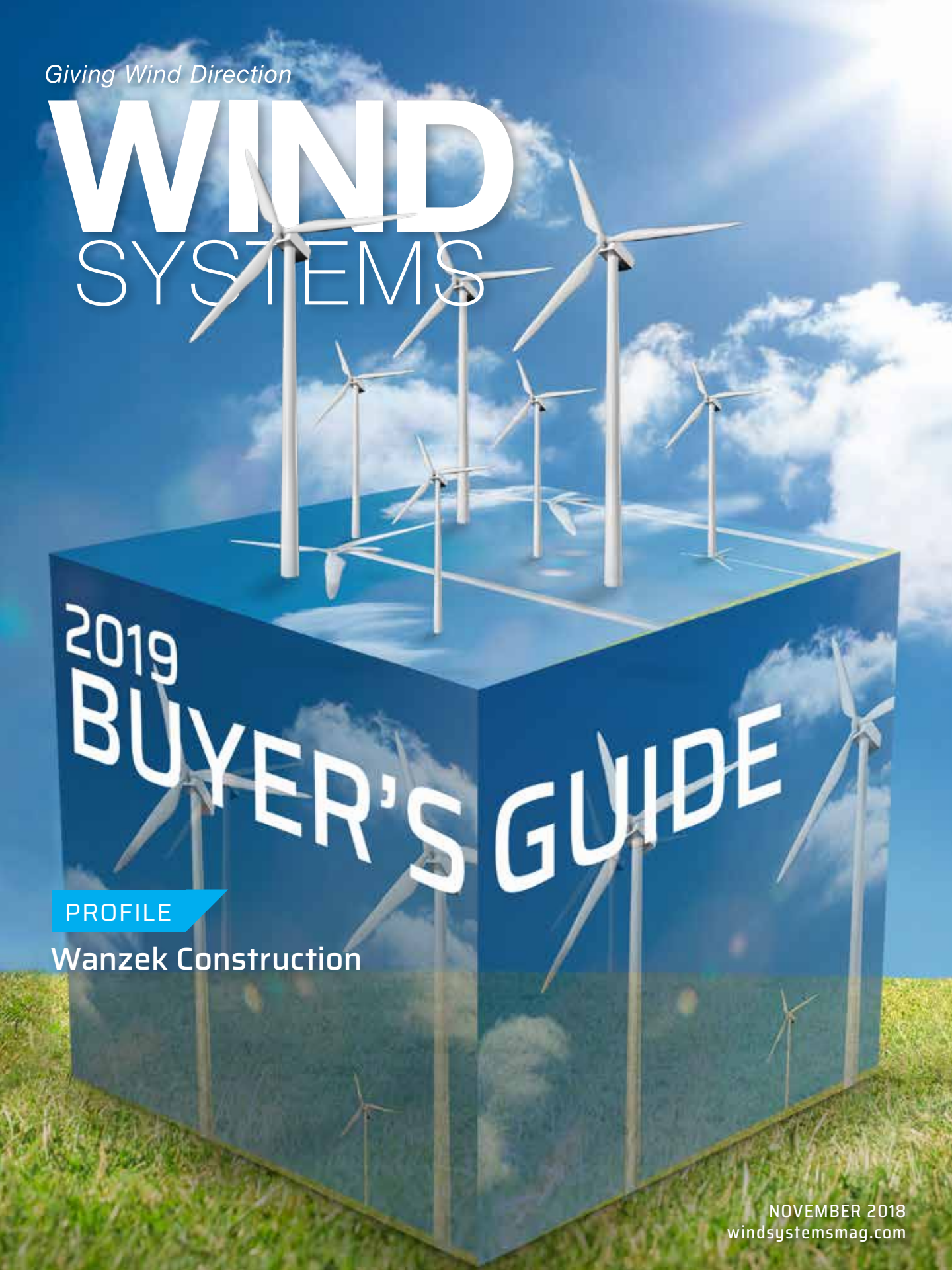
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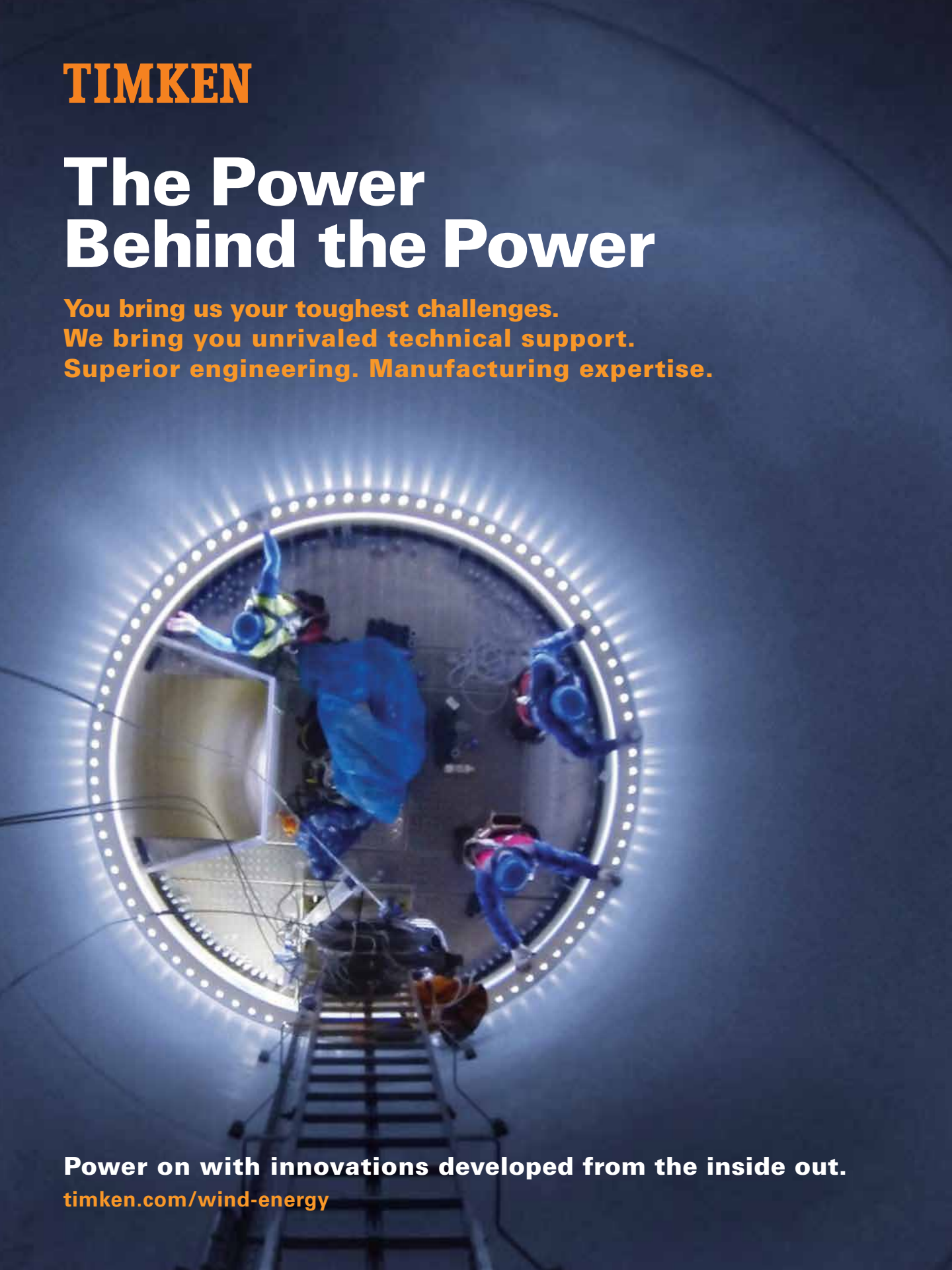

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When it comes to wind energy, it's not just about what you do, but also who you know. Identifying quality sources for equipment and services is a critical component of your overall business plan, but it can be a time-consuming task. That's why we publish the *Wind Systems* Buyer's Guide each year: to help you connect with the suppliers you need as well as to steer companies who require the products and services you provide.

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# 2019 Buyer's Guide: Your go-to source

Ever since *Wind Systems* began publishing, we have brought you our Buyer's Guide, an annual resource of company listings in the wind industry. This valuable issue is categorized and organized to best fit your — our readers' — needs. Compiled in these pages, you'll find names, phone numbers, and websites of the hundreds of companies we've made contact with over the years.

And just like the ever-growing wind industry, the listings in the Buyer's Guide grows with it, serving as a tribute to the strides wind power has made in just a short time.

We at *Wind Systems* want to encourage, cultivate, and educate a workforce of industry professionals that have a common goal — a profitable, economical, and ecological world of wind power.

