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AMERICAN WIND ENERGY GENERATION OFF TO A GOOD START IN 2016



According to the American Wind Energy Association (AWEA), the American wind power industry had its most productive first quarter for installations since 2012 as demand rises for wind's low-cost, zero-carbon energy.

Wind added 520 MW of new electric generating capacity to the power grid from January through March, according to AWEA's U.S. Wind Industry First Quarter 2016 Market Report. Construction started on another 2,000 MW, with a total of more than 10,100 MW of wind capacity now under construction.

"Our productive first quarter reflects the strength of American wind power entering 2016. We have a low-cost product that's in high demand," said Tom Kiernan, CEO of AWEA. "As the wind business builds momentum, we're prepared to double wind's contribution to America's electricity supply in the next five years."

There are now more than 48,800 wind turbines operating in 40 states plus Puerto Rico and, for the first time, Guam. This is enough to power 20 million average homes with 74,512 MW of total installed capacity. Turbines were installed at seven projects across six states this quarter. Oklahoma led the country with 270 MW of wind capacity installations, followed by Iowa (154 MW), Utah (62 MW), and New Mexico (32 MW).

According to AWEA, more wind power is on the way. Construction starts in the first quarter, bringing the total to 10,100 MW now under construction with an additional 5,100 MW in advanced stages of development and nearing construction.

Texas remains the leader for total installed capacity and reported construction activity, and it accounted for over 54 percent of construction underway during the first quarter. The Plains region of Oklahoma, Kansas, and Nebraska came next

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with 18 percent of construction activity, followed by the Midwest at 12 percent.

The Department of Energy (DOE) Wind Vision report shows that wind power can double in the next five years to supply 10 percent of U.S. electricity demand by 2020 and double again to reach 20 percent by 2030.

The newest quarterly market results follow the release of AWEA's 2015 U.S. Wind Industry Annual Market Report, which highlights the growing demand for wind energy in 2015. The cost of wind power has fallen by two-thirds since 2009, helping to make wind energy the electricity source of choice for American states, utilities, and other emerging buyers. Last year, wind installed the most new electric generating capacity nationwide at 41 percent, followed by solar at 28.5 percent and natural gas at 28.1 percent.

Low costs have prompted strong growth in wind investment by Fortune 500 companies and other emerging buyers through long-term power purchase agreements (PPAs). The Department of Defense joined Fortune 500 companies 3M and Salesforce, among others, to contract for 246 MW of wind in the first quarter, over a third of the capacity purchased in 2016's first three months.

Including traditional utility buyers, more than 660 MW of PPAs were announced during the first quarter of 2016, contributing to more than 4,500 MW of PPAs signed since the beginning of 2015.

Project developers and manufacturers are also investing in new technology to produce turbines that reach steadier, more powerful winds at greater heights, opening new areas to be developed economically. America's tallest operating wind turbine can now be found in Iowa. The 154-MW Adams wind farm, completed in the first quarter by MidAmerican Energy, includes one prototype wind turbine — designed and supplied by Siemens — that uses an innovative concrete tower design to reach a record-breaking hub height of approximately 115 meters with a rotor diameter of 108 meters.

"This is the first concrete tower project for Siemens in North America, we're proud to say the tower technology was conceived, designed, engineered, and constructed entirely in the U.S.," said Michael McManus, head of business development and strategy for Siemens Americas Onshore Wind. "This project marks another milestone in our successful partnership with MidAmerican Energy to expand clean, renewable wind power in Iowa and demonstrates Siemens' continuous dedication to innovation to drive down the cost of wind energy around the globe."

Turbine manufacturers reported over 800 MW of new orders in the first quarter. The wind industry supported 88,000 jobs in the U.S. at the start of the year — an increase of 20 percent from 2014 — including over 21,000 jobs in manufacturing wind turbine parts and materials at more than 500 factories across 43 states.

Many states and utilities are moving forward with their plans to cut carbon pollution despite the Supreme Court stay of EPA's Clean Power Plan. Wind energy is the biggest, fastest, and cheapest way for states to cut carbon pollution and comply with the plan, according to analysis of EIA data, and states that add wind energy now can benefit from increases in jobs and consumer savings ahead of the initial Clean Power Plan compliance period in 2022.

Building long-distance transmission infrastructure is another key part of America's clean energy future. Adding transmission capacity helps move low-cost wind energy to cities where it's needed most, saving consumers money and increasing the resilience of the electricity grid. Working with local authorities to develop clear siting laws is also vital to making sure that wind projects can be sited efficiently and to the benefit of local communities. ↴

Source: AWEA

For more information, go to www.awea.org.

NREL DISTRIBUTES FOURTH ROUND OF FUNDING FOR COMPETITIVENESS IMPROVEMENT PROJECT

The United States Department of Energy (DOE) National Renewable Energy Laboratory (NREL) is awarding four subcontracts under the fourth round of funding through DOE's Distributed Wind Competitiveness Improvement Project (CIP).

The CIP aims to help manufacturers of small- and mid-size wind turbines improve their turbine design and manufacturing processes while reducing costs and improving efficiency as they work toward certification. Certification for these turbines is important because it demonstrates to consumers that they meet performance and safety requirements.

The DOE Wind and Water Power Program sponsors the CIP as part of its multifaceted wind energy research portfolio to help the U.S. wind industry develop competitive, high-performance technology for domestic and global energy markets. NREL implements all CIP awards, provides technical oversight of awards, and supplies technical assistance to CIP awardees during the technology advancement or certification process.

