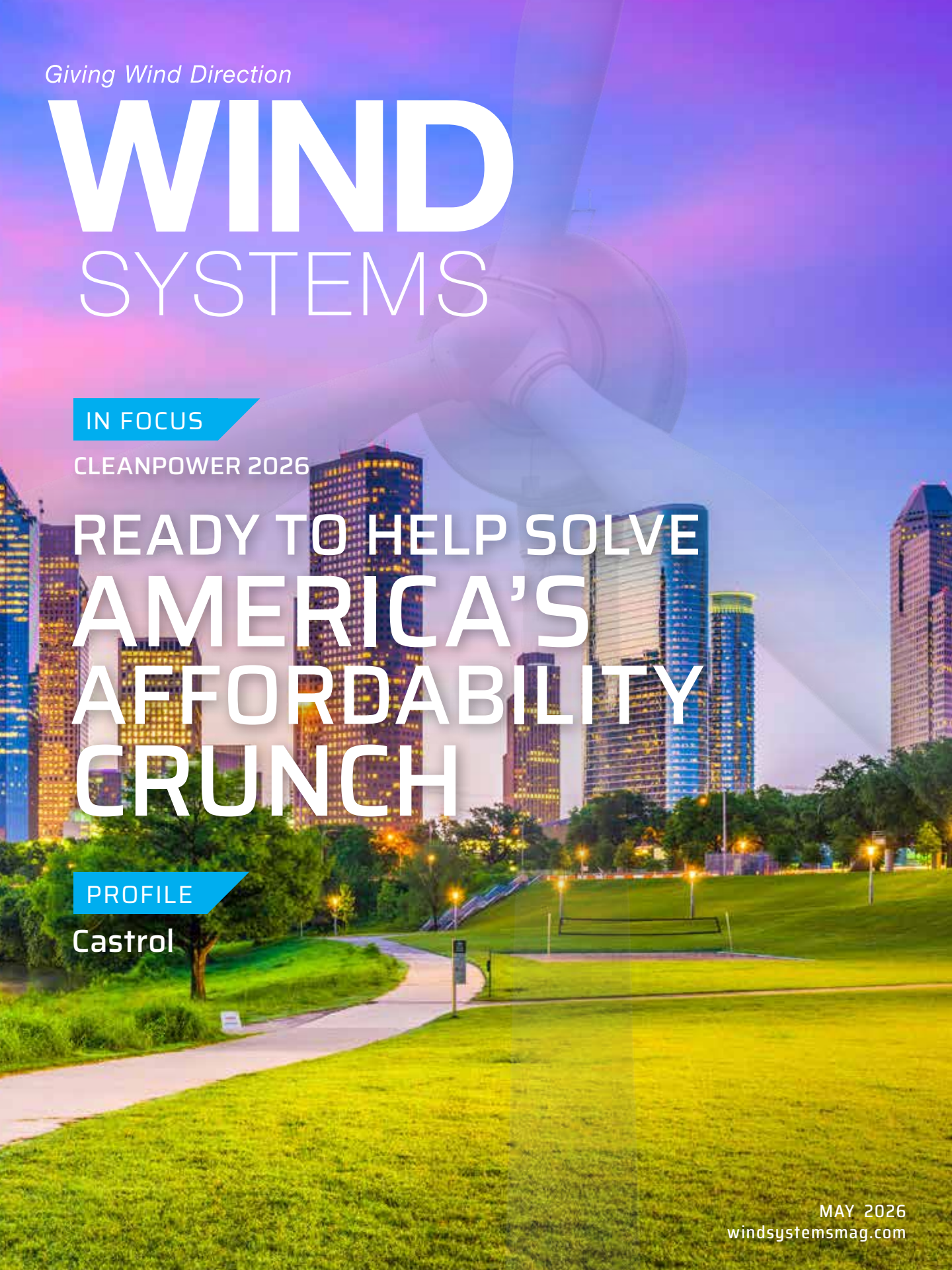

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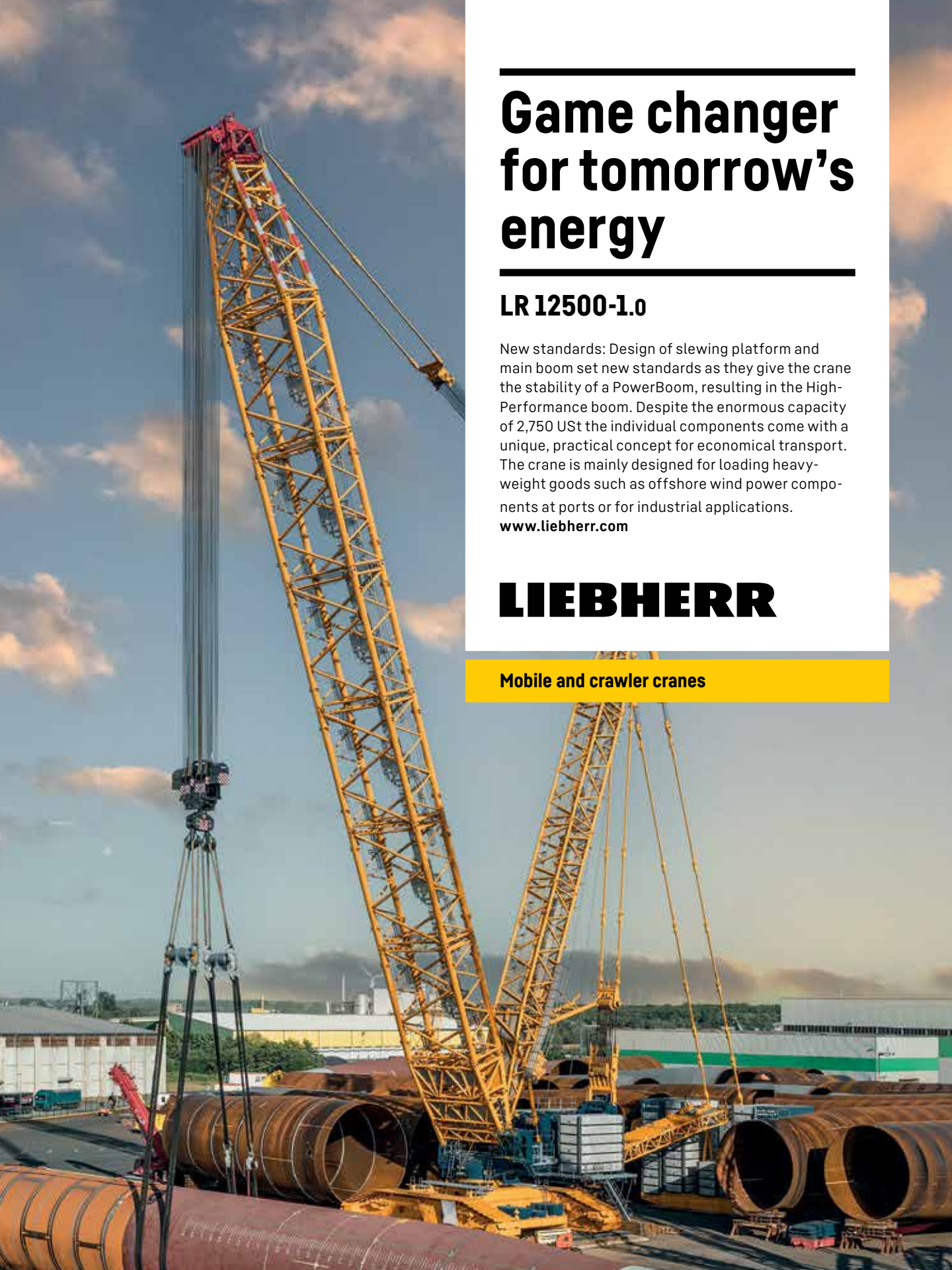

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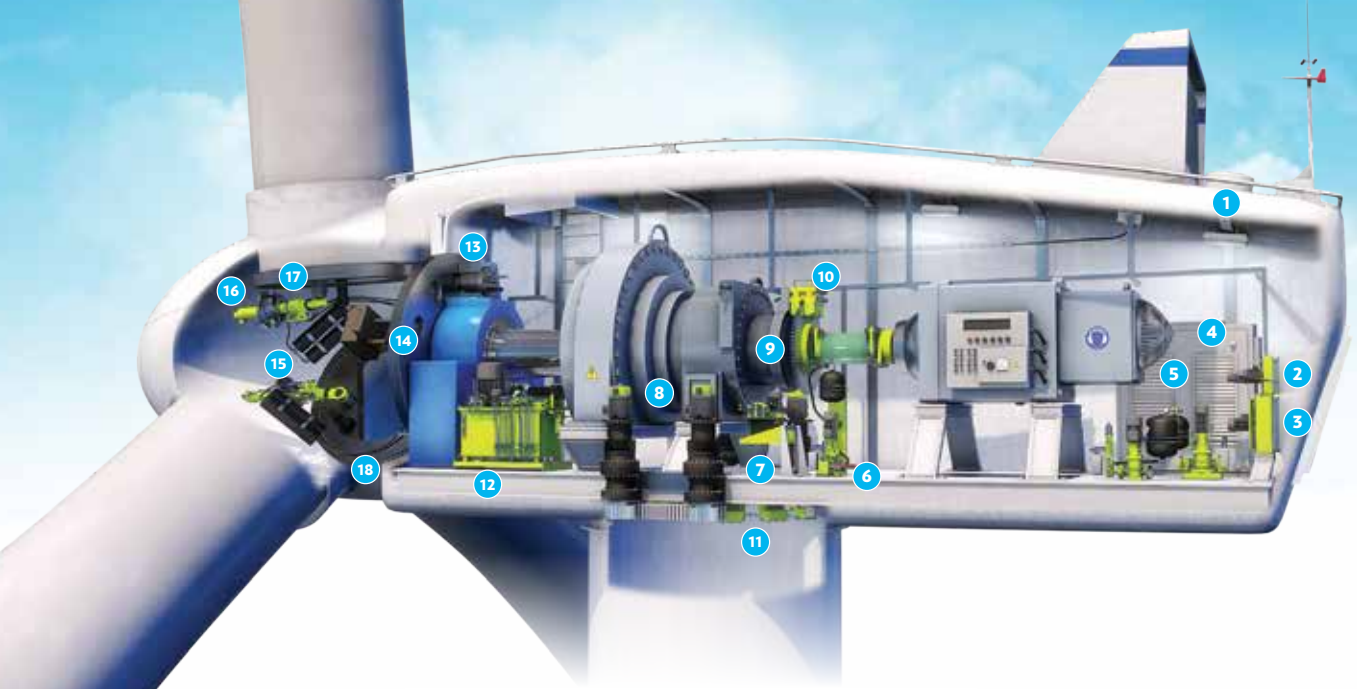

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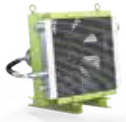

3 ACTIVE WATER COOLER

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6 PUMP UNIT FOR GEARBOX COOLING

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10 ROTOR BRAKE (ACTIVE & PASSIVE)

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12 PITCH SYSTEM (HPU) HYDRAULIC POWER UNIT

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14 DISTRIBUTOR MANIFOLD

15 ACCUMULATOR ASSEMBLY

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Powering up for CLEANPOWER 2026

The spotlight is definitely on Houston, June 1-4, as the premier renewables trade show returns to the Texas city for CLEANPOWER 2026.