The Buyer's Guide will help serve you as a go-to information guide and resource for the wind-energy industry.

We work throughout the year to make sure the companies listed in the Buyer's Guide are either directly involved in wind or provide it with products or services.

But as informative as the listings in our Buyer's Guide are just by themselves, that's not all that's included in this month's *Wind Systems.*

In addition to our valuable listings, you'll find a company profile on Wanzek Construction and how it became one of the first heavy industrial construction firms to move into the renewable energy field almost 20 years ago.

In our Crosswinds feature, guest contributor Ralitsa Peycheva shares his insights about smart maintenance and how asset owners should approach this growing essential part of wind energy.

If your company isn't listed but would like to be, or if you need to update your existing listing, please contact us at info@windsystemsmag.com and include "2020 listings" in the subject line. Also, please make sure to include your company name, phone number, and website as you want them to appear. And don't forget to include the section and category your company should be in.

*Wind Systems'* 2019 Buyer's Guide is here to serve you, so make sure you keep it within reach through the end of this year and all through the next.

And as always, thanks for reading!

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# Wind power: A story of American growth

**From AWEA**

Many people know that wind energy creates benefits in all 50 states, providing affordable, reliable electricity for millions of American homes and businesses. It also supports more than 105,000 well-paying U.S. jobs while reducing harmful pollution. Yet a recent article by Stephen Moore ignores all of this, instead spreading misleading claims and outdated information.

The fact of the matter is that wind power, along with other renewables, helps meet America's demand for affordable energy. Over the past decade, the cost of renewables has fallen as we continue to innovate and improve transmission. In the last eight years alone, the cost of wind power has dropped more than 67 percent, making it the cheapest source of new electricity in many parts of the country.

## ACROSS THE POLITICAL SPECTRUM

States red and blue have enthusiastically embraced wind. For example, in 2017, Iowa generated more than 36 percent of its electricity using wind. It's also noteworthy that Iowa has among the lowest electricity rates in the country, pouring cold water on the notion that wind energy is expensive.

But cost reductions, reliability, and new jobs are not the only ways wind has contributed to the country. Wind has also helped reduce harmful air pollution that creates smog and triggers asthma attacks. Air pollution also happens to be more prevalent in low-income areas, meaning wind can help improve health outcomes there. In fact, wind energy created $8 billion in public health savings in 2017 alone by contributing to cleaner air.

These are tangible savings and quality of life benefits for everyone, especially low-income and rural communities. And wind power brings huge amounts of economic development to communities most in need of new opportunities — more than 75 percent of wind projects are built in low-income areas. That means job creation and new revenue go right to the people who need it most.

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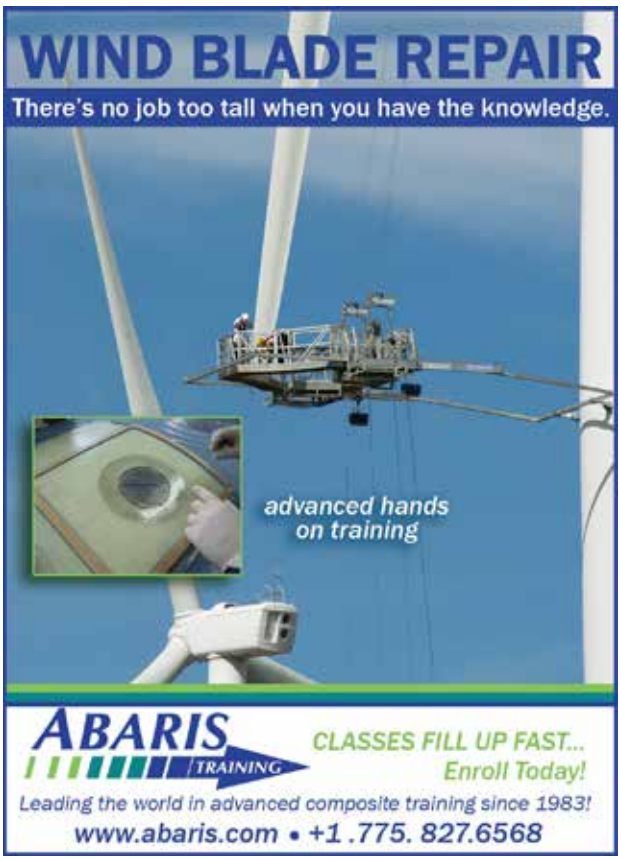
The American Wind Energy Association (AWEA) is the premier national trade association that represents the interests of America's wind energy industry. For more information, go to www.awea.org



PROFILE

WANZEK CONSTRUCTION

# PART OF A LOWER-COST SOLUTION

Wanzek Construction was hired to construct the Cimarron II Project Substation and the Buckner 345 kV switchyard (Sunflower Electric Power Corporation) near Cimarron, Kansas. (Photos courtesy: Wanzek Construction)

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*As one of the first heavy industrial construction firms to move into renewable energy, Wanzek Construction aims to reduce maintenance costs to owner-operators.*

By WIND SYSTEMS STAFF

The cost of maintaining wind turbines is a growing concern to owner-operators and often the main threat to profitable operations. But the renewable services division of Wanzek Construction is focusing on ways to minimize that expense.

"A lot of the wind industry's installed base dates back to 2007 and 2008," said John Nichols, Wanzek's senior director of Business Development. "They're reaching the 10-year mark, and their Original Operations and Maintenance contracts are expiring. That's a big opportunity for owner-operators, who can use efficiencies gained in the last decade to renegotiate new agreements at a very competitive price. Wanzek has strategically positioned ourselves to be part of this lower-cost solution."

Nichols said most renewable energy power purchase agreements are negotiated at a fixed price.

"Prices today are lower than they were 10 years ago," he said. "Now owner-operators may be able to adjust their margins by remodeling their O&M agreements."

## ONE OF THE FIRSTS

Wanzek is based in West Fargo, North Dakota, and it was one of the first heavy industrial construction firms to move into the renewable energy field almost 20 years ago. Today, its renewable services division is experiencing major growth across the country, due not only to its long experience and insight into the technologies on which the industry is based, but also its record of finding innovative solutions to the issues that can plague power-generation projects.

Heavy cranes are essential for performing major repairs on wind turbines. Replacing turbine blades, main bearings, gearboxes, and generators all require a crane to be moved on-site, then removed when the task is complete. The cost of transportation, set-up, and tear-down affects operators' decisions on whether to perform necessary repairs immediately or defer them, leaving the unit offline until a number of projects can be grouped to make the investment more cost-effective.

With a fleet of all-terrain, rough-terrain, lattice-boom crawlers and hydraulic truck cranes, Wanzek has earned recognition on the *American Cranes & Transport* magazine's list of North America's largest crane-owning companies. The company has strengthened its relationships with crane suppliers and large rental vendors. It has entered into long-term lease agreements to ensure access to essential heavy hydraulic equipment whenever and wherever the need arises.

## NEED FOR CRANES

"Most sites need 350- to 600-ton cranes a couple times every year," Nichols said. "Advances in technology have improved turbine component design in recent years, which often makes it more cost-effective to replace certain elements sitewide, extending the life of a site by 10 years or longer."

Decommissioning also will continue to require the use of heavy cranes.

Wanzek's extensive crane fleet and expertise in engineering and planning for crane transport, rigging, heavy lifts and service are among the keys to the company's growth in O&M.

"We're growing exponentially," Nichols said. "We're looking to be in the top tier of service providers in this market space."

Rob Lee, whom Wanzek named executive vice president earlier this year, agreed with Nichols' optimism about the growth of renewable energy services.

"We have great expectations for expanding our operating groups in solar, EPC power, and renewable services, while maintaining our market share in wind," he said. "We're also actively tracking the oil and gas market as it recovers from its slow-down."

## WANZEK'S WIND PORTFOLIO

A heavy industrial contractor serving clients across North

Wanzek was the EPC contractor for this project. Eclipse Wind is a 200.1 MW wind farm consisting of 88 Siemens 2.3MW turbines and will interconnect with a transmission system at a 34.5kV to 345kV interconnection substation. The scope of work included 20.8 miles of roads and 41,263 CY of concrete.

**Most sites need 350- to 600-ton cranes a couple times every year. Advances in technology have improved turbine component design in recent years, which often makes it more cost-effective to replace certain elements sitewide, extending the life of a site by 10 years or longer.**

America, Wanzek provides construction services to the renewable energy, power, oil and gas, infrastructure and industrial sectors, as well as crane services and maintenance of operating plants. Today, wind projects represent the largest part of the firm's portfolio.