Two awardees were selected in the certification testing category, which is dedicated to turbines with a rotor-swept area less than 200 square meters. Primus Wind Power

Inc. of Lakewood, Colorado, will receive \$150,000 in funding to conduct certification testing on its 400-watt AIR30 model turbine. Bergey Windpower of Norman, Oklahoma, received an award for \$152,558 to conduct certification testing of the Bergey Excel 15 turbine.

Certification testing for wind turbines is conducted to either the International Electrotechnical Commission (IEC) standard or the American Wind Energy Association (AWEA) small wind turbine performance and safety standard. These certifications include power performance, acoustic emissions, safety and function, and duration tests. A design review of the structural components is also conducted.

Two awardees were selected in the type certification category, which is dedicated to turbines with rotor-swept areas between 200 and 1,000 square



The Distributed Wind Energy Association (DWEA)

meters. Northern Power Systems of Barre, Vermont, will receive \$447,000 to conduct type certification testing on its NPS100-24/37m IEC Class IIIA model wind turbine. The second awardee, Endurance Wind Power Inc. of Seattle, Washington, will receive \$450,000 to conduct type certification testing on its model X35 225-kilowatt wind turbine.

Type certification for wind turbines in this category is conducted to

the IEC standard. This certification begins with a rigorous design review and issuing a design certificate. Type testing and component tests are also required for the issuing of type certification. Type testing includes safety and function test, power performance test, load measurements, acoustic noise test, and blade test.

The awardees will complete their projects within an 18-month period of performance. With the announce-

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ment of the four new subcontract awards, NREL has awarded CIP funding to 16 subcontracts through this DOE program. The previous recipients of subcontracts in the first three rounds of funding were:

- Round 1: Bergey Windpower for component improvements and overall system optimization and Pika Energy (manufacturing process upgrades)
- Round 2: Endurance Wind Power (prototype testing), Northern Power Systems (component improvements and overall system optimization), Pika Energy (component improvements and overall system optimization and manufacturing process upgrades), and

Urban Green Energy (certification testing)

- Round 3: Intergrid (component improvements and overall system optimization), Pika Energy (component improvements and overall system optimization), Primus Windpower (certification testing), Ventera Wind (Certification Testing), and Wetzel Engineering (component improvements and overall system optimization) ↵

Source: NREL

For more information, go to www.nrel.gov.

ENBRIDGE TO ACQUIRE 50-PERCENT INTEREST IN FRENCH OFFSHORE WIND DEVELOPMENT COMPANY

Enbridge Inc. recently announced it has agreed to acquire a 50-percent interest in Éolien Maritime France SAS (EMF), a French offshore wind development company, for an investment of \$282 million inclusive of transaction costs and past and future pre-final investment decision (FID) development costs. EMF will be co-owned with EDF Energies Nouvelles (EDF EN), a subsidiary of Électricité de France S.A. (EDF) dedicated to renewable energy.

Enbridge and EDF EN will co-develop three large-scale offshore wind farms off the coast of France that will produce a combined 1,428 MW of power. Development of the three projects is already underway, however, construction is subject to FID and regulatory approvals.

“This is a unique and strategic opportunity for Enbridge to further grow our investment in renewable power and build on our existing presence in European offshore wind generation,” said Al Monaco, president and CEO of Enbridge. “This investment in EMF advances our priority to build new business platforms that will extend and diversify growth. The EMF development opportunities are underpinned by strong market fundamentals and a commercial framework that is well-aligned with our low-risk business model. Once fully operational, they are expected to generate attractive returns and accretion to available cash flow from operations.”

Each of the three wind projects has been awarded a 20-year power purchase agreement (PPA) pursuant to which EDF, the power off-taker under the PPAs, will pay an indexed fixed price for 100 percent of the power generated by each facility, through which EMF will also be significantly insulated from variances in wind capacity. These three projects are in an advanced stage of development with a permitting process close to completion, as well as significant technical and environmental studies already performed. Front-end engineering and design have been completed, construction contracts have been tendered, and bids have been received.

The following are the three projects under development by EMF:

1. 498-MW Eoliennes Offshore des Hautes Falaises offshore wind farm located off the coast of Fecamp, France
2. 450-MW Eoliennes Offshore du Calvados project located off the coast of Courseulles-sur-Mer, France
3. 480-MW Parc du Banc de Guerande project located off the coast of Saint-Nazaire, France

Subject to Enbridge taking positive FID on each project individually, it would potentially invest up to \$4.5 billion in total for all three projects. Should the projects achieve FID, construction would start gradually from 2017 and continue on through the next five years through 2022.

The initial investment in EMF was included in Enbridge’s secured growth program and will be funded from available liquidity. No incremental equity funding will be required. The incremental equity and debt required to construct the projects will be sourced once FIDs have been made. EMF is pursuing non-recourse project-debt financing for the debt component of the investment.

Enbridge is the co-owner, along with EDF Energies Nouvelles’ Group, of four operating onshore wind projects in North America.

Enbridge has interests in 24 renewable energy facilities that are either operating, secured, or under construction with a net generating operating capacity of nearly 2,000 MW. The projects in operation produce enough gross power to supply power to more than 750,000 homes. During the past decade, Enbridge has invested nearly \$5 billion in renewable power generation and transmission. ↵

Source: Enbridge

For more information, go to www.enbridge.com.