A few years ago, the wind, solar, and energy storage industries merged to form American Clean Power, so this year's show will continue to bring together many diverse companies under one roof to highlight the amazing expertise that makes up the many facets of renewable energy.

An incredible amount of planning and coordination goes into this annual event, and the 2026 show has a lot in store for attendees and exhibitors alike.

In last month's issue, we talked with Andrias White Murdaugh, ACP's vice president of conferences and events, on what attendees will get out of this year's show.

Murdaugh called CLEANPOWER the Goldilocks of energy shows, and this year about 9,000 attendees and more than 500 exhibitors are expected.

CLEANPOWER is expanding its networking programs for women, veterans, emerging leaders, and CLEANPOWER in Color. Through these programs, APC is hoping to help facilitate deeper, lasting relationships across the industry to help people — and businesses — grow.

Even though several sectors of the renewable-energy industry will be represented, there still will be a lot of specific focus on wind.

And as a primer for the show, our May inFocus topic shines a spotlight on the wind part of CLEANPOWER 2026. Make sure and check out our cover article by Kelsey Hallahan, senior director, market intelligence at ACP, where she gives her insights on the state of wind in the U.S.

And like last year, with CLEANPOWER in mind, this issue includes a bonus. With CLEANPOWER being made up of many renewable-energy sectors, shuffling through the wind-only exhibitors might be a challenge.

To help with that, inside you'll find a list of all the wind-only exhibitors and their booth numbers. And, if the company is part of *Wind System*'s online community, we've added those companies' wind expertise, website address, and a phone number contact.

I am excited about renewing industry relationships in Houston, as well as meeting some new industry insiders and experts as I walk a few miles each day on the show floor.

To that end, I hope to make it by your booth to say hi. I am looking forward to getting the chance to meet all of you at the show and discuss opportunities for editorial content to share with our readers.

As always, thanks for reading!

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Teresa Cooper
President

Virginia governor signs energy storage bill

From American Clean Power

Virginia Gov. Abigail Spanberger recently signed into law House Bill 895 and Senate Bill 448, a bipartisan measure to reduce energy price volatility, strengthen grid reliability, and accelerate the state's ongoing transition to American-made clean energy.

At a time of rapidly growing electricity demand and increasing system costs nationally, House Bill 895 and Senate Bill 448 represent a milestone for state-level grid and energy storage policies in the country.

The law provides a durable framework for Virginia and a model for other states on how to deploy proven grid solutions that enhance reliability and reduce price volatility for Virginia consumers.

"Energy storage is one of the most effective tools Virginia can deploy to keep electricity affordable and reliable today and into the future," said ACP Chief Advocacy Officer Frank Macchiarola.

Gov. Spanberger listed House Bill 895 and Senate Bill 448 as one of her priority bills at the beginning of Virginia's legislative session, recognizing the importance of deploying energy storage to lower peak prices for ratepayers.

House Bill 895 and Senate Bill 448 authorize a state-level energy storage capacity target of 4,000 MW by 2030 and set a nation-leading goal of 16,000 MW of short-duration energy storage capacity by 2045; the bills also create new opportunities to bolster long-duration energy-storage developments.

Virginia ranks among the top 5 states for projects in the pipeline, according to ACP's 2025 Q4 Market Report. With House Bill 895 and Senate Bill 448, the Commonwealth aims to create new energy-sector jobs, strengthen manufacturing supply chains, and ensure stable, reliable power for the state's growing economy.

A recent ACP analysis found the average Virginian will spend an additional $5,200 over the next 10 years if no new clean power is built.

Energy storage development can alleviate one of the most persistent challenges in our power system: electricity supply and demand do not always align.

AMERICAN CLEAN POWER

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

DIRECTION

THE FUTURE OF WIND

In 2025, KK Group launched a new strategy, Powering Change, and rebranded from KK Wind Solutions to KK Group. (Courtesy: KK Group)

KK Group delivers solid financial results with rebranding strategy during 2025

2025 was a solid year for KK Group. Amid a market challenged by geopolitical and macroeconomic forces, the company increased revenue while also significantly improving overall profitability and free cash flow.

At the same time, the company completed the integration of Vestas' converter and controls business and prepared to finalize the integration of Nissens Cooling Solutions.

"In 2025, during a year of economic uncertainty, we achieved solid financial results while transforming our business to prepare for future growth. We exceeded expectations for both our top and bottom-lines, while maintaining high focus on quality, reliability, and most importantly, safety," said Mauricio Quintana, CEO of KK Group.

In 2025, the company launched a new strategy, Powering Change, and rebranded from KK Wind Solutions to KK Group. The strategy sets the company on a journey to become a more resilient, diversified, and global technology partner for renewables and energy-intensive industries.

As part of the new strategy, the company will accelerate investment to solidify its customer value proposition and to explore new opportunities within its core wind business, repurpose existing wind products in other industries to expand its role across the energy transition value chain.

The company transformed its organization to work more efficiently, drive scale, and to better serve its customers by establishing three business divisions: Power & Controls, Cooling, and Monitoring & Service, supported by group functions.

"Changing our name to KK Group respects our history while incorporating our acquisitions that have complemented our portfolio and enabled us to provide even more value for our key customers," Quintana said. "Our 3,700 colleagues deliver solutions that ensure stable and efficient energy systems in wind and other energy-intensive industries. As electrification accelerates, we help customers improve efficiency and optimize asset performance. Combined with our 2025 results and new structure, we are aiming to become a more diversified and resilient business, well positioned to deliver on our long-term ambitions."

MORE INFO www.kkgroup.com

Boralex acquires 2 wind projects to expand U.K. portfolio

Renewable energy developer Boralex has acquired two onshore wind projects in the U.K., strengthening its development pipeline and supporting the expansion of renewable power generation across Wales and Scotland.

Renewable energy developer Boralex has acquired two onshore wind projects in the U.K. (Courtesy: Boralex)

The projects, Upper Ogmore Wind Farm in South Wales and the Tom na Clach Extension in the Scottish Highlands, have a combined capacity of more than 58 MW and are expected to become operational toward the end of the decade.

The Upper Ogmore Wind Farm, near Blaengarw and Nant-y-Moel in South Wales, is a seven-turbine development with a capacity of about 25 MW. Consented by the Welsh government in 2022, the project was originally developed by RES and later acquired by Marubeni. Once operational, it is expected to generate enough renewable electricity to power about 16,500 homes.

Boralex will now progress development, which secured a 20-year Contract for Difference in AR7, which provides long-term revenue visibility.

The company has also acquired a 75 percent majority share in the Tom na Clach Extension, a 34-MW ready-to-build project northeast of Tomatin in the Scottish Highlands. The project, consented in May 2024, will comprise seven turbines and extend the existing Tom na Clach Wind Farm, which is already operational in the area. The extension was developed by Infinergy,

with Colin Cawdor retaining a minority stake in the project.

Construction of the projects is expected to support local economic activity and provide long-term community benefit funding in surrounding areas. Upper Ogmore is anticipated to bring significant investment during construction and the early years of operation, while the extension at Tom na Clach will build on the established presence of wind generation in the Strathdearn area.

"The acquisition of Upper Ogmore and the Tom na Clach Extension strengthens our development portfolio in the U.K., and reflects our commitment to delivering high-quality renewable energy projects that support the transition to a low-carbon energy system," said Esbjorn Wilmar, U.K. director at Boralex. "Both projects are located in areas with strong wind resources and established grid infrastructure. By progressing these developments, we can help deliver reliable and affordable clean energy while creating economic opportunities for local communities."

The Upper Ogmore project is expected to connect to the grid later in the decade, with grid connection planned for 2029, while the Tom na Clach Extension is targeting commercial operation about 2030, subject to final development milestones.

Together, the acquisitions support Boralex's strategy to expand its renewable energy footprint in the UK and help deliver the clean power capacity needed to meet national decarbonisation goals.

MORE INFO www.boralex.com

Energi Coast welcomes next phase of offshore leasing

NOF and Energi Coast, North East England's offshore wind cluster, has welcomed the Crown Estate's announcement that it will move forward with the next phase of offshore leasing. The announcement was made at the Energy Central Learning Hub in Blyth on March 26 at an event attended by local industry and national stakeholders.

North East England's offshore wind cluster is moving forward with the next phase of offshore leasing. (Courtesy: Energi Coast)

The area identified by The Crown Estate could support up to 6 GW or more of offshore wind capacity, supporting 2030 clean power targets. The announcement also signals a strong step toward strengthening a credible pipeline of opportunities, limiting the impacts of attrition and supporting energy security at a key time.

The region's potential to support future leasing is bolstered by its strategic location, with access to ports, infrastructure through supply chain capacity, and a ready workforce skilled in construction, fabrication, operations and maintenance -- all of which have been at the forefront of Energi Coast's ambitions to highlight the North East's offshore potential.