Nichols said that ensuring safety continues to be a central focus as the company grows.

"Maintaining a safe and productive work environment is important to our leadership team as well as our clients, he said. "We strive to be the best at all levels. Our mission is to partner with our clients to better understand their needs, provide valuable solutions, and reduce maintenance costs and reduce costs based on proven methods, techniques, and execution strategies. We do this through our commitment to safety, planning, execution, and teamwork."

This is an exciting time to be part of the renewables industry as the market mushrooms, according to Nichols.

"This is one of the fastest growing markets I've seen in the past 10 years," he said.

Nichols said he spent six years with Siemens Energy, Inc., before joining Wanzek in December 2016.

"We're seeing 25 to 30 percent year-over-year growth, he said. "The future is extremely bright for O&M in the renewable energy space."

Wanzek's leadership in the rental, operation, and transport of heavy cranes is part of its ongoing effort to make renewable energy more competitive overall against fossil fuels.

Innovations will help drive parity, according to Nichols, between natural gas and wind plants — and ultimately make wind even more favorable in comparison with fossil fuels' volatility due to environmental and outside political factors.

"Renewable power is clearly a big part of our future," he said. "We're building, expanding, and planning to be one of the top-tier service providers as the industry continues to develop."

# MAKE PLANS TO ATTEND TOP-RATED CONFERENCES

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October 1 – 2, 2018 | New York, NY

**Wind Energy Finance & Investment Conference - West**
October 5, 2018 | San Francisco, CA

**Offshore WINDPOWER Conference & Exhibition**
October 16 – 17, 2018 | Washington, DC

**Wind Energy Fall Symposium**
November 13 – 15, 2018 | Colorado Springs, CO

**Wind Project O&M and Safety Conference**
February 27 - 28, 2019 | San Diego, CA

**Wind Power on Capitol Hill**
March 5 - 6, 2019 | Washington, D.C.

**Wind Project Siting and Environmental Compliance Conference**
March 26-27, 2019 | Albuquerque, NM

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www.tvigroup.com

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www.bachmann.info

**Baldor Electric Company**
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www.baldor.com

**Emerson Power & Wat**
www2.emersonprocess.com

**Midori America Corporation**
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www.midoriamerica.com

**Rittal Corp.**
(937) 399-0500
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**Spirae**
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**Staco Energy Products Co.**
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**Tier Electronics**
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www.tierelectronics.com

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www.awleil.com

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www.abilenehighlift.com

**Abet Crane & Rigging Corp.**
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www.abetcrane.com

**Actek Manufacturing & Engineering**
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www.actekmfg.com

**Big Iron Crane Service LLC**
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www.bigironcrane.com

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**Crane Rental Corp.**
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www.cranerental.com

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**CR Holland Crane Service, Inc.**
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**Essex Crane Rental Corp.**
(847) 215-6500
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**Hinkel Equipment Rental**
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**Irving Equipment**
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www.irvingequipment.com

