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DNV GL: A cleaner, more electrified world is within reach by 2050



An era of abundant and cleaner energy lies ahead, according to DNV GL's modeling of the world energy system. (Courtesy: DNV GL)

DNV GL recently published its first Energy Transition Outlook (ETO): Renewables, Power and Energy Use. The industry implication report is part of DNV GL's new suite of Energy Transition Outlook publications. The report reviews global energy demand and energy supply and summarizes the implications for the power and renewables sector and large industrial energy users.

An era of abundant and cleaner energy lies ahead, according to DNV GL's modeling of the world energy system. The key findings of the report emerging globally over the forecasting period include:

- Electricity consumption increases by 140 percent by 2050, becoming the largest energy carrier, followed by gas. Other energy carriers such as coal experience significant reductions, while oil and gas consumption increase only slightly.
- 85 percent of global electricity production in 2050 comes from renewable sources — Solar PV will provide around a third of the world's electricity by 2050,

followed by onshore wind, hydropower, and offshore wind, in that order.

Despite this optimistic outlook, the report finds that the world is not on course to achieve the climate objectives of the Paris agreement.

DNV GL forecasts that humanity will exhaust the 2 degrees C carbon budget (the amount of CO₂ that can be emitted without triggering dangerous climate change) by 2041, pointing toward a global warming of 2.5 degrees C above pre-industrial levels by the end of the century, a level which is likely to force dangerous climate change.

The growth of electricity consumption is one enabler to speed up the global decarbonization. This includes the rapid uptake of electric vehicles, generating energy savings and emissions reductions. DNV GL forecasts that electric vehicles will achieve cost parity with internal combustion vehicles in 2022 and, by 2033, half of new light vehicle sales globally will be electric.

“Our report shows that the energy industry, more than any other, has the power and knowledge to manage the world's carbon budget in a smarter way,” said Ditlev Engel, CEO at DNV GL-Energy. “Until 2050, the electricity share of energy demand will grow from 18 percent to 40 percent, yet this transformation is not happening fast enough. Speeding up the acceleration by decarbonization of heat and transport will be one vital measure to put the brakes on global warming. In fact, all industries should maximize the decarbonization of their operations. But the climate challenge is not only an engineering challenge, but also one of governance. We call upon all stakeholders to maximize the decarbonization of their operations.”

To achieve the target of a low-carbon world, there is no single solution. Instead, multiple achievable actions must be taken both locally and globally, involving collaboration within the energy sector and across industries:

Action 1: Greater and earlier adoption of renewables.

- Assist the growth of offshore wind.
- Drive uptake of data analysis to optimize performance of wind, solar, grids, and energy use.
- Invest in testing and verification of systems to secure robust electricity supply.
- Provide flexibility, balancing, and cost-effective integration solutions.
- Optimize grids to facilitate growth of renewables.

Action 2: Greater and earlier electrification of heat and transport.

- Drive the uptake of decarbonization of heat.
- Broader adoption of electric vehicles contributing to energy savings and emissions reduction.

Action 3: Greater improvements in energy efficiency.

- Invest in strategic energy management.

Action 4: Change in personal behavior.

- Increase the level of public acceptance to shape consumer behavior.
- Availability of subsidies.

DNV GL's ETO report was prepared by a dedicated research team, which received input from hundreds of energy experts from inside and outside the organization.

The report arms all relevant sectors with a wealth of factual ammunition to adapt strategies, and be bold in making evidence-based decisions to transform energy systems. ↘

Source: DNV GL

For more information, go to eto.dnvgl.com/2017/download



Money donated by the wind industry will support repairs and rebuilding efforts in areas affected by Hurricane Harvey, which first made landfall August 25 near Corpus Christi, Texas. (Courtesy: NOAA)

American wind companies pledge \$1 million for post-Harvey recovery

Companies in the American wind-energy industry recently announced they will donate \$1 million to Hurricane Harvey repair and rebuilding as keystone partners of Habitat for Humanity's Habitat Hammers Back initiative.

Participating companies include Apex Clean Energy, Blattner Energy, Duke Energy, EDF Renewable Energy, EDP Renewables, Enel Green Power North America, Inc., E.ON, Goldwind Americas, Hannon Armstrong, Invenegy, Leeward Renewable Energy, MAP Royalty, Pattern Energy, TPI Composites, and the American Wind Energy Association.