Established in 2011, Energi Coast is one of eight U.K. offshore wind clusters and is owned and operated by NOF; a national business development organization with more than 400 members involved in the offshore wind, hydrogen, carbon capture & storage, oil & gas, and nuclear industries.

Over the course of three years, Energi Coast has undertaken numerous activities to raise awareness of the opportunity, supply, and technology innovation in the region and has developed key strategic relationships with national stakeholders, as well as, more recently, assisting in the development of a pan-regional offshore wind strategy for the coming decade.

"This is a significant moment for both the U.K. and the North East, placing the region at the heart of delivering energy security whilst simultaneously delivering economic growth," said Tony Quinn, Energi Coast chairman. "The deliverability is borne out of incremental innovation, our engineering expertise and our ability to scale our key businesses to the requisite capacity. We've already demonstrated our capability on projects like Dogger Bank and Sofia and are ready to increase our regional share of this new capacity announced today."

"These new offshore wind farm sites will drive multi-billion-pound private sector investment and create thousands of skilled jobs with regional businesses lined up to capitalize on the future supply chain opportunities," said Joanne Leng MBE, Chief Executive of NOF.

"Today's announcement has the potential to unlock the next phase for North East England's offshore wind future," said Tom Nightingale, Energi Coast deputy chairman and Equinor local supply chain manager. "The re-

Oceantic Network offered praise for offshore wind projects Revolution Wind and Vineyard Wind 1. (Courtesy: Revolution Wind)

gion has grown both expertise and innovation, and further collaboration will grow the industry further for generations to come."

North East England is at the epicenter of the energy transition with the pipeline, projects, and people needed to advance the U.K.'s Net Zero ambitions. The region is built on a great industrial heritage, and its strong supply chain and ports will be at the heart of the sector's growth in the North East and beyond, helping to deliver the Offshore Wind Industrial Growth Plan and create opportunities for local people to prosper.

MORE INFO energicoast.co.uk

Vineyard Wind construction done, Revolution online

The U.S. offshore wind market reached two milestones with announcements that the nearly complete Revolution Wind project has begun delivering power to the grid and the Vineyard Wind 1 project had installed its final turbine.

This marks an advancement for the U.S. market that now has a single, fully operational commercial-scale wind farm. Alongside Vineyard Wind 1, five other projects had been under simultaneous installation, with a total combined generation potential of 5,825 MW, supported by a 40-state supply chain that both projects helped develop through substantial local content investments. Oceantic Network released the following statement:

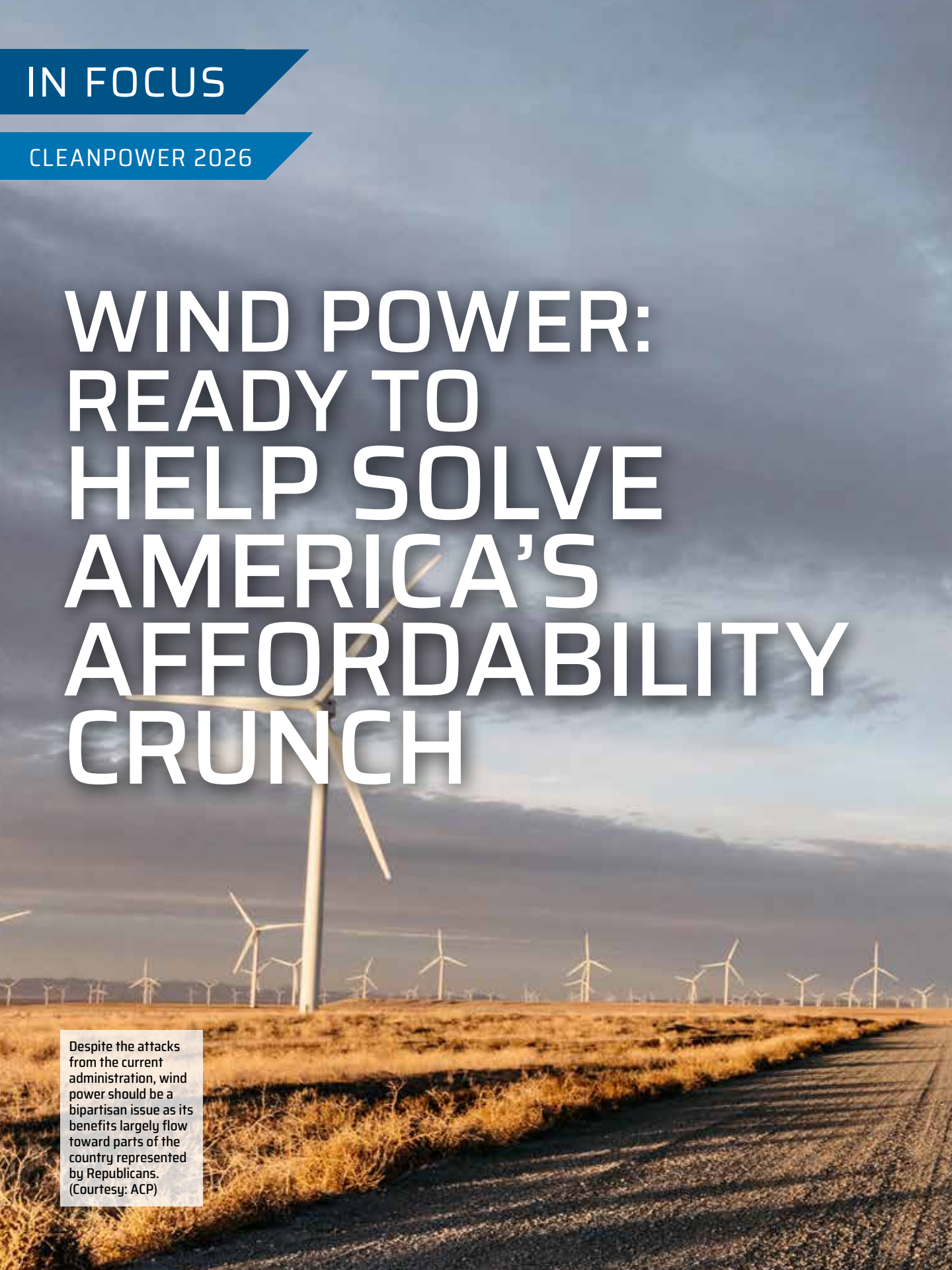
"U.S. offshore wind powers forward. With the third U.S. project now delivering desperately-needed electricity to the grid — and lowering winter energy bills for millions of Americans — the domestic offshore wind industry is demonstrating its true potential every day.

The burgeoning, 40-state supply chain supported installation across five different projects simultaneously — a feat rivaled by few other markets — while creating more than 12,000 jobs and driving $25 billion of American investments flowing directly into our shipyards, ports, and manufacturing centers.

Together, these milestones underscore that offshore wind is not a future promise, but a proven, homegrown energy resource delivering real reliability, affordability, and economic benefits today."

MORE INFO www.oceantic.org

WIND POWER: READY TO HELP SOLVE AMERICA'S AFFORDABILITY CRUNCH



Despite the attacks from the current administration, wind power should be a bipartisan issue as its benefits largely flow toward parts of the country represented by Republicans. (Courtesy: ACP)

Wind power projects bring much-needed electricity and community investment at a time of rising demand and higher bills for everyday Americans, but federal obstruction threatens to keep wind from being part of the solution.

By KELSEY HALLAHAN

The U.S. wind industry stands ready to help keep a lid on rising power bills — if the industry is allowed to operate with less federal interference. By introducing new obstacles to an already-lengthy permitting process, the current administration has repeatedly attempted to throttle one of America's best bets to build more power capacity at scale and at speed.

From directives requiring the Secretary of the Interior to sign off on all DOI authorizations, to the Pentagon mitigation agreements — and the resulting FAA determinations required

The U.S. land-based wind industry contributed more than $40 billion to the U.S. economy in 2025. (Courtesy: ACP)

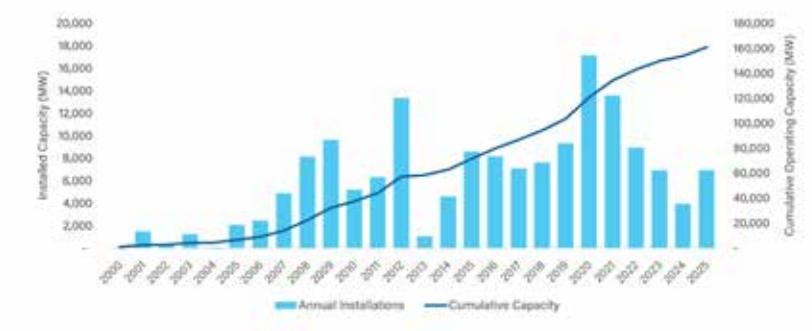


Figure 1: U.S. annual and cumulative land-based wind capacity growth. (Courtesy: ACP)

for wind projects — coming to a complete standstill, federal agencies have not just threatened but effectively ground wind development to a halt across the board over the past year and a half. Because all wind projects require some level of federal involvement, these actions — just two examples among many — have jeopardized not just wind projects on state lands but also private land. For offshore wind, agencies have gone further — targeting already authorized, under-construction projects by suspending or attempting to revoke existing authorizations.

At a time when the U.S. needs to add power capacity to the grid, not get in the way of it, this federal interference has inflicted real harm, both to the wind industry and to the country's wallets. The offshore wind pipeline dropped 23 percent year-over-year, with no new projects commissioned, and the land-based wind industry saw just 7 GW of new projects in 2025, a noticeable recovery from the 10-year low seen in 2024, but still the third-smallest year for deployments in a decade. (See Figure 1)

Despite these headwinds for new projects, existing U.S. wind projects continue to play a critical role in the country's electricity mix. With 160 GW of capacity installed, onshore and offshore wind generate more than 10 percent of U.S. electricity. Offshore wind capacity could increase as much as 20 times in 2026, providing essential grid reliability for the U.S. Northeast.

RISING PRICES

U.S. wholesale power prices surged 41 percent to average $43/MWh in 2025, amid extreme weather events and higher natural gas prices. Wind is one of the cheapest options for

new power available, as well as one of the fastest technologies to commission after construction is allowed to begin. Once in operation, wind projects do not require the same costly and variably priced inputs that thermal generation needs.

