

INNOVATION

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GE OPTIMIZATION SERVICE TARGETS WIND FARM EFFICIENCY

Wind Collector boasts faster system design, reduced system costs



When planning a wind plant, collector cable systems play a critical role in how efficiently power can be delivered from the point of generation to the grid. An optimal collector system design can help minimize electrical losses, cable and trenching costs and substation configuration costs. The new Wind Collector Optimization Service from GE's Digital Energy business uses grid intelligence to help utilities, developers and contractors better plan the layout of their wind farm by providing an in-depth look at possible collector cable configurations and the benefits and drawbacks of each. With this information, system design can be optimized to reduce start-up costs and improve operational efficiency.

Traditional manual collector cable design processes can be labor intensive, hard to adjust and can have long lead times. The result is a time-consuming, costly, non-optimized design with little flexibility to change the project after implementation has begun. GE's new service provides customers with a collector system design that optimizes cable routing and sizing and addresses the challenges associated with traditional design methods. It provides customers in the wind renewable energy segment with a comprehensive optimization service — from initial consultation to a completed and validated design. The Wind Collector Optimization Service incorporates GE's extensive experience in bringing over 4,000 MW of renewable energy online and more than 40 years of substation engineering, procurement, and construction expertise.

"With our new Wind Collector Optimization Service, we meet with customers early on in the process to establish what features and parameters are important to them and are required for their specific project," said Bob Turko, general manager of GE's High Voltage Solutions business. "From there, we utilize our leading, proprietary design tool — which includes multi-variable analysis — to design an optimized wind plant collector system, reducing the design cycle

time and lowering the total cost of ownership for our customers."

With GE's Wind Collector Optimization Service, the optimal route is determined between the turbines and the substation resulting in improved efficiency and a more resilient network. The solution provides a preliminary cable table with the ampacity of each collector circuit outlined in an easy-to-view, mapping file that can be viewed using Google Earth. In addition, the service includes trenching and cable cost estimates and provides insight into how efficiency can be improved through reduced power losses, optimized designs of cable sizes and trenching path configurations.

Using this optimization software, GE can reduce the cost of rationally designed collector systems, providing potential savings of greater than 20 percent while also reducing design cycle times by 60 percent.

— Source: GE Digital Energy

IEA STRESSES TECHNOLOGY BOOST TO MEET CLIMATE GOALS

Report calls for tripling public spending on low-carbon technology R&D



A concerted push for clean-energy innovation is the only way the world can meet its climate goals, the International Energy Agency stated upon the release of its flagship energy technology report.

The report, *Energy Technology Perspectives 2015 (ETP 2015)*, shows that despite a few recent success stories, clean-energy progress is falling well short of the levels needed to limit the global increase in temperatures to no more than 2 degrees C. Moreover, it will be challenging for the world to meet its climate goals solely through the UN negotiation process that is expected to yield an agreement this December in Paris. That leaves the development and deployment of new, ground-breaking energy technologies as key to mobilizing climate action, and the report urges policymakers to step up efforts to support them.

“The stakes are high for the energy sector, but it is also no stranger to profound technological change. An incredible chain of innovations in the energy sector has

been at the vanguard of social and economic transformation for over a century, and it is exciting to see the progress being made by solar panels and fuel economy improvements for passenger cars today, to name but two,” said IEA Executive Director Maria van der Hoeven.

“But we cannot be complacent,” she continued. “We are setting ourselves environmental and energy access targets that rely on better technologies. Today’s annual government spending on energy research and development is estimated to be \$17 billion. Tripling this level, as we recommend, requires governments and the private sector to work closely together and shift their focus to low-carbon technologies.”

ETP 2015 provides a comprehensive analysis of long-term trends in the energy sector, centered on the technologies and the level of deployment needed for a more environmentally sustainable, secure, and affordable energy system. Recent success stories clearly indicate that there is significant and

untapped potential for accelerating research and development in clean technologies.

Yet research and development alone are insufficient for moving new technologies from ideas to commercial products. Governments have a key role to play in creating the initial market opportunities that send a signal to innovators and drive investment. One success story involves public support for renewable energy technologies: while it has not always been efficiently targeted, it has transformed the market outlook for wind and solar to the extent that they are now the lowest-cost source of power in a number of regions.

“This result, unthinkable only a decade or so ago, is the power of innovation,” van der Hoeven said. “Given our current climate realities, more of that power must be unleashed on the world.”