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www.kbenergy.com

**Renewable NRG Systems**
(802) 482-2255
www.nrgsystems.com

**R&J Services**
(307) 399-1517
www.rjsrv.com

**Sabre Towers and Poles**
(866) 254-3707
www.sabretowersandpoles.com

**Sentrex Wind Services, Inc.**
(506) 849-0026
www.sentrexwind.com

**Turris Corp.**
(905) 877-8885
www.turriscorp.com

**WINData, Inc.**
(406) 209-8111
www.windata-inc.com

### NETWORKING

**Amphenol Fiber Systems International**
(800) 472-4225
www.fibersystems.com

**FreeWave Technologies**
(303) 381-9200
www.freewave.com

**Hirschmann Automation**
(717) 217-2200
www.hirschmann.com

**MSI Tec, Inc.**
(866) 397-7388
www.msitec.com

**N-TRON**
(251) 342-2164
www.n-tron.com

**Panduit Corp.**
(800) 777-3300
www.panduit.com

**Sixnet LLC**
(518) 877-5173
www.sixnet.com

### OCEAN SHIPPING SERVICES

**Atlantic Container Line**
(908) 518-5300
www.aclcargo.com

**Bellville Rodair International**
(713) 921-5544
www.bellvillerodair.com

**Blue Water Shipping U.S., Inc.**
(908) 624-0070
www.bws.dk

**Keppel AmFELS**
(956) 831-8220
www.kepcorp.com

### POWER CONDITIONING EQUIPMENT

**Arteche PQ, Inc.**
(262) 754-3883
www.apqpowercom

**Mangoldt Reactors**
(262) 618-2403
www.mangoldt.com

**Northeast Power Systems**
(518) 792-4776
www.nepsi.com

**Parker Hannifin-SSD Drives**
(800) 272-7537
www.parker.com

**Phase Technologies**
(605) 343-7934
www.phasetechnologies.com

**Power Magnetics, Inc.**
(609) 695-1170
www.powermagneticsinc.com

**PSI Repair Services, Inc.**
(734) 853-5000
www.psi-online.com

**S&C Electric Co.**
(773) 338-1000
www.sandc.com

**United Chemi-Con Corp.**
(847) 696-2000
www.chemi-con.com

### POWER METERING/ RELAYING EQUIPMENT

**Beckwith Electric Co.**
(727) 544-2326
www.beckwithelectric.com

**Elspec North America, Inc.**
(815) 266-4210
www.elspec-ltd.com

**LEM U.S.A.**
(800) 236-5366
www.lem.com

**Rodan Energy & Metering, Inc.**
(905) 625-9900
www.rodanpower.com

**Schweitzer Engineering Laboratories, Inc.**
(509) 332-1890
www.selinc.com

**ZIV U.S.A., Inc.**
(877) 948-8721
www.zivusa.com

### POWER STORAGE

**ClearSpan-a division of TekSupply**
(800) 835-7877
www.teksupply.com

**Dynapower Corp.**
(800) 292-6792
www.dynapower.com

**Energy Storage and Power LLC**
(908) 658-4484
www.energystorageandpower.com

**Exide Industrial Energy**
(678) 566-9000
www.exide.com

**Hydrogenics**
(905) 361-3660
www.hydrogenics.com

**ZBB Energy Corp.**
(262) 253-9800
www.zbbenergy.com

### PROJECT DUE DILIGENCE

**Aero Solutions LLC**
(720) 304-6882
www.aerosolutionsllc.com

**AMEC**
(602) 733-6000
www.amec.com

**Apex Clean Energy**
(434) 220-7595
www.apexcleanenergy.com

**AWS Truepower LLC**
(518) 213-0044
www.awstruepower.com

**DNV GL**
(281) 396-1000
www.dnvusa.com

**White Construction, Inc.**
(800) 355-9401
www.whiteconstruction.com

**Wind Prospect, Inc.**
44 117 3017 151
www.windprospect.com

## RAILROADS

**BNSF**
(800) 795-2673
www.bnsf.com

**Canadian Pacific**
(877) 225-5277
www.cpr.ca

**CN**
(888) 668-4626
www.cn.ca

**CSX Transportation**
(800) 232-0144
www.csx.com

**Norfolk Southern**
(855) 667-3655
www.nscorp.com

**Union Pacific Carrier Services**
(800) 877-5631
www.upds.com

## SUBSTATIONS

**ABB, Inc.**
(800) 435-7365
www.abb.us

**Aubrey Silvey Enterprises, Inc.**
(770) 834-0738
www.silvey.com

**Beta Engineering LLC**
(318) 487-9599
www.betaengineering.com

**Border States Electric**
(800) 676-5834
www.borderstates.com

**CG Power Systems**
(636) 239-9300
www.msepower.com

**Champion Charter**
(800) 562-7114
www.champion-charter.com

**DIS-TRAN Packaged Substations**
(318) 448-0274
www.distran.com

**Dynamic Ratings**
(720) 556-2206
www.dynamicratings.com

**Hamby Young**
(800) 726-8444
www.hambyyoung.com

**HBI Associates, Inc.**
(806) 352-4960
www.hbiassociates.com

**Hitachi HVB, Inc.**
(770) 495-1755
www.hvbi.hitachi.us

**Keystone Electrical**
(515) 283-2567
www.keystoneemc.com

**KVA Supply Co.**
(303) 217-7500
www.kvasupply.com

**MVA Power, Inc.**
(450) 589-0445
www.mvapower.com

**PACS Industries, Inc.**
(516) 465-7100
www.pacsindustries.com

**PAResources Substation**
(414) 258-2366
www.electricalsubstations.com

**S & C Electric Company**
(773) 338-1000
www.sandc.com

**Southern States LLC**
(770) 946-4562
www.southernstatesllc.com

**Trachte, Inc.**
(608) 835-5707
www.trachteusa.com

**Valmont Newmark**
(402) 963-1000
www.valmont.com

## SWITCHES/ SWITCHGEAR

**ABB, Inc.**
(800) 435-7365
www.abb.us

**Acorn Technology Corp.**
(915) 784-3500
www.acorntechncorp.com

**AZZ-Central Electric Manufacturing Company**
(573) 642-6811
ww.azz.com/central-electric

**Concast, Inc.**
(507) 732-4095
www.concastinc.com

**Federal Pacific**
(276) 669-4084
www.pacswitchgearllc.com.com

**G&W Electric**
(708) 388-5010
www.gwelec.com

**PACS Industries, Inc.**
(516) 465-7100
www.pacsindustries.com

**The Tagos Group LLC**
(713) 850-7031
www.tagosgroup.com

## THIRD-PARTY LOGISTICS

**American Transport, Inc.**
(412) 788-8878
www.thetii.com

**Blue Water Shipping U.S., Inc.**
(954) 764-3190
www.bws.dk

**Cargotec Corporation**
(419) 482-6000
www.cargotec.com

**C.H. Robinson Project Logistics, Ltd.**
(800) 323-7587
www.chrprojectlogistics.com

**Sotech Nitram**
(800) 763-1353
www.sotechnitram.com

**Union Pacific Carrier Services**
(800) 877-5631
www.upds.com

**Vectora Transportation**
(312) 646-7260
www.vectoratransportation.com

## TOOL/EQUIPMENT LEASING

**Bolttech-Mannings**
(724) 872-4873
www.bolttech.com

**Mersino**
(866) 637-7466
www.mersino.com

**Northeast Industrial Bolting & Torque**
(484) 951-6628
www.nibtorque.com

## TOOLS/ TENSIONING

**AIMCO**
(800) 852-1368
www.aimco-global.com

**Alltite**
(800) 498-6721
www.alltite.net

**Applied Bolting Technology**
(800) 552-1999
www.appliedbolting.com

**Atlas Copco**
(248) 373-3000
www.atlascopco.us

**Aztec Bolting Services, Inc.**
(281) 338-2112
www.aztecbolting.com

**Boltight, Ltd.**
44 845 500 5556
www.boltight.com

**California Torque Products**
(626) 320-1030
www.caltorque.com

**Chicago Pneumatic**
(800) 720-4049
www.cp.com

**Enerpac**
(800) 433-2766
www.enerpac.com

**Fastorq**
(800) 231-1075
www.fastorq.com

**HD Electric Co.**
(847) 473-4980
www.hdelectriccompany.com

**HYTORC**
(800) 367-4986
www.hytorc.com

**INTEGRA Technologies**
(310) 606-0855
www.integratech.com

**ITH Bolting Technology**
(815) 363-4900
www.ith.com

**J&M Diamond Tool Corp.**
(401) 431-2220
www.diamondtool.com

**Jetyd Corporation**
(201) 343-4570
www.jetyd.com

**Jones Hydraulic Service**
(713) 674-9571
www.joneshydraulic.com

**McCann Equipment, Ltd.**
(800) 356-5624
www.torquetools.com

**Millennium Torque & Tensioning**
(724) 229-5020
www.milltorc.com

**Norbar Torque Tools, Inc.**
(866) 667-2272
www.norbar.com

**Norwolf Tool Works, Inc.**
(201) 666-6655
www.norwolf.com

**Ozzie's Padder, Inc.**
(480) 585-9400
www.ozzies.com

**Power Team-an SPX Brand**
(800) 541-1418
www.spx.com/en/power-team/

**RAD Torque Systems**
(800) 983-0044
www.radtorque.com

**Snap-On Industrial**
(877) 740-1900
www.snapon.com/industrial

**Stahlwille Tools N.A., Inc.**
(800) 695-2714
www.stahlwille.com

**Team Torque**
(888) 682-8675
www.teamtorque.com

**Tentec, Ltd.**
44 1215241990
www.tentec.net

**Titan Technologies International, Inc.**
(281) 689-0922
www.titanti.com

**TorcUP**
(888) 867-2871
www.torcup.com

**Torkworx LLC**
(888) 502-9679
www.torkworx.com

**Torqlite**
(713) 983-7171
www.torqlite.com

**Torque Tools California**
(213) 380-8049
www.torquetoolsca.com

**Transcat**
(800) 800-5001
www.transcat.com

**Ultra Torq Hydraulic Bolting**
(855) 400-7864
www.ultratorq.com

## TRANSFORMERS

**ABB, Inc.**
(800) 435-7365
www.abb.us

**CG Global**
(636) 239-9349
www.cgglobal.com/us

**Cooper Power Systems**
(877) 277-4636
www.cooperpower.com

**ERMCO**
(800) 238-5587
www.ermco-eci.com

**Fortune Electric Co., Ltd.**
(724) 346-2722
www.fortune.com.tw

**Global Power Supply**
(805) 683-3828
www.globalpwr.com

**Instrument Transformer Equipment Corp. (ITEC)**
(704) 282-4331
www.itec-ctvt.com

**MTC Transformers**
(276) 228-7943
www.scaffner.mtc.com

**Power Magnetics, Inc.**
(601) 695-1170
www.powermagneticsinc.com

**Powertronix**
(650) 345-6800
www.powertronix.com

**SPX Transformer Solutions, Inc.**
(800) 835-2732
www.spxtransformersolutions.com

**T&R Electric Supply Co., Inc.**
(800) 843-7994
www.trelectric.com

**Virginia Transformer Corp.**
(540) 345-9892
www.vatransformer.com

**WEG Electric Corp.**
(800) 275-4934
www.weg.net/us

**Weldy-Lamont Group**
(847) 398-4510
www.weldygroup.com

## TRANSMISSION TOWERS

**Bell Lumber & Pole**
(877) 633-4334
www.blpole.com

**Brooks Manufacturing Co.**
(360) 733-1700
www.brooksmfg.com

**DIS-TRAN**
(318) 448-0274
www.distran.com

**FWT, Inc.**
(800) 433-1816
www.fwtinc.com

**McFarland Cascade Co.**
(800) 426-8430
www.ldm.com