Regions with higher concentrations of wind generation felt the wholesale price increase the least: Southwest Power Pool (SPP), home to nearly one-third of the country's land-based wind capacity, maintained the lowest average wholesale prices at $27/MWh, according to data published by the grid operator. Similarly, the Electric Reliability Council of Texas (ERCOT), saw an annual hourly wholesale price increase of 21 percent, half the national average. Texas has long been the national leader in land-based wind deployments, with 44 GW installed.

As energy prices increasingly become a kitchen table issue, wind power is not only delivering relief to the areas where it is installed, but also contributing to the country's GDP, providing well-paying jobs, and supporting rural communities:

- **Investing in America:** ACP's Annual Clean Power Market Report (out April 28, 2026) pegs 2025 investment in new wind projects at $14 billion — capital that shows up as steel in the ground, manufacturing orders, and paychecks. Texas alone accounted for $3.4 billion of that spending, a reminder that today's clean-power build is as much an economic-development story as it is an electrons story.

The U.S. land-based wind industry contributed more than $40 billion to the U.S. economy in 2025, through construction and operations & maintenance activity. This is more than the annual GDP of 90 countries.

- **Supporting rural communities:** For counties and towns that host projects, the benefits often show up in tangible community investment. Wind projects contribute roughly $1.4 billion each year in state and local tax revenue — money that can help fund schools, first responders, and other essential public services.

Landowners, meanwhile, receive an estimated $1.3 billion annually in land lease payments, providing steadier income streams and helping families hold onto working land.

- **The jobs behind the megawatts:** ACP estimates the U.S. wind industry directly employs more than 100,000 Americans, while its broader economic activity supports an additional 280,000 jobs nationwide. These are high-paying jobs that families can rely on, and that communities are built around. Workers directly employed in the wind industry earn $78,942 on average, higher than the mean wage of all private industries and government workers ($67,920) [1].

The ripple effects are measurable: Each job in clean power supports additional employment across the economy, providing about 2.8 jobs in land-based wind and 2.4 in offshore wind.

A RED-AND-BLUE BUILD-OUT

Despite the attacks from the current administration, wind power should be a bipartisan issue as its benefits — to electric bills, to landowners, to rural municipal budgets — largely flow toward parts of the country represented by Republicans. The top 10 congressional districts for operational wind capacity are all represented by Republicans.

Landowners receive an estimated $1.3 billion annually in land lease payments for wind turbines, providing steadier income streams and helping families hold onto working land. (Courtesy: ACP)

As electricity demand continues to grow, the wind industry delivers affordable, reliable energy while driving investment, supporting American jobs, and strengthening communities across the country.

The federal government should get out of the way and let America build the power projects it needs to thrive.

Join ACP and other industry leaders at CLEANPOWER – ACP's largest event of the year where it will be charting the U.S. energy future with top companies, experts, policymakers, and leaders across all types of energy.

The conference is packed with cutting-edge discussions about wind, dealmaking, networking, and fun. CLEANPOWER 2026 will be at the George R. Brown Convention Center in Houston, Texas, June 1-4.

ABOUT THE AUTHOR

Kelsey Hallahan is Senior Director, Market Intelligence at the American Clean Power Association. The American Clean Power Association (ACP) is the leading voice of today's clean energy industry, representing utility-scale energy storage, wind, solar, and transmission companies. ACP is committed to meeting America's energy and national security goals and building our economy with fast-growing, low-cost, and reliable domestic power. More info: cleanpower.org.

REFERENCES

[1] Bureau of Labor Statistics, Occupational Employment and Wage Statistics, May 2024.

PLANNING YOUR CLEANPOWER 2026 EXPERIENCE

A list of wind-related businesses exhibiting at the premier clean-energy trade show.

With CLEANPOWER 2026 focusing on wind energy, solar energy, and battery storage, looking for wind-only or wind-hybrid businesses might be challenging.

To help with your show decisions, *Wind Systems* offers this list of wind-related businesses exhibiting at the show along with their booth numbers.

The highlighted companies are part of the *Wind Systems* community, our online resource for locating products and services that are exclusive to the wind-energy industry. These companies also have their wind-focused expertise and contact information included here.

If you'd like to be a part of our community section and have your company highlighted in next year's issues of CLEANPOWER coverage, contact Ben Keaten at ben@windsystemsmag.com.

For any late booth additions or changes, please refer to the floorplan at cleanpower.org/expo.

3S Lift
Booth #: 1927

ABS Wind
Booth #: 2111

AC883 Nordic Trade Services
Booth #: 2935

Aegis Onshore, Inc
Booth #: 3427

Aerones
Booth #2233

Alimak Group Denmark A/S
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Altair Energy Services
Booth #: 2027

American Clean Power
Booth #: 2027

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Applied High Voltage
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Arup US Inc.
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Ascend Analytics
Booth #: 1203

Aurora Energy Services
Booth #: 1438

Axial Energy
Booth #: 1132

Bachmann Electronic GmbH
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CJR Renewables
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Clobotics A/S
Booth #: 2923

Composites One
Booth #: 2748

ConverterTec USA
Booth #: 3928

Cooper & Turner Industries, Inc.
Booth #: 1427

Dakota Riggers & Tool
Booth #: 2633

Danish Wind Power Academy
Booth #: 3027

Dellner Bubenzer
Booth #: 1647

DESCH North America
Booth #: 3136

Destructable
Booth #: 1839

DeTect, Inc.
Booth #: 2541

Diamond WTG Engineering & Services
Booth #: 2639

Electrical Consultants, Inc.
Booth #: 2124

EMA Electromechanics LLC
Booth #: 3939

Emerson
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ENSA North America
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Epcon Partners
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Epsilon Associates, Inc.
Booth #: 2219

Exus Renewables North America
Booth #: 3827

Firetrace International
Booth #: 1309
Fire protection solutions in the wind industry.
www.firetrace.com

Forte Wind LLC
Booth #: 4225

Free Breeze Energy Systems
Booth #: 3332

FT Wind Sensors (FT Technologies)
Booth #: 1636

Fulcrum3D
Booth #: 1946

GE Vernova
Booth #: 2501

GME Supply
Booth #: 4053

Gulf Wind Technology
Booth #: 3933

Hailo Wind Systems USA
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Hanes Supply, Inc.
Booth #: 1408

Heico Fastening Solutions
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828-261-0184
www.heico-lock.us

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Hubbell Renewables
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Innovative Trenching USA
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Integrated Power Services
Booth #: 2401

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Booth #: 3136
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49 291 9962555
www.ith.com

J&J Energy Solutions
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KK Group
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Liftra ApS
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LiftWerx
Booth #: 2655

Magnum Piering
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Malloy Wind
Booth #: 2739
Wind bearing distributor.
605-336-3693
www.malloywind.com

MaxxForce
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Mersen USA PTT Corp
Booth #: 1827
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www.mersen.us

MISTRAS Group
Booth #: 2207
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609-716-4000
www.mistrasgroup.com

Muehlhan Wind Service
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Natural Power
Booth #: 2511

NIBE Element Wind Solutions
Booth #: 2918

NGC Renewables/ Nanjing High Speed Gear Manufacturing Co.
Booth #: 1619

Nordic Wind Technology
Booth #: 2928

North Coast Enterprise Partners
Booth #: 3439

Olsson
Booth #: 1639

Onyx Insight
Booth #: 3311

Ostermark Basecon
Booth #: 2930

Percheron LLC
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Phazebreak Coatings, Inc.
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Point Lighting Corporation
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Power Climber Wind
Booth #: 2119

Prime Composite Solutions
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Remtech S.A.
Booth #: 2125
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303-772-6825
www.remtechinc.com

Renewable Concepts (Babcock Power)
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RIT Safety Solutions
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RNWBL
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Run Energy LP
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Sendero Energy Services
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Industrial lubricants and oils.
www.shell.us/wind

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Spares in Motion
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Sphere Renewables
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System One
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www.williamsform.com

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Windtest north-america, inc.
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Zephyr Wind Services
Booth #: 1933

ZF Wind Power
Booth #: 3333

PROFILE

CASTROL

PROVIDING ADVANCED ASSET PROTECTION

As a global organization, Castrol has teams all over the world with expertise in dealing with a variety of different environments. (Courtesy: Castrol)

For more than 40 years, Castrol's range of advanced lubricants for wind turbines has helped improve productivity and reduce overall costs.

By KENNETH CARTER ◤ Wind Systems editor

Let's start with the obvious: Today's wind turbines are enormous. Keeping them turning and creating power throughout their lifetime can sometimes be a bit more … complicated.

There are many checks and balances and necessary equipment needed to perform that complex task, but nothing may be more essential than the lubricants within the turbine itself.

To that end, Castrol has been creating lubricants for wind turbines since the early 1980s, according to David DiNunzio, Wind Key Account manager, North America.

EXPANDING ITS WIND KNOWLEDGE

In 2000, Castrol was acquired by BP as the company began to expand its presence in alternative energy, including wind. These investments focused on building and operating wind farms, especially in the United States, according to DiNunzio.

"That gave us some really unique insight into the wind business," he said. "Today, it continues to give us a unique opportunity to look at what challenges the OEMs face when they're building and constructing, and also the responsibilities of the site teams. It gives us valuable perspective that helps us bring the best solutions and develop products to meet new technology as it continues to evolve."

One of the challenges facing lubricant providers, like Castrol, is the continued growth of the turbines themselves, according to DiNunzio.

"Unfortunately, everything doesn't scale along with the power output," he said. "In the past, turbines were small — around 200 to 400 kW — mounted on lattice towers. Today, we're dealing with machines in the 4 to 6 MW range, which are massive pieces of equipment."

One of the biggest engineering challenges that comes with this scale is weight.

According to DiNunzio, turbine manufacturers are very cautious about placing large or heavy components at the top of the tower, since doing so can introduce significant safety risks. He noted that the high power output required from modern turbines puts substantial additional stress on the gearboxes, main bearings, and the entire drivetrain.