ETP 2015 does not make long-term forecasts. Instead, it is built around economic modeling scenarios — each of which shows

what mix of energy technologies would need to be deployed to obtain a specific climate outcome. The main scenario of ETP 2015 — the 2-Degree Scenario, or 2DS — illustrates a transformed global energy system in which cumulative carbon emissions from fossil fuels are reduced by 40 percent relative to the “business-as-usual” scenario, or 6DS.

ETP 2015 analysis shows that the 2DS does not just allow global climate goals to be met but also enhances energy security. Best of all, it makes economic sense: for every dollar invested in the clean-energy technologies that drive the 2DS, nearly three dollars in fuel costs are avoided by 2050.

ETP 2015 includes the annual Tracking Clean Energy Progress report, which for the first time looks at progress in storage and hydrogen technology.

ETP 2015 analysis says that fostering innovation of low-carbon products and processes in industry is essential to meeting global decarbonization goals. The report demonstrates the opportunities and challenges across the entire innovation chain of various sectors for global industrial actors. In the 2DS, almost 30 percent of direct industrial CO₂

emissions reductions by 2050 hinge on processes that are in development or demonstration today.

Finally, the report says that building and maintaining strong innovation capacity in emerging economies will be key to successful deployment of sustainable energy technologies where they may have the largest impacts. Domestic innovation of low-carbon technologies in emerging economies is increasing, with some countries — especially China — closing the gap in key areas.

For obvious reasons, van der Hoeven stressed, the ETP 2015 can only model existing technologies. But she noted that the right support to innovation, coupled with effective public-private partnerships, can provide the energy technology breakthroughs that could amplify or hasten the low-carbon transition.

“The shale gas and shale oil boom of the last few years was virtually unthinkable at the dawn of this century,” van de Hoeven said. “If we only stick to the beaten path of today, we will miss the game-changers of tomorrow.” ↵

— *Source: International Energy Agency*

LUFFT WIND SENSOR CLASSIFIED FOR OFFSHORE USE

Component proven suitable for harsh environments

The Lufft Ultrasonic Anemometer VENTUS successfully completed the test at the International Technical Inspection Agency TÜV SÜD and now has the Protection Class IP68. This confirms officially that VENTUS is one of a few Ultrasonic Anemometers, protected from infiltration of dust as well as from extended submersion in water. This demonstrates again that VENTUS is perfectly suited for installations on offshore wind turbines as well as on ships or buoys. The sensors are tested and certified to provide accurate data in the harshest conditions of vibration, dust, ice and now extremely wet and corrosive offshore environments.

The Lufft VENTUS is designed for harsh conditions including operation on wind turbines in cold weather and offshore environments. The VENTUS is able to integrate into any existing wind turbine control system given its extreme flexibility of communication.

In a recent call for bids, Lufft was named the winner for the renewal and extension of ultrasonic wind sensors in the maritime monitoring network of the German Weather Service, the ultrasonic wind sensor Ventus from the Fellbach-based manufacturer of environmental measuring equipment won against all competitive products.

The weather service made the decision with the aid of a large number of very strict exclusion criteria. Only a few companies in the world are able to meet these criteria with their products and were therefore short-listed for the tender.

Among other requirements for offshore use, the ultrasonic anemometers had to be very robust and have a closed system.

“Since the sensors will be used exclusively in the maritime sector, they must be particularly well protected against extreme weather conditions and bird attacks. The Ventus ultrasonic wind sensor consists of a seawater-resistant aluminum alloy, which is also used on ship propellers. The sensor therefore withstands the corrosive conditions without any problem. In addition, thanks to its enclosed design the sensor



has already proved itself many times over with regard to bird attacks, whereas each year a large proportion of the open measuring systems from other manufacturers fail for this reason and give rise to correspondingly high repair costs. Therefore, in its tender specifications the DWD demanded a closed system,” said Udo Kronmüller, sales representative for the wind and weather segment. Technical problems caused by animals such as bird attacks are not uncommon in environmental equipment.

Therefore, Lufft GmbH decided on a closed system

for measuring wind speed and wind direction at an early stage. This makes it almost impossible for birds to damage the sensor.

Since the advantages of this design inevitably lead to the impairment of measurement uncertainty, detailed minimum standards were required for wind speed and wind direction. In order to test these and other requirements, specific tests were conducted in the DWD wind tunnel. ✎

— Source: G. Lufft GmbH