**Pelco Structural LLC**
(918) 283-4004
www.pelcostructural.com

**ReliaPOLE Solutions, Inc.**
(281) 259-7000
www.polesafety.com

**Sabre Industries**
(866) 254-3707
www.sabretubularstructures.com

**Valmont Newmark**
(402) 963-1000
www.valmont.com

### TRUCKING SERVICES

**American Transport, Inc.**
(412) 788-8878
www.thetii.com

**Anderson Haulage Limited**
(800) 387-4397
www.andersonhaulage.com

**ATS IWCs**
(800) 633-8287
www.atsiwc.com

**B&K Trucking**
(800) 661-0100
www.bk-trucking.com

**Badger Transport Systems**
(715) 823-5426
www.badgertransportinc.com

**Bennett Motor Express LLC**
(800) 866-5500
www.bennettig.com

**Big Freight Systems, Inc.**
(800) 665-0415
www.bigfreight.com

**Blitz Transportation Services**
(360) 426-4337
www.blitztransport.com

**Combined Transport, Inc.**
(800) 547-2870
www.combinedtransport.com

**E.W. Wylie Corporation**
(800) 437-4132
www.wylietrucking.com

**FTI/Bill Thompson Transport, Inc.**
(800) 733-8979
www.loadfti.com

**Great Lakes Heavy Haul**
(616) 530-1800
www.greatlakeshh.com

**Hard Rock Specialized LLC**
(601) 582-7133
www.hardrocksecurity.com

**JPW Riggers**
(315) 432-1111
www.jpwriggers.com

**Landstar**
(800) 872-9400
www.landstar.com

**LoneStar Transportation LLC**
(800) 541-8271
www.lonestar-llc.com

**McCoy Global**
(832) 303-7400
www.mccoyglobal.com

**Prairie Trailer**
(320) 589-1771
www.ptrailer.com

**The Waggoners Trucking**
(800) 999-9097
www.waggonerstrucking.com

**Thru-Way Trailers**
(903) 440-4286
www.thruwaytrailers.com

**Trans-United, Inc.**
(877) 762-3111
www.transunited.com

**Union Pacific Carrier Services**
(800) 877-5631
www.upds.com

**United Specialized Trailers**
(320) 894-0343
www.us-trailers.com

**Watson & Chalin Mfg.**
(800) 445-0736
www.watsonsuspensions.com

**W.I.S. Logistics**
(877) 947-0908
www.wislogistics.com

### WINDFARM DESIGN/MAPPING

**AWS Truepower LLC**
(518) 213-0044
www.awstruepower.com

**CADWRX.COM**
(817) 477-7496
www.cadwrx.com

**DAS Surveying & Mapping**
(214) 349-2200
www.dasmaps.com

**Emergent Energy Group LLC**
(617) 764-0206
www.emergentgroup.com

**Eurus Energy America**
(858) 638-7115
www.eurusenergy.com

**GAI Consultants, Inc.**
(412) 476-2000
www.gaiconsultants.com

**Mapmaker Photogrammetric Services**
(802) 524-3981
www.3dmapping.net

**Renewable Energy Systems Americas**
(303) 439-4200
www.res-americas.com

**ReSoft, Ltd.**
www.resoft.co.uk

**S. Nelson & Associates**
(770) 505-8566
www.s-nelson.com

**Tetra Tech**
(626) 351-4664
www.tetratech.com

**Westlake Consultants, Inc.**
(503) 684-0652
www.westlakeconsultants.com

**WSP Canada Inc.**
(514) 340-0046
www.wspgroup.com

### WIND RESOURCE FORECASTING/ ASSESSMENT

**3TIER**
(206) 325-1573
www.3tier.com

**AL-PRO GmbH & Co. KG**
+49 (0) 493669860
www.al-pro.de

**CEATI International, Inc.**
(514) 866-5377
www.ceati.com

**CPP**
(970) 221-3371
www.cppwind.com

**Dantec Dynamics, Inc.**
(631) 654-1290
www.dantecdynamics.com

**DNV GL**
(281) 396-1000
www.dnvusa.com

**EAPC Wind Energy Services**
(802) 649-1511
www.eapcwindenergy.com

**KB Energy Co.**
(307) 378-3480
www.kbenergy.com

**Kintech Engineering**
(305) 799-1019
www.kintech-engineering.com

**M.K. Ince & Associates, Ltd.**
(905) 628-0077
www.mkince.ca

**Otech Engineering**
(530) 757-2264

**The Renaissance Group**
(440) 256-2800
www.conservefirst.com

**Vermont Environmental Research Assoc., Inc. (VERA)**
(802) 244-7522
www.northeastwind.com

**WindSim Americas**
(407) 810-9463
www.windsim.com

### WIND SENSING EQUIPMENT

**Airmar Technology Corporation**
(803) 693-0777
www.airmartechnology.com

**Anemometry Specialists, Inc.**
(712) 200-2281
www.anemometry.com

**Arklay S. Richards Co., Inc.**
(617) 527-4385
www.asrichards.com

**Atmospheric Research & Technology**
(808) 329-1627
www.sodar.com

**Atmospheric Systems Corp.**
(661) 294-9621
www.minisodar.com

**Climatronics Corporation**
(631) 567-7300
www.climatronics.com

**Lufft USA**
(805) 963-7547
www.lufftusa.com

**Met One Instruments, Inc.**
(541) 471-7111
www.metone.com

**Renewable RG Systems**
(802) 482-2255
www.nrgsystems.com

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(303) 772-6825
www.remtechinc.com

**Scintec Corp.**
(303) 666-7000
www.scintec.com

**Sky Power International LLC**
(864) 843-4420
www.skypowerinternational.com

### WIRE/CABLE

**AFL**
(800) 235-3423
www.aflglobal.com

**Allcable**
(303) 295-0106
www.allcableco.com

**Allied Wire & Cable**
(800) 472-4655
www.awcwire.com

**Alpha Wire**
(800) 522-5742
www.alphawire.com

**American Wire Group**
(800) 342-7215
www.buyawg.com

**Border States Electric**
(800) 676-5834
www.borderstates.com

**Calvert Wire & Cable**
(800) 837-2668
www.calvertwire.com

**Cobra Wire & Cable, Inc.**
(215) 674-8773
www.cobrawire.com

**CSS International Corp.**
(201) 767-5755
www.cssic.com

**Dura-line**
(800) 847-7661
www.duraline.com

**Draka Cableteq U.S.A.**
(508) 520-1200
www.drakausa.com

**DSG-Canusa**
(800) 422-6872
www.dsgcanusa.com

**Dow Wire & Cable**
(800) 441-4369
www.dowinside.com

**ECS-Electrical Cable S upply, Ltd.**
(866) 218-2251
www.ecswire.com

**EECOL Electric**
(403) 253-1952
www.eecol.com

**FIS**
(800) 500-0347
www.fiberinstrumentsales.com

**General Cable**
(859) 572-8000
www.generalcable.com

**HELUKABEL Wire & Cable U.S.A., Inc.**
(847) 930-5118
www.helukabel.com

**HUBER+SUHNER, Inc.**
(866) 482-3778
www.hubersuhnerinc.com

**Karish Electronics**
(714) 516-1852
www.karishelectro.com

**Lapp USA**
(800) 774-3539
www.lappusa.com

**Lutze, Inc.**
(800) 447-2371
www.lutze.com

**Megger**
(800) 723-2861
www.meggercom

**Mid-State Supply Company LLC**
(800) 738-8300
www.midstatesupply.com

**Northwire, Inc.**
(800) 468-1516
www.northwire.com

**OFS Specialty Photonics**
(888) 342-3743
www.specialtyphotonics.com

**Paige Electric**
(908) 687-7810
www.paigeelectric.com

**Priority Wire & Cable, Inc.**
(800) 945-5542
www.prioritywire.com

**Reel-O-Matic**
(888) 873-4000
www.reelomatic.com

**Remee Products Corporation**
(800) 431-3864
www.remee.com

**Sonoco**
(800) 633-3962
www.sonoco.com/reels

**Southwire Company, LLC**
(770) 832-4242
www.southwire.com

**State Electric Supply Co.**
(800) 624-3417
www.stateelectric.com

**Synergy Cables U.S.A., Ltd.**
(770) 226-9898
www.synergycables.com

**The Okonite Co.**
(201) 825-0300
www.okonite.com

**The Valley Group-a Nexans Co.**
(203) 792-3444
www.nexans.us

**Trench Grader**
(870) 697-2226
www.trenchgrader.com

**WECS Electric Supply, Inc.**
(760) 251-0040
www.wecselectric.net

**Wesco Distribution, Inc.**
(412) 454-2200
www.wesco.com

# MAINTENANCE

### ALIGNMENT EQUIPMENT

**Alignment Supplies, Inc.**
(419) 887-5890
www.group.com

**LUDECA, Inc.**
(305) 591-8935
www.ludeca.com/wind

**Schaeffler Group U.S.A.**
(803) 548-8500
www.schaeffler.us

**Seiffert Industrial, Inc.**
(972) 671-9465
www.seiffertindustrial.com

**VibrAlign, Inc.**
(800) 394-3279
www.vibralign.com

### BLADE SERVICES

**Abilene High Lift**
800-588-5012
www.abilenehighlift.com

**BS Rotor Technic USA LLC**
(888) 447-6867
www.bs-rotorusa.com

**Complete Wind Corporation**
(519) 524-6226
www.completewind.com

**GD Energy Services**
(312) 576-0661
www.gdenergy.co

**GEV Wind Power**
+44 (0) 1482 3000640
www.gevwindpower.com

**HEATCON, Inc.**
(206) 575-0815
www.heatcon.com

**ITW Plexus**
(855) 851-6692
www.itwplexus.com

**Miles Fiberglass & Composites**
(503) 775-7755
www.milesfiberglass.com

**Power Climber Wind**
(877) 729-4631
www.powerclimberwind.com

**Rope Partner**
(831) 460-9448
www.ropepartner.com

**Ropeworks**
(775) 747-3377
www.ropeworks.com

**Sky Climber Wind Solutions**
(800) 255-4629
www.skyclimber.com

**Zuma Rope Access**
(760) 808-3910
www.zumaropeaccess.com

### CONDITION MONITORING/ ANALYSIS

**Azima DLI**
(206) 842-7656
www.azimadli.com

**ComRent International, LLC**
(410) 257-3000
www.comrent.com

**ESRG**
(855) 965-5963
www.esrgtech.com

**GE Measurement & Control**
(978) 437-1000
www.ge-mcs.com/wind

**M4 Wind Services, Inc.**
(562) 981-7797
www.m4windservices.com

**Ofil, Ltd.**
(888) 950-5557
www.ofilsystems.com

**SCADA Solutions, Inc.**
(760) 720-1115
www.scadasolutions.com

**Schenck Trebel Corp.**
(631) 242-4010
www.schenck-usa.com

**Sentient Science**
(888) 522- 8560
www.sentientscience.com

**Stork Materials Technology**
(888) STORK55
www.storksmt.com

### CONDITION MONITORING EQUIPMENT

**AeroBalancer-Rotor Balancing Tools & Service**
49 351 4188 0849
www.aerobalancer.de

**AeroTorque**
(330) 590-8105
www.aerotorque.com

**ALL-TEST Pro LLC**
(860) 399-4222
www.alltestpro.com

**Baumer, Ltd.**
(860) 621-2121
www.baumerelectric.com

**Firetrace**
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www.firetrace.com

**GasTOPS, Ltd.**
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www.gastops.com

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(800) 477-2506
www.geo-instruments.com