"The power ratio these turbines have to put out puts a lot more stress on the gearboxes and main bearings — the whole drivetrain," he said. "It just brings a lot of safety hazards with it."

THE POWER OF LUBRICATION, NOT JUST LUBRICANTS

To address the challenges, both large and small, Castrol works with customers to focus on the "total cost of ownership," according to DiNunzio.

"What truly impacts a plant's profitability isn't the upfront price of the lubricant, but how it performs over time," he said. "Castrol's philosophy is centered on delivering the lowest total cost of ownership through performance, reliability, and advanced technology. In wind, where turbines operate under extreme conditions and service access is limited, our focus has always been on maximizing lubricant technology to extend component life, reduce failures, and simplify maintenance."

DEALING WITH DIFFERENT ENVIRONMENTS

When it comes to total cost of ownership, operating environment matters because wind turbines face vastly different conditions that directly affect reliability and maintenance, according to DiNunzio. Understanding the distinct environments in which wind turbines are built is a critical part of the equation. Total cost of ownership is ultimately shaped by where the turbine operates, because the environment — whether offshore, coastal, or inland — directly affects lubricant performance, component life, and the overall value discussion.

"They're not sitting in one, neat, sunny climate," he said. "They're all over the United States — and really, all over the world. That's why we have to make products that are flexible to handle those different environments that turbines face."

Offshore wind also has its own set of challenges, according to DiNunzio, which is why offshore turbines tend to be a little more robust.

"Offshore environments make serviceability even more challenging, so longer-lasting products that extend equipment life become essential," he said. "Servicing a turbine 300 feet in the air is difficult on its own — adding a boat trip into open water makes it even tougher. That's why we design products built for these conditions, with broad OEM approvals across multiple platforms."

With that in mind, Castrol wants to ensure turbines get the best lubrication wherever they're located, according to DiNunzio.

"We need our technology to perform everywhere — from the equator to the far north, offshore or onshore," he said.

FINDING THE BEST SOLUTIONS

Staying on top of the latest developments is just part of how Castrol develops the ideal solutions for its clients, according to DiNunzio.

"There's a lot of competition in the industrial and wind space," he said. "We're all working to advance technology, understand emerging challenges, and anticipate where the industry will be in a few years. Developing, testing, and field validating new solutions takes time, so we have to project five to six years out and plan for the challenges ahead we're going to face. That's how we balance cost and technology to deliver the most value for our clients."

As a global organization, Castrol has teams all over the

Castrol's vast timeline of expertise means the company has brought a lot of unique solutions to the industry. (Courtesy: Castrol)

Castrol was one of the first lubricant companies to develop products specific for the wind industry. (Courtesy: Castrol)

world with expertise in dealing with a variety of different environments, according to DiNunzio.

"As you would expect, our teams in Europe have deeper experience with offshore turbines, while here in the United States the sheer number of onshore turbines gives us a strong base of knowledge, especially through our connection with the bp wind team," he said. "We focus on asking customers the right questions and engaging the right people. It's very important to get the opinion of the people in the field that see it firsthand. Input from field technicians, along with engineering and reliability teams, helps us understand the scale of an issue. From there, we can involve data scientists and specialists who monitor predictive technologies. Oil analysis is a core expertise for us, but we also rely on vibration analysis, temperature monitoring, and other diagnostic tools to pinpoint what's going on. We draw on experience, ask targeted questions, and we're not afraid to pull in other experts as

Staying on top of the latest developments is just part of how Castrol develops the ideal solutions for its clients. (Courtesy: Castrol)

> We focus on asking customers the right questions and engaging the right people. It's very important to get the opinion of the people in the field that see it firsthand.

needed. Troubleshooting is always better with more than one opinion."

DEVELOPING WIND-SPECIFIC PRODUCTS

Castrol's vast timeline of expertise mean the company has brought a lot of unique solutions to the industry, according to DiNunzio.

"We've developed products specific for the wind industry," he said. "We were one of the first lubricant companies to do that. We've pioneered technology that allows gear oil to be reconditioned uptower, which extends oil life and, in turn, equipment life — reducing the amount of service required, which I've dedicated a lot of time to testing and proving out the main bearing greases we've launched over the past eight years. They've boosted reliability across many platforms, earning approvals from nearly every OEM — proof of our product advantages and the industry experience behind them."

FUTURE OF WIND

Despite the current political climate when it comes to wind energy, DiNunzio said he isn't worried about the future state of the industry.

"The industry naturally cycles up and down, and wind industry has operated this way for a long time," he said. "With its dependence on the tax code, fluctuations are expected, but I am confident wind will keep growing quickly. Our energy needs are enormous, and any viable source will be highly sought after."

It's also important to remember that wind energy as a power source is still very young compared to others, according to DiNunzio.

"It's remarkable to see how far the industry has come in the 40 years we've been involved," he said. "Turbine designs have changed rapidly, and we've evolved our lubrication technology right alongside them. The materials we use today are completely different from what we used in the '80s."

Wind is still a young industry compared with traditional power sources, according to DiNunzio.

"It's learning how to scale, improve reliability, and support larger machines," he said. "That's where we fit in — developing solutions that help operators grow and get more energy from the wind. I'm excited about where wind is headed, which is why I've dedicated the past 10 years to it and expect to see even more growth ahead."

MORE INFO: www.castrol.com/wind-u

Mary Harvey

Manager ◤ The Carbon Trust

"The ultimate goal of SUSJIP is to accelerate decarbonization across the offshore wind industry."

◤ You and your colleagues recently updated the common methodology for calculating the carbon footprint of offshore wind farms through the Sustainability Joint Industry Program (SUSJIP). How was it calculated before that?

Before the SUSJIP methodology was developed, there was no sector specific guidance for calculating the carbon footprint of offshore wind farms. This is not to say there was not a lot of good work being done. There absolutely was. A lot of practitioners, from developers, academics, and consultants, were calculating carbon footprints of offshore wind farms. The problem was that there was no consistency in the methodology they used. This is because they were left to interpret cross-sector standards – standards that were not specifically written for renewable energy, let alone specifically written for offshore wind. It meant there was room for a lot of different interpretations of these standards. That led different practitioners to make different assumptions and apply different system boundaries, scopes and definitions. As a result, the calculations were inconsistent. It reduced their usefulness for decision-making and benchmarking across the offshore wind industry as a whole when everyone was using slightly different methodologies.

◤ How did you update these calculations?

We published our revised methodology in March 2026, but we had actually published our first version in September 2024. The first phase was getting group consensus among offshore wind developers primarily on how they should perform these calculations – the assumptions, system boundaries, scopes, and definitions they should be using. We were trying to iron out some of those things that could lead to misinterpretation.

When we published the first version of the guidance, we knew it wasn't perfect, but we also needed to get it out into the industry, and we needed it to be used. In this recent revision, we formed a working group of industry experts outside of the offshore wind developers themselves, which included industry academics and some other research organizations.

The second revision includes an updated reporting framework, updated templates for disclosing carbon footprints, and we've improved our guidance on data quality, sensitivity, and uncertainty. We've also provided a whole list of use cases demonstrating why you would want to use a carbon footprint calculation and why you would want to perform that assessment in the industry.

◤ What is the ultimate goal of the SUSJIP?

The Sustainability Joint Industry Program (SUSJIP) is actually wider than this methodology document. The ultimate goal of SUSJIP is to accelerate decarbonization across the offshore wind industry. It's important to remember that offshore wind, once up and running, is a form of clean-electricity generation. We know globally, the pipeline of offshore wind is expected to grow, and there are some emissions associated throughout the lifecycle of the wind farm. That's mostly in the manufacturing process – everything that goes into all of the components – and through the transport and installation, there are big vessels transporting those components globally. There are several areas where we can look at decarbonizing across the offshore wind industry. However, it's worth bearing in mind that the carbon emissions associated with offshore wind and renewable energy are much, much lower than traditional forms of electricity generation.

Alongside the harmonized carbon footprint methodology, we also have work streams focusing on data transparency and enabling consistent measurement of lifecycle carbon emissions. We are running a project that's investigating how to incentivize lower emission steel in the industry, and in another one, we're looking at improving circular principles through the refurbishment of minor turbine component parts. The SUSJIP consortium is made up of offshore wind developers. The benefit of bringing developers together is that they have a unified voice. Trying to understand their shared challenges and addressing these challenges together is more impactful than one developer alone.

You talked about harmony, in what ways does this update bring that harmony and transparency to carbon emissions measurement for the offshore sector?

We're trying to establish that single agreed-upon approach for calculating offshore wind carbon footprints. We're hoping that we're reducing the variability caused by that different interpretation of standards. We want to ensure the methodologies used for those assessments are comparable across developers, across consultants, really across the industry.

We know the methodology has been adopted more widely than just our core group of developer partners, based on feedback we've received. Having one methodology will reduce some of the confusion in the industry. Ultimately, this will strengthen confidence in results and assessments as well through better treatment of data quality and uncertainty.

How can carbon footprint calculations be used across the offshore wind industry to provide insights into baseline data, emission hotspots, and these decarbonization opportunities?

By performing these assessments for offshore wind projects, we start to understand more about the baseline data in the industry.

The uncertainty of that baseline data is highly dependent on the data quality and availability. To reduce the uncertainty, we actually need primary, or supplier-specific, data. Ideally, developers want to understand supplier-specific emission data of all their components to get the most accurate carbon footprint assessments. If that data isn't available, then the practitioner has to resort to an industry average carbon emission factor from a database. The industry baseline is actually only as good as the input data, and there is still inconsistency in the data availability and quality in the industry. This is a relatively newish practice that's happening in the offshore wind industry and suppliers, and they don't all have this data available. Wider adoption of carbon footprint assessments will naturally increase conversations between developers and suppliers, helping to improve the data quality and availability over time.

Once the lifecycle carbon footprint of the development is well understood, it's possible to identify where the emission hotspots are and ultimately use that to determine key decision points such as design, procurement, or supply chain choices, based on the lifecycle emissions.