The money will support repairs and rebuilding efforts in areas affected by the storm, which first made landfall August 25 near Corpus Christi, Texas. The wind companies had also planned to send volunteers to help with the rebuilding effort. Texas has a quarter of U.S. wind-power capacity and more than 22,000 Texans work in the industry, among 102,500 wind jobs nationwide. The state's more than 12,000 wind turbines themselves emerged unscathed from the storm.

"The EDF group has 400 employees in Houston serving various sectors of the energy industry, including our regional wind-project development team," said Tristan Grimbert, president and CEO of EDF Renewable Energy. "As Texas wind is an important contributor to our nation's energy mix, and Houston in specific is the center of energy diversity, we are committed to the ambition to offer our resources in the recovery and rebuilding efforts."

"Our thoughts and prayers continue to go out to everyone along the Texas Coastal Bend and in Houston who was impacted by this storm," said Patrick

Woodson, chairman of E.ON North America. “Several E.ON employees around our Papalote Creek Wind Farm lost their homes, and even more saw their communities devastated when the hurricane made landfall. Habitat for Humanity will play a critical role in helping people rebuild their homes and communities. With Texas as the nation’s leader in wind energy, it is only right that we and the wind industry be a leading force to help Texans rebuild and recover.”

“More than 22,000 wind workers are in the state of Texas, so this has hit very close to home for us,” said Steven C. Lockard, president and CEO of TPI Composites. “We all feel the need to help with this rebuilding effort. I am especially proud participating companies from across the United States and their associates are committed to volunteer their time in addition to financial resources.”

“Habitat for Humanity is committed to helping families recover from Hurricane Harvey, and we wouldn’t

be able to do it without the support of our partners like these American wind-energy companies,” said Habitat for Humanity International CEO Jonathan Reckford. “Their gift is an investment in the long-term recovery of these communities.”

Habitat is already at work responding to Hurricane Harvey, helping families clean up and prepare for the rebuilding effort to come. Habitat will work with its local offices throughout the hurricane-affected regions to assess the shelter and housing needs and develop response options. In addition to long-term housing repair and construction, Habitat’s response includes organizing volunteers and resources to help with the cleanup of homes damaged by wind and flood waters. ↵

Source: American Wind Energy Association

For more information on Habitat for Humanity and American Wind Rebuilding Texas hurricane response program, go to habitat.org/American-Wind-Energy/Harvey

Gearbox Express signs framework agreement with Eickhoff Bochum

Gearbox Express (GBX), the only independent company in North America focused on providing down-tower, multi-brand wind gearbox remanufacturing services, recently announced it has signed a framework agreement with Eickhoff Bochum to become its preferred North American partner for all up- and down-tower service both in and out of warranty, parts supply, and new replacement gearboxes.

“Currently, Eickhoff has more than 800 wind-turbine gearboxes in service in North America, and this partnership gives Eickhoff much needed service capabilities,” said Bruce Neumiller, CEO of Gearbox Express. “Gearbox Express will serve as their North American service and repair partner, ensuring the Eickhoff gearboxes keep running. We look forward to working together as partners for many years to come.”

Eickhoff has been in the gearbox business since 1864, and takes the care and maintenance of their product seriously.

“We had to prove our capabilities to handle the work,” Neumiller said.



Gearbox Express will become the preferred North American partner for all up- and down-tower service both in and out of warranty, parts supply, and new replacement gearboxes for Eickhoff Bochum. (Courtesy: Gearbox Express)

“The GBX team is highly trained; our equipment and parts are state of the art, and our quality of service sets the industry standard.”

The collaboration is in line with Eickhoff Bochum’s strategic goal to provide service all around the globe.

“We are looking back on many years of cooperation with GBX and value them as a reliable and experienced partner,” said Christi-

na Gierga, head of service at Eickhoff Bochum. “The official collaboration is a logical step toward our goal of meeting the needs of our customers in the USA with high quality standards and OEM spares made by Eickhoff.” ↵

Source: Gearbox Express

For more information, go to gearboxexpress.com



The SWT-2.3-108 model turbine will be used to upgrade two Texas wind farms. (Courtesy: Siemens Gamesa)

Siemens Gamesa to repower two Texas wind farms

Siemens Gamesa Renewable Energy (SGRE) has been selected by NextEra Energy Resources to repower two wind farms in Texas. The newly repowered wind farms are expected to deliver up to 25 percent more annual energy production, boost reliability and efficiency, and extend service life.