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www.gramjuhl.dk

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www.heartland-solutions.com

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(800) 441-8246
www.ifm.com

**IFOS**
(408) 565-9000
www.ifos.com

**LUDECA, Inc.**
(305) 591-8935
www.ludeca.com/wind

**Meggitt Sensing Systems**
(301) 330-8811
www.wilcoxon.com

**Mersen**
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www.mersen.com/en

**MGM Controls LLC**
(325) 583-2831
www.mgmcontrols.com

**National Instruments**
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www.ni.com

**New Avionics Corporation**
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www.newavionics.com

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www.pruftechnik.com

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www.sengenuity.com

**Siemens PLM**
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www.lmsintl.com

**Spectro, Inc**
(978) 486-0123
www.spectroinc.com

**The Switch Control & Converters**
+358 20 783 8200
www.theswitch.com

**Vibration Specialty Corp.**
(877) 698-0800
www.vib.com

**US Sensor Systems, Inc.**
(818) 435-4020
www.ussensorsystems.com

**Weber Sensors**
(770) 592-6630
www.captor.com

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**Abatix Corp.**
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**Airgas Safety**
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www.airgas.com

**Avanti Wind Systems, Inc.**
(262) 641-9101
www.avanti-online.com

**Capital Safety**
(800) 328-6146
www.capitalsafety.com

**Dakota Riggers & Tool Supply, Inc.**
(800) 888-1612
www.dakotariggers.com

**DEUS Rescue**
(866) 405-3461
www.deusrescue.com

**D2000 Safety, Inc.**
(800) 551-8763
www.d2000safety.com

**Elk River, Inc.**
(800) 633-3954
www.elkriver.com

**Essentra Components**
(800) 847-0486
www.essentracomponents.com

**Grainger**
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www.grainger.com

**Guardian Fall Protection**
(800) 466-6385
www.guardianfall.com

**Hailo LLC**
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www.hailo.us

**IBT, Inc**
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www.ibtinc.com

**Latchways, Inc.**
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**Midwest Unlimited**
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www.midwestunlimited.com

**Miller Fall Protection/ Sperian**
(800) 873-5242
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**MSA**
(800) 672-2222
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**Pacific Arborist Supplies**
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www.pacificarborist.com

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**Rescue Technology**
(800) 334-3368
www.rescuetech1.com

**SafeWorks, LLC**
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www.safeworks.com

**Safety Supply South**
(800) 522-8344
www.safetysupplysouth.com

**Sterling Rope Co.**
(800) 788--7673
www.sterlingrope.com

**Tech Products, Inc.**
(800) 221-1311
www.techproducts.com

**Tech Safety Lines**
(214) 987-4680
www.techsafetylines.com

**TES, Inc.**
(800) 327-4036
www.towergear.com

**Tractel, Inc.**
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**TUF-TUG Products**
(937) 299-1213
www.tuf-tug.com

**Zuma Rope Access**
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www.zumaropeaccess.com

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www.aerotorque.com

**Atlantic Bearing Services**
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wind.atlantic-bearing.com

**BAMCOR**
(216) 265-1100
www.bamcor.cc

**Bourn & Koch**
815-965-4013
www.bourn-koch.com

**Eickhoff Wind**
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www.eickoffwindenergy.com

**Field System Machining, Inc.**
(800) 789-2814
www.fieldsystems.com

**Gearbox Express**
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www.gearboxexpress.com

**Inpro/Seal**
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**Malloy Electric**
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**Milburn Engineering, Inc.**
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**Pamco Machine Works, Inc.**
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www.pamcomachine.com

**PBS Engineering**
(714) 534-6700
www.pbseng.com

**Wilson Machine Co., Ltd.**
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www.wilsonmachine.com

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www.apmspecialtyservices.com

**Delom Group**
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www.emsl.ca

**Evans Enterprises Wind Energy**
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**IPS-Litchfield**
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www.knelectric.com

**Magnetech Industrial Services**
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**Power Equipment Maintenance, Inc.**
(864) 375-9030
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**Shermco Industries**
(888) 743-7626
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**Sloan Electric**
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www.spiderstaging.com

**Test Equipment Distributors, LLC**
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**X-R-I Testing**
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www.xritesting.com

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**Avanti Wind Systems, Inc.**
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**Goracon Windpower Access Systems LP**
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www.goracon.de

**Tempest Group**
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**Genesis Lamp Corporation**
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www.genesislamp.com

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www.hugheyandphillips.com

**International Tower Lighting, LLC**
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**Laufer Wind**
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**P & R Technologies**
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**Pfannenberg**
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www.psi-repair.com

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**Hanes Supply, Inc.**
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www.hanessupply.com

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www.hypersizer.com

**LM Wind Power**
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www.lmwindpower.com

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**Kobelt Manufacturing Company, Ltd.**
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**Roemheld USA**
(636) 386-8022
www.roemheld-usa.com

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## COATINGS/ CHEMICALS

**American Polywater Corp.**
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www.polywater.com

**BASF Corporation**
(800) 526-1072
www2.basf.us

**Bergolin U.S.A.**
47 95 95 899 0
www.bergolin.de

**DSI Ventures, Inc.**
(903) 526-7577
www.dsiventures.com

**Henkel**
(800) 562-8483
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**ITW Futura Coatings**
(215) 855-8450
www.futuracoatings.com

**Mankiewicz Coatings LLC**
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www.bladerep.com

**Polymer Exploration Group, LLC**
www.icerelease.com

**Polytech Services Co.**
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www.polytechservicescorp.com

**Sika Corporation**
(800) 933-7452
www.usa.sika.com

**Thermion, Inc.**
(877) 884-3428
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www.cronsrud.com

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www.dustmuzzle.com

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**Exact Dispensing Systems**
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www.grievecorp.com

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www.wisoven.com

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(888) 364-3577
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www.prepregs.com

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**DIS-TRAN Wood Products**
(318) 448-0274
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www.jsp.com

**Knowlton Technologies LLC**
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www.knowlton-co.com

**McClarin Plastics, Inc.**
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**Milliken Tycor**
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tycor.milliken.com

**Molded Fiber Glass Companies**
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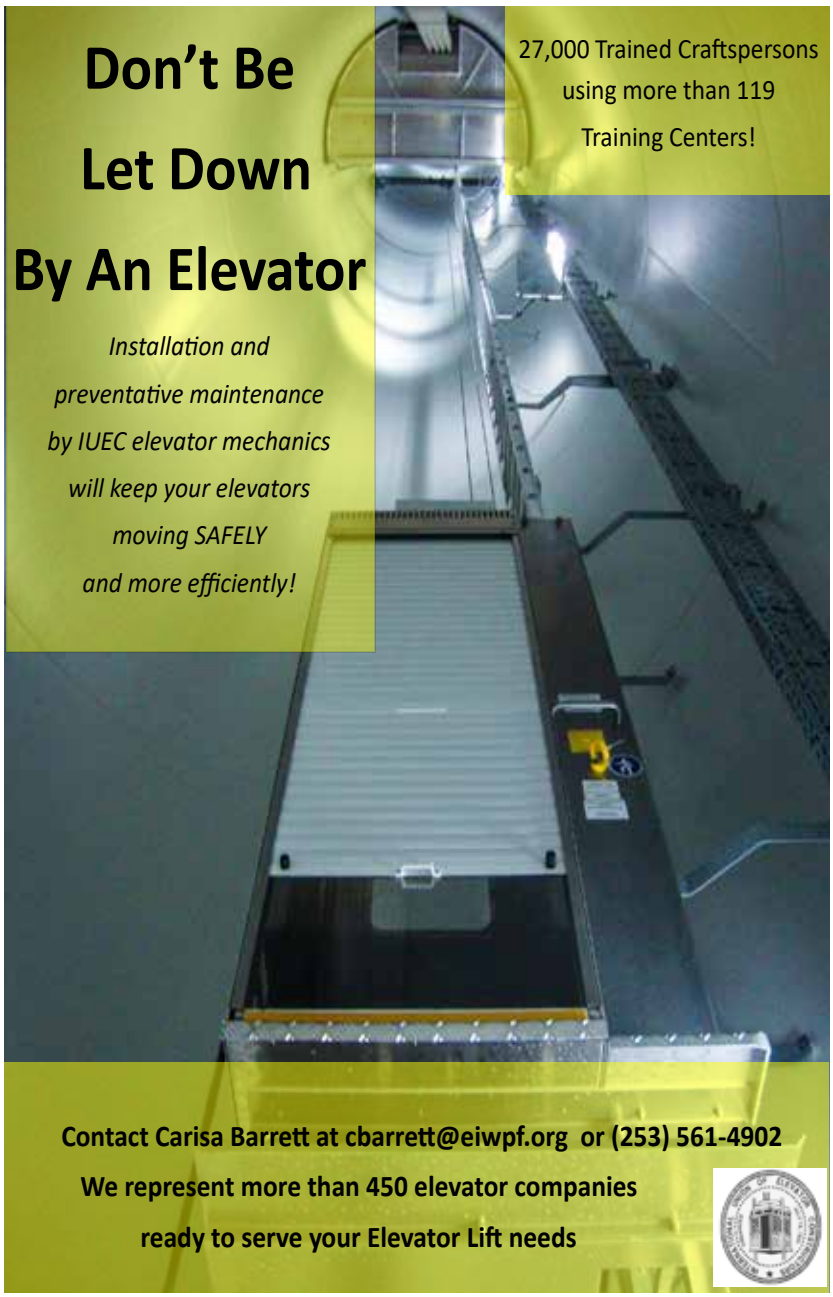