We largely know what these hotspots are. The most intensive areas are in manufacturing and the vessel fuels used in installation, operation, and maintenance activities. A lot of steel goes into offshore components, and steel is currently the biggest emission hotspot for offshore wind developments. Addressing challenges within those areas would make a substantial difference to the overall carbon emissions of the industry.

How does the adoption of SUSJIP lead to better carbon reporting, while making it more relevant for developers?

Our methodology takes into account international standards, including the ISO 14067 and the Greenhouse Gas Protocol Product Standard and a range of standards listed in our methodology. The outputs are directly relevant for offshore wind projects and could be used for decision making. We know developers have started to use this to assess their portfolios, which makes it easier to compare projects internally and understand what's happening across their portfolio level.

Additionally, we know that carbon footprints are being considered in offshore wind auctions and tenders. If and when this is introduced, the important thing is to have harmonization, to reduce the administrative burden. If a lot of different markets use slightly different methodologies, then it becomes very complicated. The SUSJIP methodology provides this harmonized approach, which has already been adopted by our developers and more widely.

What are some real-world examples of how SUSJIP is being applied?

We have eight developer partners in Phase 2 of the program, and we know they are all aligned with the methodology internally. Alongside the mandated reporting requirements for carbon emissions, there are other reasons developers would want to understand their carbon emissions. We've published some examples of real-life case studies from three of our partners on our website:

- ScottishPower Renewables, which is part of the Iberdrola Group, has produced a case study that highlights how they apply the methodology at their portfolio level. They're looking at their key emission hotspots across their assets, which has strengthened supplier engagement and supported scenario modelling for lower-carbon design and procurement.
- We have another one from RWE, detailing how they've used the methodology to calculate the carbon footprint of their Thor offshore wind farm in Denmark, which is one of their big flagship projects, and they have used the SUSJIP framework for that.
- Ørsted's case study shows how they've aligned their internal lifecycle assessment model, which includes other metrics outside of greenhouse gas emissions, with the SUSJIP methodology to ensure that consistency and identify emission hot spots.

Is there anything else you'd like to mention that we didn't talk about?

We have a supplier specific annex for the methodology document that was scheduled to come out at the end of April. The methodology was written primarily for developers, calculating the lifecycle emissions of the offshore wind project from manufacturing all the way through to decommissioning. We know that's not always tangible for a specific supplier or component, and understanding how you can apply the methodology is a little bit trickier. This supplier-specific annex will give more guidance on how to apply the methodology for a specific area or a specific part of the life cycle.

MORE INFO www.carbontrust.com/our-work-and-impact/impact-stories/offshore-wind-sustainability-jip-susjip

Buena Vista Wind Farm in California has been refurbished with blade enhancements, modernized control equipment, and more. (Courtesy: DWT)

CONSTRUCTION

DWT refurbishes California wind farm

DWT has completed a 38-MW refurbishment project at the Buena Vista Wind Farm in California for LRE (Leeward Renewable Energy). The project began in August 2025 and was delivered on schedule in December 2025, reflecting DWT's execution and integrated engineering, procurement, and construction (EPC) capabilities.

This marked DWT's first refurbishment project with LRE and stood as a testament to strong collaboration, seamless coordination, and disciplined execution between both teams. Through teamwork and planning, the companies maintained schedule integrity while navigating demanding site conditions.

The refurbishment project included comprehensive upgrades across all 38 turbines, consisting of blade enhancements and bladework improvements, oil and hydraulic system upgrades, control equipment modernization, and power plant control system enhancements.

"We are proud to have successfully delivered the project on time and on budget," said Melf Lorenzen, CEO of DWT. "This achievement demonstrates the strength of our team and our close collaboration with LRE. By aligning technical expertise with clear communication and joint problem-solving, DWT and LRE ensured smooth implementation across all scopes of work. Even while facing weather interruptions, the teams maintained momentum and achieved completion without schedule delays."

MORE INFO www.dwtglobal.com

CONSTRUCTION

Vestas receives order for RWE offshore wind project in U.K.

Vestas recently received a firm order for RWE's 1,380 MW Vanguard East offshore wind project in the United Kingdom. This order further supports the U.K.'s advance toward its 2030 clean

Vestas received an order for 92 wind turbines for the Vanguard East offshore wind project. (Courtesy: RWE)

power targets while building crucial momentum for the wider energy transition across Europe.

The order includes 92 Vestas V236-15.0 MW wind turbines, with Vestas responsible for the supply, delivery, and commissioning of the turbines. Upon completion, Vestas will also service the assets under a five-year comprehensive service agreement followed by a long-term operational support agreement.

"RWE continues to make good progress toward realizing both of these major offshore wind projects in the U.K. with the support of Vestas, our partners KKR and a strong supply chain," said Sven Utermöhlen, CEO, RWE Offshore Wind.

"We are on track to make a final investment decision for both projects this summer, with preparations for the major offshore construction campaign following on."

"We are delighted to report a firm order for Vanguard East, on the heel of Vanguard West last month," said Nils de Baar, President of Vestas Northern & Central Europe and Global Offshore. "The Vanguard projects underscore how collaboration and long term industry commitment will deliver reliable, clean, and affordable electricity for consumers while strengthening the U.K.'s long term energy resilience. And with more than 25 years of experience in the U.K. offshore wind market, Vestas is proud to support the country's continued leadership in wind energy. Our thanks go to our partner RWE for their continued trust in our technology, and we are looking forward to delivering the project together."

The project site is off the coast of Norfolk in East Anglia. RWE is targeting a final investment decision (FID) for Vanguard East in summer of 2026, with deliveries beginning in Q4 2028, and commissioning of the project expected in 2030.

MORE INFO www.norfolkzone.rwe.com
www.vestas.com

CONSTRUCTION

IMCA launches marine contractors network

Left: Jamie Chestnutt, IMCA COO, and Marisa Achenk, Project Engineer, Subsea7. (Courtesy: IMCA)

The International Marine Contractors Association (IMCA) recently launched the IMCA Next Generation Network, a member-led network that will support the development of early career professionals.

Designed to strengthen development pathways for junior workers in the marine construction sector, the new global community forms a central pillar of IMCA's strategic focus on people, competency, and skills.

It will also support the offshore industry to raise awareness of the growing range of career opportunities in marine construction.

The IMCA Next Generation Network will provide a forum for early-career professionals to develop their careers, connect with peers and industry leaders, and shape the future of the marine contracting sector through innovation and collaboration, with activities structured around three core pillars:

- **Inspire:** Raising awareness of offshore careers among students, educators, and early-career professionals.
- **Connect:** Building a global peer community through events, digital forums, and engagement with IMCA committees.

Develop: Providing mentoring, technical insight sessions, and access to IMCA's competence and training resources.

"Developing the next generation of offshore professionals is essential to the long-term resilience of our industry," said Iain Granger, IMCA's chief executive.

"The Next Generation Network reflects our commitment to supporting members with practical initiatives that strengthen skills, enhance capability, and create clearer pathways into offshore careers. We look forward to working with the global IMCA community to build a workforce that is ready for the opportunities and challenges ahead."

"Early career professionals are telling us very clearly what they need: guidance, visibility, skills, and connection," said Lou Bendall, IMCA People Director. "This network will be built around those needs and will be designed with our junior members, not for them."

Employment trends in the offshore energy sector, which is undergoing significant transformation as markets expand, digital systems mature, and operational demands increase, will require new technical skill sets, broader multidisciplinary capability, and strong leadership at all levels. "The marine construction industry is changing fast; we cannot meet tomorrow's challenges without investing in the people who will lead it," said Jamie Chesnutt, IMCA COO. Early-career professionals who work for IMCA member companies have been invited to join the network.

Members who are later in their careers can nominate early-career colleagues, participate as mentors, and contribute to outreach initiatives across universities, schools, and training providers.

IMCA will profile the work of its Next Generation Network at events this year, including at the IMCA Global Summit 2026, October 28-29 in Antwerp, Belgium.

MORE INFO www.imca-int.com

INNOVATION

GeoForce wins Reach Subsea survey contract

GeoForce Technical Services, part of Oceanscan and the wider Venterra Group, has been selected by Reach Subsea to deliver the geotechnical component of a wider offshore survey campaign for the Shetland HVDC Link 2, a nationally significant program to strengthen Great Britain's transmission network and support future renewable energy growth.

Running from late February to August 2026, the six month campaign for Scottish & Southern Electricity Networks Transmission (SSEN Transmission) will support the development of

an approximately 330 kilometer, 2 GW subsea connection between Shetland and the Scottish mainland, forming part of SSEN Transmission's long term Beyond 2030 strategic network plan.

"We're proud to support Reach Subsea on a project of this scale and national importance," said James McDonald, GeoForce managing director. "By delivering fast, accurate geotechnical insight, we help transform complex seabed conditions into confident engineering decisions – strengthening the U.K.'s future transmission network and contributing to a more resilient, clean energy system. This award reflects the depth of our continued collaboration with Reach and the trust placed in us to support SSEN Transmission's future network ambitions."

As part of its scope, GeoForce will deliver specialist geotechnical acquisition and analysis, including seabed characterization, sediment analysis, and core penetration testing. These insights will feed directly into route optimization and installation design, giving SSEN Transmission a higher resolution understanding of subsurface conditions and de risking engineering decisions ahead of cable installation. This work is essential to ensuring the subsea cable can be routed and installed safely, efficiently, and effectively across varied offshore conditions.

The contract award builds on the established relationship between GeoForce and Reach Subsea across previous offshore site investigation projects, bringing together expertise to accelerate high quality, decision ready data delivery.

"GeoForce provides specialist geotechnical expertise that will play a key role in the success of our campaign with SSEN Transmission," said Alastair McKie, Reach Subsea UK managing director. "Their capabilities complement our integrated project delivery onboard our vessels and will help ensure we acquire the high-resolution seabed data needed to support SSEN Transmission's design and routing activities, while maintaining the highest standards of safety."

GeoForce's contribution also supports the broader role of its parent company, Venterra, in enabling offshore wind growth and subsea infrastructure development through its specialist businesses across the project lifecycle, from early stage analysis through to offshore execution.