The two wind farms feature Siemens SWT-2.3-93 model turbines. The repowering program will upgrade them to the SWT-2.3-108 model. Project completion is expected by year-end, and the wind farms will remain operational during the repowering process.

“We are very pleased to continue our work with NextEra Energy Resources,” said Jacob Andersen, head of Onshore North America for Siemens Gamesa Renewable Energy. “Through Siemens Gamesa’s repowering program, we’re making it possible to optimize our customers’ assets and extend their service life — maximizing the value of their investments.”

Harnessing its expertise in both turbine technology and turbine operation and maintenance services, SGRE has developed a comprehensive and customizable repowering program. The program offers solutions in all phases of a repowering project including siting guidance, financing, planning, construction, service, and operation. SGRE further offers a turbine overhaul option designed to upgrade the electrical and electronic components of wind turbines from other turbine suppliers, improving performance and increasing energy production.

“Siemens Gamesa is a valuable partner, and we look forward to working with them on these important projects,” said Armando Pimentel, president and CEO of NextEra Energy Resources. *Λ*

Source: Siemens Gamesa

For more information, go to www.gamesacorp.com/siemensgamesa

ZF Wind Power puts wind energy in motion

Merging ZF’s extensive experience in developing innovative designs with advanced digital technology, results in a modular gearbox solution approach for geared wind turbines.

With more than 55,000 gearboxes shipped, ZF’s installed base exceeds 100 GW covering 25 percent of the globally installed base. This makes the company a leading partner in the wind-power sector.

ZF powers more than 50 percent of the global 3-MW onshore installations and is the first supplier with a serial production of more than 8-MW gearboxes for offshore installation. A 9.5-MW upgrade is being developed.

ZF Wind Power officials said they are convinced that in the future wind energy will become even more pivotal than it is today. “We will need bigger, better, and more powerful turbines to provide the world with affordable electricity.”

ZF’S MODULAR GEARBOX SOLUTION

“With the development of our modular gearbox solution, ZF can now cover new turbine platforms in the 3- and 4-MW range,” said Jan Willem Ruinemans, head of ZF Wind Power Business Unit. “We assure that new generation wind turbines can grow significantly in torque requirements,

“ We are very pleased to continue our work with NextEra Energy Resources. ”

within the same nacelle dimensions. And thanks to our integrated intelligent performance solutions, our gearboxes can automatically sense the best way to optimize energy generation and improve turbine economics for any wind-site condition.”

SERVICE FOR WIND ENERGY IN MOTION

ZF offers a strong, global partnership and enhanced multi-brand full service for wind turbine gearboxes and drivelines, enabling its customers to successfully stand ground amongst the competition.

“Our full offering combining on-site, ZF and non-ZF mechanical drive-train repair, and insight engineering partnership is fundamental in leveraging our global knowledge base to reduce costs and down-times,” said Antti Turunen, head of Global Wind Power Service. “As a further evolution in service,



(Courtesy: ZF)

ZF sees an important role for connected devices to actively control gearbox performance and health status during operation. As part of this vision, ZF offers an intelligent

gearbox retrofit as a new method to reduce service bills.”

Source: ZF Wind Power

For more information, go to www.zf.com

Siemens Gamesa names new chief cyber security officer

Siemens Gamesa Renewable Energy has appointed Alan Feeley as its new chief cyber security officer. In addition to his current responsibilities as chief information officer, he will expand and manage the company’s operational framework for cyber security and will consolidate all security developments in the context of the digital transformation of SGRE after the merger of Gamesa and Siemens Wind Power. In this role, Feeley will work closely with the technology and product security departments, corporate security, and HR.

Cyber security vulnerabilities and threats present tangible risks and challenges to companies and to the operations they support for their customers. The complexity of this topic requires coordination and orchestration across many parts of large companies, including IT, product design, security, and data protection, to name a few.

Siemens Gamesa helps its customers to take advantage of technology advancements while simultaneously minimizing exposure to risk. An optimal security solution can only be implemented if it is continuously adapted to new threats. With the new position, Siemens Gamesa has implemented cyber security in its



Chief Information Officer Alan Feeley takes over additional role. (Courtesy: Siemens Gamesa)

top management to be prepared for future challenges and to address any potential security issues both internally as well as for its customers.”

Source: Siemens Gamesa

For more information, go to www.gamesacorp.com/siemensgamesa