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# SMART MAINTENANCE AND WIND POWER

The mobile app supports operations in the field. (Courtesy: Mobility Work)

*Is it time to dare the leap from predictive to prescriptive maintenance and Industry 5.0?*

**By RALITSA PEYCHEVA**

Labeled as the "industries of the future," all renewable power generating sectors are highly appreciated. Onshore and especially offshore wind turbines are one of the most promising technologies to produce clean sustainable energy. According to Windeurope, wind power installed more than any other form of power generation in Europe in 2017. Onshore installations grew 14.3 percent while offshore grew 101 percent compared to 2016. In total, Europe installed 15,638 MW of new wind power capacity during 2017.

Despite the sector's booming development, the industrial maintenance of onshore and offshore wind turbines was and remains laborious and challenging, and reliability is a critical issue for operating wind-energy systems. All new wind turbines as well as the existing ones (about 486 GW in total) have to be operated and maintained carefully. According to recent studies, operation and maintenance (O&M) accounts for a share between 25 percent and almost 40 percent of levelized cost of energy (LCOE) [1]. The latest advances in mobile technology and the reduced cost of sensors and cloud-based data have encouraged the sector to deploy modern maintenance solutions.

Next-gen CMMS (computerized maintenance management system) is of a crucial importance for the proper O&M of a wind farm, reducing unscheduled maintenance interventions and reorganizing the placement of scheduled ones only in low wind-speed months. Since offshore maintenance is extremely expensive, many professionals have sought a solution into generating data across multiple wind farms to develop optimization plans.

Thanks to Industry 4.0 technologies such as CMMS, the Industrial Internet of Things (IIoT), and machine learning, the industry can improve and even solve current challenges. And for those who are ready to gain a competitive advantage, the Industry 5.0 is already knocking on the door, ready to introduce prescriptive maintenance based on cognitive analytics.

## LABORIOUS AND EXPENSIVE

Wind-turbine maintenance is mainly expensive because of the vehicles and vessels needed to access the remote locations of most wind farms. Additionally, weather conditions are not always favorable, and asset failures may result in long turbine downtime.

The size of the turbines doesn't necessarily ease the maintenance interventions. These are massive configurations with thousands of delicate moving parts; each intended to achieve maximum efficiency and requiring specific maintenance since even a simple wrong move can trigger a breakdown. Facing all these challenges, there are still companies that service turbines only when necessary. In the long term, this is actually the most expensive approach, leading to shorter asset life and countless unscheduled interventions.

However, many professionals are concerned that even traditional approaches with proven outcome as preventive maintenance didn't really reduce failures and unplanned downtime. Therefore, the sector is now increasingly incorporating IIoT and artificial-intelligence technologies to boost assets performance. Condition monitoring systems and predictive analytics are particularly appreciated when the occurrence of critical problems should be signaled.

> The wind-energy market generates tons of data and thus represents one of the most promising areas of industrial big-data application. The idea of smart maintenance is to store and analyze this data in order to be able to determine when maintenance should be performed on equipment assets.

In order to address the main maintenance problems of the sector as high costs and lack of historical data, the wind-power sector should target the establishment of an all-around lean maintenance program. The core of such a solution is a modern CMMS, tailored to the specific needs of the industry, flexible to evolve, and designed to connect to all ERP and sensor technologies.

Preventing failure instead of running tur-

bines until they break is the only way to minimize unplanned component failure leading to electricity stoppages. The deployment of a reliable CMMS is the first and most important step to be taken to control and forecast such failures.

## WHAT DOES SMART MAINTENANCE IMPLY?

The wind-energy market generates tons of data and thus represents one of the most promising areas of industrial big-data application. The idea of smart maintenance is to store and analyze this data in order to be able to determine when maintenance should be performed on equipment assets. The means of smart maintenance include all possible latest Industry 4.0 induced maintenance tools. In general, smart maintenance should result in:

- Prolonged assets life.
- Increased return on the assets.
- Streamlined maintenance.

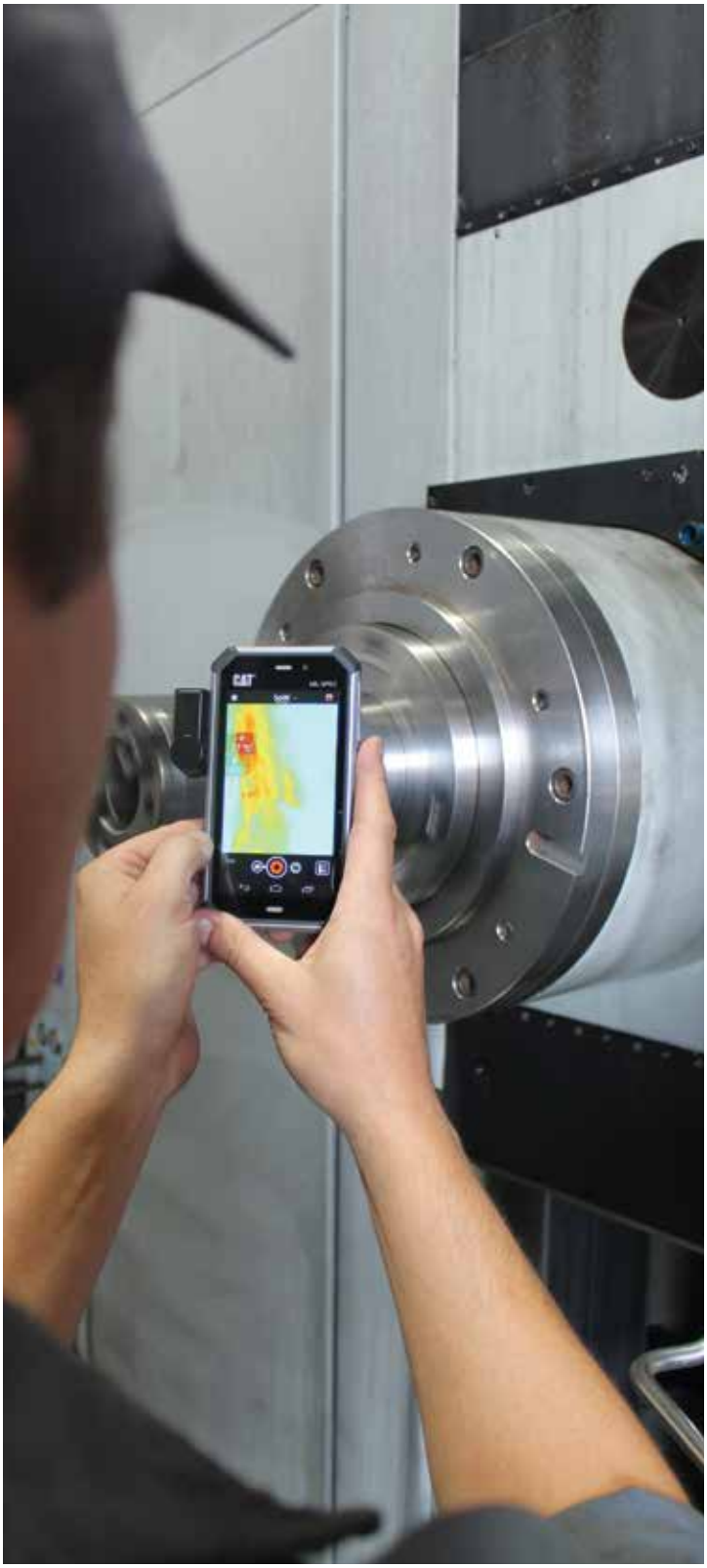
The arising challenge is how to get and analyze this data in a way that will allow you to act fast and easy in real time. Sensors mounted on the equipment are definitely an option. A next-gen CMMS will store and analyze this data in the context of other important information as intervention history, spare parts, other readings, and many more. A proper solution should also offer you the opportunity to receive notifications, 24/7 updates, and, of course, to geolocate a wind turbine.

