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News Release No. 6/2011 from Vestas China

Beijing, 18 October 2011
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State Grid Energy Research Institute and Vestas Jointly Publish “Integrated Solution Strategies for Coordinated Wind Power and Grid Development”

On 18 October 2011, State Grid Energy Research Institute (SGERI) and Vestas China jointly presented a book publication named “Integrated Solution Strategies for Coordinated Wind Power and Grid Development”. The book includes a comprehensive and systematic discussion on how to overcome the difficulties of large scale integration of wind power to the grid by applying an integrated solution encompassing technology, management and policy. The publication provides a valuable platform for all stakeholders involved in wind power development and utilization to discuss and resolve grid integration issues in China.

Due to the rapid growth in installations and concentrated development of wind power in China, grid development and the operation of the entire power system are facing unprecedented challenges. Thus, catalysing a coordinated development of wind power and the power grid is a pressing issue. Against this backdrop, a 10 month long research project was started in February 2010, conducted by the think tank SGERI under State Grid Corporation of China and Vestas, the world’s largest wind power solution provider with rich experience from over 60 countries. Both parties completed a research report consisting of three important aspects: international experiences, technical proposals, and finally an integrated strategy. The research activities included field research, case analyses, technical tests, and theoretical verifications. Subsequently, both parties condensed the essentials in a book with the title “Integrated Solution Strategies for Coordinated Wind Power and Grid Development” to meet the interests from industry professionals. The book describes the characteristics of wind power and the power system, provides an in-depth review of grid-friendly wind power plants and wind power friendly power systems, and finally presents ideas on an integrated solution for increasing the absorption of wind power to the grid.

The joint research indicates:

- It is necessary to include the technological, managerial and policy aspects into an integrated solution to overcome the difficulties of large scale integration of wind power to the grid. International practices prove that appropriate economic incentives schemes are a prerequisite for improving the applied technology and managing the flexibility of the power system on the supply, transmission and demand sides. This will again improve the power system’s absorption of renewable energy sources, including wind power.
- The current development of wind power and the power grid provide a solid foundation for solving the technical barriers for large-scale wind power integration to the grid. “Grid-friendly” wind turbines and wind power plant technologies exist and are applied abroad – these technologies have already been introduced in China. With regard to building a “wind power friendly power system”, China is already building a strong smart grid, and is one of the forerunners in grid technology.
- Currently, the key to large-scale wind power integration lies in building grid-friendly wind power plants and a wind power friendly power system whereby the flexibility of the entire system will be improved. Additionally, under the prerequisite of being able to provide the best conditions for the environment and the economy, and providing the minimum cost of energy, China should balance the benefit for various stakeholders involved in wind power development and utilization with supportive political and managerial mechanisms.

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Ms. Jiang Liping, the project leader of the joint research and the chief editor of the publication, Vice President of SGERI says, *"The healthy development of the wind power industry requires the efforts of wind turbine manufacturers, developers and grid corporations, who all have reached a shared understanding based on the principles of an unbiased and natural development. Thus, when talking about wind power and grid there should not be a distinction between 'you' and 'me', but it is 'us'. The joint research by SGERI and Vestas comes at the right time. We are very hopeful that all stakeholders will proactively participate in the discussion."*

Jens Tommerup, President of Vestas China says, *"First of all, I am very proud of this achievement. It is vital that the industry develops sustainably and in a coordinated way, and we are very delighted to join forces with State Grid to deliver a scientifically sound piece of research shedding light on the opportunities for steering the industry in a healthy direction. Vestas has rich experience from many countries we can share, and this is what we have done with this project. The technologies needed to solve the current challenges at the wind turbine and wind power plant level are ready to be applied."*

Mr. Shu Yinbiao, deputy General Manager of State Grid Corporation of China (SGCC) says, *"As a state-owned enterprise responsible for construction and operation of the grid, and for providing electricity to end consumers, SGCC has always supported wind and other renewable energy source as an inseparable part of our duties. The joint research of 'Integrated Solution Strategies for coordinated wind power and electricity grid' by SGERI and Vestas represents SGCC's fundamental philosophy behind our promotion of wind power. Furthermore, in solving developmental issues, our principle is to take point of departure in practical issues and holistically considering the benefit of society. I believe the research results will help stakeholders deepen their insights of the conflicts and problems of wind power development, and will provide sound support for future policy making for a coordinated development of wind power and the power grid."*