GeoForce Technical Services will deliver the geotechnical component of a wider offshore survey campaign. (Courtesy: GeoForce)

MORE INFO www.venterra-group.com

INNOVATION

Vaisala launches weather monitoring system

Vaisala, a leader in measurement technology, has launched Maritime Automatic Weather Station AWS830, a weather monitoring solution for maritime and offshore environments. As the cornerstone of Vaisala's offshore and maritime weather systems, AWS830 delivers weather, environment, oceanographic, and motion data to Vaisala's offshore and maritime weather systems, including Vaisala Helideck Monitoring System and Vaisala's met-ocean system.

Vaisala AWS830 provides reliable, secure, and real-time meteorological and oceanographic monitoring for offshore environments. It delivers, for example, wind speed, atmospheric pressure, visibility, cloud height, air temperature, humidity, and wave height data through an expandable platform designed for demanding marine conditions. In addition to offering enhanced cybersecurity and modular design flexibility, AWS830 has been designed to meet stringent maritime safety and environmental standards.

AWS830 is available in both outdoor and server rack versions to meet the requirements of exposed on deck installations in harsh environments as well as protected indoor equipment rooms. The outdoor version is designed and tested for demanding offshore conditions, including corrosion, vibration, shock, extreme temperatures, humidity, and salinity.

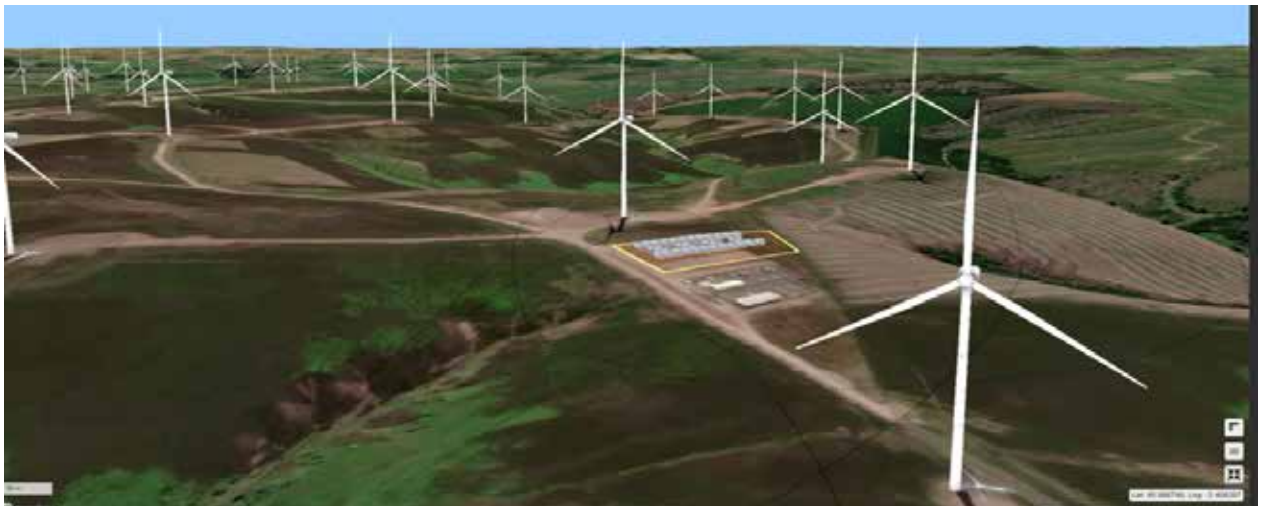
The maritime industry is driven by growing offshore energy projects and naval modernization programs. Vaisa-

Vaisala, a leader in measurement technology, has launched Maritime Automatic Weather Station AWS830, a weather monitoring solution for maritime and offshore environments. (Courtesy: Vaisala)

la AWS830 is designed to support harsh polar area operation capabilities on icebreakers, coast guard, research, and navy vessels. "AWS830 represents a fundamental next-generation advancement in maritime weather monitoring of which we have decades of experience," said Panu Partanen, Vice President, Sales and Marketing, Weather, Energy and Environment for Vaisala. "This launch reinforces our commitment to supporting the maritime operations through reliable, cybersecure weather intelligence."

As offshore operations become increasingly critical from both safety and security perspectives, it is essential to ensure weather data is always available, authentic, and accurate. Built on the industry leading Vaisala DMU801 data logger, AWS830 incorporates robust cybersecurity features, including secure boot, signed firmware authentication, and end to end encrypted communication with Vaisala Elements Helideck Monitoring Software.

Modularity of the entire weather monitoring system has been a key design driver for AWS830. Customers can choose a full Helideck Monitoring System solution using the CAP437 compliant Vaisala Elements Helideck Monitoring Software, or they can integrate the station with their ship navigation and automation systems. In addition to supporting Vaisala's industry leading sensor portfolio and select third party sensors, the system can be easily con-



Youwind has launched BESS, a Battery Energy Storage System module. (Courtesy: Youwind)

figured to accommodate additional sensors as needed.

"Maritime operations demand weather monitoring systems that perform flawlessly while meeting stringent safety and environmental standards," said Mikko Nikkanen, Head of Maritime at Vaisala. "Our customers need systems they can depend on and trust for critical operational decisions. AWS830's reliability, cybersecure design, and modular features make it ideal for modern and efficient offshore operations." Deliveries of the Vaisala Maritime Automatic Weather Station AWS830 will be available in June 2026.

MORE INFO www.vaisala.com

INNOVATION

Youwind unveils battery storage system

Youwind, a web-based wind energy platform designed to accelerate the development of wind-energy projects, has launched the BESS (Battery Energy Storage System) module, enabling developers to design, analyze, and optimize hybrid wind and storage projects within a single integrated environment.

As a result, hybrid wind and storage projects are rapidly becoming the new standard in project development. Developers are facing growing complexity. Projects must now be evaluated not only on energy yield, but also on grid integration, revenue optimization, and market participation strategies. However, many still rely on fragmented tools to assess wind and storage separately. With the introduction of its BESS module, Youwind addresses this challenge by enabling a fully integrated approach to hybrid project design, allowing users to combine wind and storage analysis from the earliest stages of development five to 10 times faster compared to standard fragmented desktop software.

"Hybridization is no longer optional, it is becoming a fundamental part of project development," said Anna Rivera, CEO of Youwind. "We are thrilled to bring the required technology and make it accessible to more players to address the challenges behind hybrid configurations. "With the addition of BESS, we are helping developers move away from fragmented workflows and towards a more integrated, efficient, and data-driven way of designing energy projects."

The module allows developers to identify optimal locations, design, and customize storage layouts, and evaluate both technical and financial performance across multiple scenarios. By bringing these capabilities into one platform, Youwind enables faster, more informed decision-making while reducing uncertainty in early-stage project development.

MORE INFO www.youwindrenewables.com

INNOVATION

Software firm raises funding for tool to reduce project costs

Kinewell, an award-winning U.K. company whose software helps optimize the design of offshore windfarms, has raised 750,000 pounds in the first investment by the new North East Accelerate Fund, which is managed by Mercia Ventures.

Kinewell's solutions have been used on projects worldwide and the company won the King's Award for Enterprise for International Trade in 2025. The investment will unlock a further six-figure sum in grant funding, bringing the total raised to more than 1 million pounds. It will enable Kinewell to accelerate technology development and commercialization, and to almost double in size within the next six months with the creation of 10 new jobs. Ki-

newell, based in Wallsend, North Tyneside, was founded by engineer and now CEO Andrew Jenkins while he studied for a PhD at Newcastle University. The first product, launched in 2015, helps to optimize the design of cable layouts.

"Offshore wind is an ideal way to decarbonize our energy supply and improve energy security," Jenkins said. "Our goal is to bring down costs and reduce the time it takes to develop new wind farms, which in turn will make wind energy more attractive and help unlock further investment into the industry."

The technology, which combines AI, supercomputing power and advanced algorithms, can assess millions of different options and identify the most effective materials and layouts in minutes. It typically saves 20 percent on the costs of the cabling system while cutting months off the development time. The company now also offers software to design turbine layouts and transmission systems. Its latest products take account of the interactions between all three (cabling, turbine, and transmission systems) and claim to reduce the cost of offshore wind farms by 6 percent, which can make all the difference when securing investment for a project.

Kinewell employs 12 staff and has a client base that includes global players such as Equinor, SSE Renewables, Parkwind, and Eurus Energy. The Accelerate funding is its first external investment. The company is working on three grant-funded innovation and development projects. The global offshore wind market was valued at about $56 billion in 2024 and is projected to reach almost $299 billion by 2034, according to a Research and Markets report. A recent wind auction by the U.K. government secured a record 8.4 GW of capacity and unlocked 22 billion pounds of investment.

"Kinewell has achieved remarkable success despite limited investment to date," said Chris McCourt from Mercia Ventures. "With offshore wind entering a new growth phase, it is well positioned to capitalize on this. This investment will help unleash its potential and secure its position as the leading software of its type for the industry."

MORE INFO kinewell.co.uk

MAINTENANCE

Chartwell Marine partners with Japan shipbuilders group

Chartwell Marine, a pioneer of next-generation vessel demand, and the Cooperative Association of Japan Shipbuilders, an industry organization representing 59 shipyards in Japan, have signed a Memorandum of Understanding to support the development and local construction of vessels for Japan's offshore wind industry. The collaboration will focus on Crew Transfer Vessels and Service Operation Vessels, based on Chartwell Marine's conceptual designs that have been introduced in Japan through a Nippon Foundation-supported program led by CAJS.

Under the memorandum, the companies will work together to support Japanese shipowners, operators, and shipyards on potential vessel projects and the early stages of design development. CAJS will act as a bridge between domestic stakeholders and Chartwell, facilitating communication and knowledge exchange to support locally built vessels that meet project requirements and local content rules.