## THE NEXT-GEN CMMS AS A DIGITALW HUB

A next-gen CMMS is an Industry 4.0 solution featuring an all-around maintenance program that promotes efficiency, safety, and asset optimization. This is the digital hub of the factory, streamlining maintenance tasks but also connecting employees, sensors, and ERP tools to collect, store, and analyze equipment data. All resources can simultaneously collaborate via the CMMS to solve critical problems, mitigate failures, and act fast.

The modern CMMS is mobile and accessible anytime and anywhere. Besides planning, newsfeed, search functions, and intervention records, a solution adapted to the needs of the wind-power sector should absolutely feature an elaborated geolocation tool. For maintenance professionals, it is of critical importance to geolocate fast and easy the wind turbine they need to work on and to enter the details of the maintenance tasks they perform.

The main goal of deploying a next-gen CMMS




The mobile CMMS eases maintenance interventions. (Courtesy: Mobility Work)

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- Blades.
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Predicting failures on these components through condition-monitoring data will increase your ROI and help you plan your investment strategy toward repowering and retrofitting. All this will result in known benefits as extended assets life, optimized inventory, and employees' schedule and cost efficiency because of the prevention of unplanned expensive downtimes.

However, the predictive maintenance approach has reached some limits in the context of the wind-power generation sector. Based on the sensor data, the system will notify the team via the CMMS when a certain reading has breached predefined limits. The first problem is the fact that usually only the most critical assets are monitored and the second is the sensor's abnormal behavior within the control thresholds. And even though predictive maintenance might work very well, marine renewable engineers continue to explore the capabilities of the Industrial Internet of Things and cognitive analytics.

The deployment of a next-gen, flexible SaaS CMMS, machine learning, and cloud computing gives companies the opportunity to move beyond preventive and predictive maintenance and reach to prescriptive maintenance.

## MAKING A STEP TOWARD INDUSTRY 5.0

The idea of prescriptive maintenance is, by connecting assets and feeding information into a central system, to find out how the values of certain assets should be adjusted in order to optimize the performance of other assets. After the failure of a piece of equipment has been anticipated, a solution can be prescribed in order to slow down the failure and reveal whether planned production requirements can still be met.

This is a new maintenance approach that will still require some implementation time. At first, companies should develop a set of recommendations to carry out when specific changes in asset health are identified. These recommendations can be based on the data gathered in the CMMS, including equipment documents, behavior records, failure tracking, and more. This will help the maintenance team to make the right decision when a problem has been encountered.

For example, if a wind turbine fails, a certain condition-monitoring data is produced so it can help to anticipate similar events in order to mitigate their occurrence in the future. In this case, it depends on which data you would like to take into account, which turbine's components should be monitored, and how often preventive actions should be executed, according to you. With prescriptive analytics, a software is analyzing all possible data related to the asset: parts' behavior, but also proximity to cities and construction sites, accident reports, and more. In the end, the program is prescribing you the best "remedy" that can suggest the frequency of maintenance interventions, reducing or maximizing certain metrics, the exchange of a blade, etc.

The real-time wind-farm optimization via Big Data is not a dream anymore. Costly unplanned maintenance can be significantly minimized with the help of the Industrial Internet of Things and Industry 4.0. A smart CMMS will help business owners forecast failures and in the same time ensure production schedules are met, environmental standards are in compliance, and customer demands are satisfied.

2017 annual combined onshore and offshore wind-energy statistics. (Courtesy: Windeurope, Wind in Power)

And for all those leaders who would like to gain a competitive advantage, prescriptive analytics bring wind-turbine maintenance to the next level. As the Internet of Things continues to expand, artificial intelligence is about to become a reality in the renewable energy sector.

### REFERENCES

1) Performance and Reliability of Wind Turbines: A Review Sebastian Pfaffel, Stefan Faulstich and Kurt Rohrig; Fraunhofer Institute for Wind Energy and Energy System Technology.

### ABOUT THE AUTHOR

Ralitsa Peycheva is a technical content manager at Mobility Work (www.mobility-work.com). He is interested in latest machinery tools, technical maintenance, CMMS, and Big Data. Peycheva is curious about new manufacturing methods, as well as discovering, observing, and admiring high-quality engineering.

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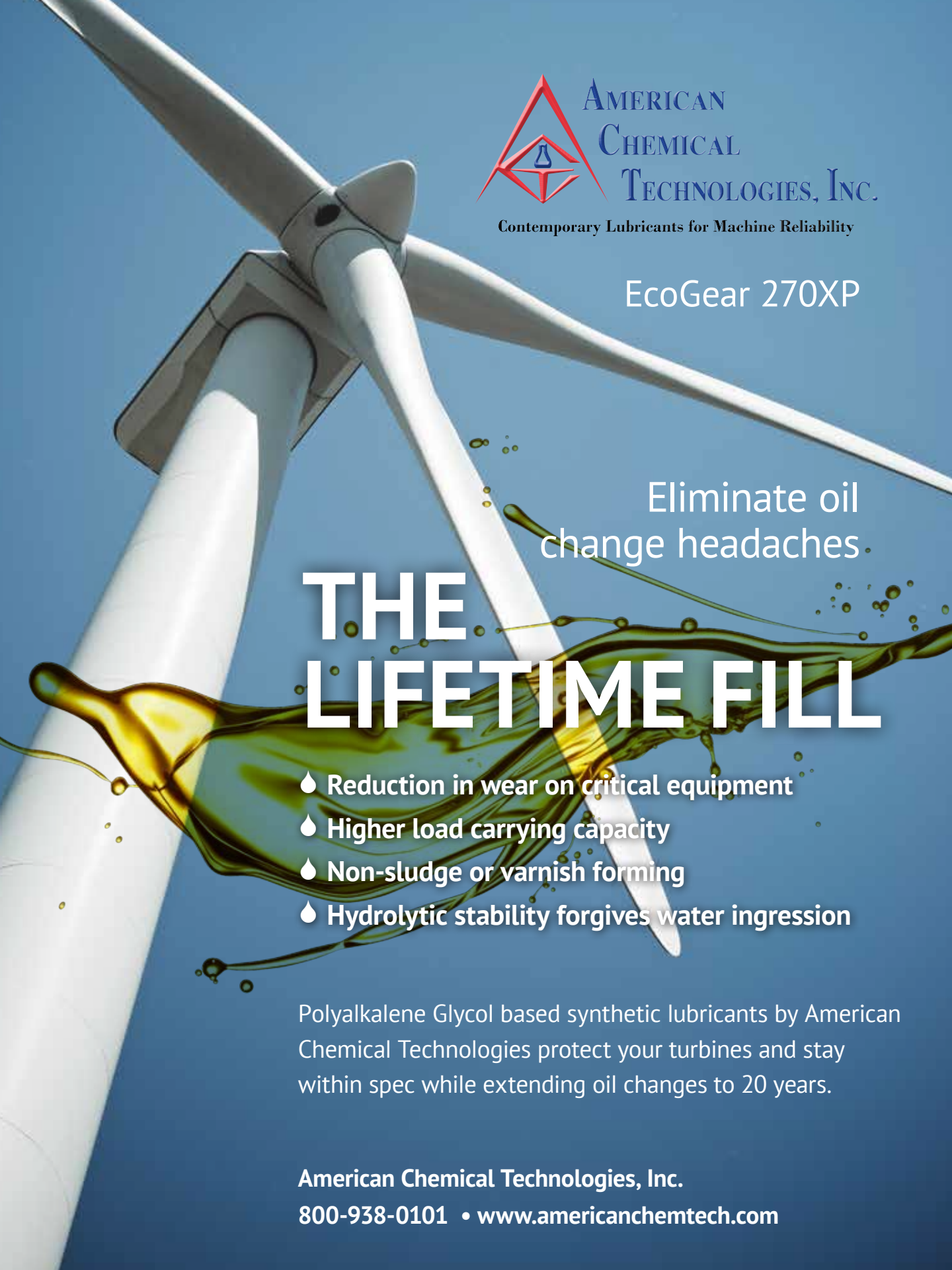
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