"As Japan's offshore wind sector ramps up and demand for locally built support vessels grows, collaboration with experienced international design partners is increasingly important," said Hiroyuki Nishida, Managing Director of the Cooperative Association of Japan Shipbuilders. "Chartwell brings extensive experience in the design and delivery of proven CTV and SOV vessels operating in global markets. By working together, we can help support the development of locally construct-

ed vessels and contribute to the long-term growth of the industry." "We are pleased to formalize our collaboration with CAJS, building on the work we have been doing together since 2023," said Andy Page, Managing Director of Chartwell Marine. "Their efforts in connecting shipyards and enabling cooperation are helping lay the foundations for a stronger offshore wind vessel supply chain in Japan. We look forward to continuing to work closely with CAJS and Japanese stakeholders as the offshore wind sector scales up." The agreement may also extend in the future to support other advanced vessel types, including battery-powered and hybrid high-speed passenger vessels.

MORE INFO www.chartwellmarine.com

MANUFACTURING

Vestas plans nacelle, hub factory in Scotland

Vestas recently announced plans to establish a nacelle and hub factory in Scotland, U.K., to meet growing demand for offshore wind in the U.K. and Europe. The factory, a capital investment in excess of 250 million euros, would produce nacelles and hubs for Vestas' flagship offshore wind turbine, the V236-15.0 MW.

The investment would create up to 500 skilled direct jobs, support further indirect jobs in the wider economy and underpin a supply chain critical to meeting the UK's clean power targets and energy security. The announcement follows record-breaking AR7 auction results in January 2026, a growing offshore wind order book for Vestas in the U.K., and strategic discussions between the U.K. government, the Scottish government, and Vestas on the next steps to develop and co-invest in the facility. The final investment decision is conditional on securing sufficient U.K.-based orders in AR7 and AR8. Subject to the timing of those results, and the planning process, the facility could start production by 2029/2030. The plan also includes identifying opportunities for co-locating sub-suppliers of other major components.

"The U.K. government has made a big statement with AR7, showcasing how wind energy creates a positive impact on energy security, sustainability, and affordability for end consumers.We welcome the U.K. and Scottish governments' dedication to fostering a competitive offshore wind market and look forward to working together to progress our co-investment plans," said Henrik Andersen, CEO Vestas. "Establishing a nacelle and hub assembly factory in Scotland would create hundreds of local jobs and support further jobs across the wider supply chain, delivering long lasting economic benefits to the region."

"The government's clean-energy mission is delivering good industrial jobs for Scottish workers, boosting growth as part of our drive to give the U.K. energy security," said energy secretary Ed Miliband. "This is happening because of the government's record-breaking offshore wind auction and the confidence our mission has given industry to invest in Scotland. We will not stop in driving to create many more jobs like these for Scotland and the U.K."

"Vestas's proposal to develop a hub and nacelle factory in Scotland, with the potential to support hundreds of jobs, speaks to the huge potential of the Scottish offshore wind sector and our attractiveness as an investment destination," said Kate Forbes, deputy first minister and economy secretary. "Scottish Ministers have engaged closely with Vestas since 2021, and we look forward to continuing to work with the company and delivery partners to develop our offshore wind supply chain and deliver long-term economic benefits for our communities."

The announcement demonstrates Vestas's ambition to grow the U.K.'s supply chain and an approach to invest where a strong and visible pipeline can support a competitive and sustainable business case. The potential factory in Scotland would become Vestas' fifth factory in Europe dedicated solely to the manufacturing of offshore wind turbine nacelles and blades.

MORE INFO www.vestas.com

MANUFACTURING

Waukesha to make NordAlign bearing for turbine main shafts

Waukesha Bearings, a leader in the design and manufacture of advanced fluid film bearings and magnetic bearing systems, has launched the NordAlign bearing, specifically engineered for wind-turbine main shafts. This technology aims to enhance turbine reliability, reduce maintenance costs, and streamline installation.

"Waukesha Bearings is committed to advancing technologies that not only improve efficiency, but also reduce operational costs for our customers," said Chris Johnson, VP and general manager of Engineered Bearings.

"The introduction of the NordAlign bearing represents a significant step forward in wind-turbine technology, aligning with our mission to deliver innovative solutions that meet the evolving needs of the renewable energy sector." NordAlign bearings' tilt pads adjust dynamically to both radial and axial shaft movements, optimizing load distribution and extending the bearing's lifespan.

When maintenance and repairs are needed, NordAlign bearing pads can be exchanged uptower, effectively eliminating the need for expensive jack-up vessels and cranes. Its modular design scales to accommodate larger wind-turbine models, while the optimized pad shape allows for straightforward integration into the nacelle, simplifying installation whether retrofitted to existing equipment or installed in a new application. NordAlign bearings deliver advanced performance across a wide range of operating conditions, including assembly, low-speed idling, and extreme events.

MORE INFO www.waukbearing.com

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THE ROLE OF BUBBLE CURTAINS IN OFFSHORE WIND

Bubble curtains – the crucial solution that releases air bubbles that rise and create a barrier in the water – help to reduce underwater noise, limit the spread of contaminants, and protect marine life during offshore operations. (Courtesy: Aggreko)

Oil-free air compressors can play a critical part in the deployment of bubble curtains in order to safeguard marine environments such as wind-farm construction and more.

By ALAN DUNNE

It's no surprise we've been hearing a lot about wind lately. According to the Global Wind Energy Council (GWEC), 27 countries have set national targets for offshore wind, with offshore wind capacity projected to almost triple between 2024 and 2030, increasing from 83 GW to 238 GW [1].

A recent example of this growing momentum came in January 2026, when it was announced that the U.K. is joining nine other European countries in building a power grid in the North Sea, accelerating the rollout of offshore windfarms in the 2030s. It's expected to provide 100 GW of offshore wind power, or enough electricity capacity to power 143 million homes [2]. This record haul of offshore wind energy is necessary for Europe's ongoing green transition. However, this leads to an inevitable acceleration of underwater construction, which does not exist without harm or risk to the very environment we're trying to protect.

A spotlight should be shone on the technology and innovation that ensures marine ecosystems are protected throughout intense underwater construction. Specifically, the critical role of bubble curtains and the oil-free air compressors that power them.

Bubble curtains – the crucial solution that releases air bubbles that rise and create a barrier in the water – help to reduce underwater noise, limit the spread of contaminants, and protect marine life during offshore operations. A great idea in principle and in practice.

HIDING IN PLAIN SIGHT

Firstly, pipes are laid on the seabed around a site, with a perforated hose connected to the compressors, which provide clean, oil-free air. The airflow rate and pressure are both adjusted to achieve the desired bubble size and density. Diffusers positioned on the seabed then release compressed air as bubbles into the water.

These bubbles alter the water's density, creating a sound barrier to protect marine life and control noise pollution. Double or triple bubble curtains may also be used for enhanced noise mitigation.

Alongside offshore wind construction and shipping, bubble curtains can help contain and control the spread of sediments during dredging operations, preventing them from muddying surrounding waters. As a result, this protects sensitive marine ecosystems, such as coral reefs, from being layered with fine particles. The same can be said for subsea pipeline installations, whereby bubble curtains are used to manage the displacement of water and sediments.

Other applications include being used during pile driving to restrict noise created by installing offshore platforms and underwater welding to create a dry work environment and for the prevention of ice build-up in cold climates. They can even be used to contain and control oil spills. Here, oil is gathered into a concentrated area, allowing for decontamination and recovery methods to be implemented easily. In addition to limiting noise emissions, bubble curtains can also reduce algae growth and increase oxygen levels to safeguard marine life and improve overall water quality. The former is achieved by preventing jellyfish from entering fish pens.

Stringent environmental regulations mandate the installation of bubble curtains in several key regions of the offshore wind industry. (Courtesy: Aggreko)

RULES AND REGULATIONS

Stringent environmental regulations also mandate the installation of bubble curtains in several key regions of the offshore wind industry. While the North Sea, for instance, houses more than 40 offshore wind farms [1] and almost 200 oil platforms [2], it is also home to endangered marine species, such as bottlenose dolphins and harbor porpoises.

As a result, strict environmental rules are in place to ensure that any underwater construction activities must be conducted in a safe and environmentally friendly manner. The Offshore Petroleum Activities Regulations (2001) stipulates that projects likely to have a significant effect on protected sites must undergo an assessment to evaluate their

potential impact on conservation objectives [3]. Similar regulations can be found in both the Baltic and Mediterranean Seas, with particularly stringent rules designed to prevent oil pollution.

ENSURING COMPLIANCE

When it comes to ensuring environmental compliance with bubble curtains, oil-free air compressors eliminate the need for airborne oil and prevent the risk of oil contamination during critical processes such as offshore wind farm construction, oil and gas exploration, and underwater drilling, protecting marine life in the process. Crucially, Aggreko's range of oil-free air compressors meets the strict ISO 8573-1 Class 0 certification, assuring the highest level of air purity required for sensitive applications like bubble curtains.

Oil-free air compressors are engineered to optimize efficiency, reducing energy consumption and operational costs associated with bubble curtains.

Oil-free air compressors are engineered to optimize efficiency, reducing energy consumption and operational costs associated with bubble curtains. (Courtesy: Aggreko)

AD INDEX

Oil-free air compressors eliminate the need for airborne oil and prevent the risk of oil contamination during critical processes such as offshore wind farm construction. (Courtesy: Aggreko)

For instance, Aggreko's electric VSD-driven compressors offer emission-free operations, while its diesel-powered solutions are Stage-V-certified, making them the ideal temporary modular solution, short or long term, for those tasked with achieving ambitious emission reduction targets.

A HELPING HAND

While it's safe to say that bubble curtains are an indispensable tool in underwater environments, choosing the right compressors is equally important in ensuring these systems operate efficiently and without the risk of environmental contamination. By leveraging these solutions, this ongoing demand of offshore wind projects can be met, while safeguarding marine life.

When it comes to specifying oil-free air compressors to work alongside bubble curtains, third-party expertise can be a real helping hand, particularly to the growing number of decisionmakers facing staff and subsequent skills shortages. Aggreko's engineering team offers extensive sector-specific knowledge, with the ability to deliver robust oil-free air compressors adaptable to various project sizes and air demands.

Stakeholders also have the chance to implement a 24/7 remote monitoring system, which enables greater control over utility provision. The Aggreko Remote Management (ARM) service offers real-time insights into the air compressor's performance and alerts operators of any issues well before they risk bringing processes to a halt.

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