Mr. Peter C. Brun, Group Senior Vice President of Vestas says, *"Wind power makes up a significant share of the European power supply. The key to the European success story has been a close cooperation between governments, grid operators and industry players such as Vestas. We have to draw on each other's experience to ensure a sustainable co-development of grid and wind power. And we have to jointly identify the technical and regulatory solutions needed to move the industry in the right direction. As a leading industry player, we are very pleased to draw on our experience and utilize our international network for this research dedicated to China"*

The joint research received support from the supervising government bodies and many industry experts. Mr. Shi Lishan, Deputy Director of New and Renewable Energy Department of NEA; Mr. Jesper Kamp, Commercial Counselor and the head of commercial department, Royal Danish Embassy in China; Mr. Klaus Rave, Chairman of Global Wind Energy Council; Mr. He Dexin, President of Chinese Wind Energy Association (CWEA); Mr. Peter Jorgensen, Vice President, International Relations, Energinet.dk, Denmark; Mr. Zhao Qingbo, Director of Dept. of Strategic Development and Planning, SGCC attended the launch ceremony, and expressed their recognition of the joint efforts of SGERI and Vestas on resolving wind power integration challenges. Mr. Shi Lishan says in his speech, *"The research conducted by Vestas and SGERI is the most comprehensive, most consummate, systematic and advanced research report on grid integration. The publication will surely help more people understand the essence of wind power integration to the grid, and facilitates the resolution of the issue in China."*

About State Grid Energy Research Institute

www.sgeri.sgcc.com.cn

State Grid Energy Research Institute (SGERI), an wholly-owned subsidiary of State Grid Corporation of China (SGCC), specialized in soft sciences and consulting services, was established on October 25, 2009, based on the soft sciences research group of State Power Economic Research Institute (SPERI). SGERI is dedicated to the study on energy & power related issues for sustainable development of

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economy and society, and is at the same time serving as a think-tank and exchange-platform for comprehensive energy research.

SGERI's predecessor, Beijing Water and Power Economic Research Institute was established in 1984 by the former Ministry of Water Resources & Electric Power and then renamed as Beijing Economic Research Institute (BERI) in 1985. In 1999, BERI merged with Power Economic Research Department of Electric Power Research Institute of China into State Power Economic Research Center (SPEC). In 2006, SPEC was renamed as SPERI.

Through years of building up, especially by focusing research on the power industry, and providing services to relevant government ministries, organizations and enterprises domestically and abroad, SGERI has honed obvious advantages in fields such as, power sector planning, energy & environmental protection policy, power supply and demand analysis, corporate strategy and management, institutional reform and power market, accounting audit, power pricing, and energy statistics & analysis and etc, and has thereby forged a team of high professional quality and capability. Ever since its foundation, SGERI has carried out a lot of research relevant to development of China's power industry, and a batch of outcomes have been adopted by governments and enterprises. Many projects were honored by national authorities.

In order to address the challenges of energy transition in coming future, especially in renewable energy development, SGERI expands its research spectrum to macroeconomics, comprehensive balance of coal, electricity, oil and transportation, smart grid, alternative, low-carbonization of energy on the basis of traditional expertise, to build an influential think-tank and exchange-platform for comprehensive energy research in China and abroad. Committing itself to key issues in energy sector & power industry, SGERI provides decision-making references to government and related stakeholders, and contributes to building an open and interactive platform of communications and exchanges.

About Vestas

Vestas is the world leader in wind technology, with a history of technological innovation and over 30 years of experience in developing, manufacturing, installing and maintaining intelligent, high performing and high quality wind power plant solutions. Vestas was a pioneer in the wind industry and started to manufacture wind turbines in 1979.

Vestas installed China's first wind turbines in Shandong in 1986, and as of 30 June 2011, Vestas has installed more than 3,100 MW of clean energy across 13 provinces in China. This makes Vestas one of the biggest accumulated suppliers of wind power plants in China.

Over the past few years, Vestas has established a firmly rooted presence in China with more than RMB 3.5 billion worth of investments and more than 3,100 employees, committed to delivering high quality wind energy solutions for a sustainable energy future.

Vestas has its largest integrated manufacturing complex globally situated in Tianjin, its China headquarters in Beijing, a factory in Hohhot, a global procurement office in Shanghai and a state-of-the-art foundry in Xuzhou.

In October 2010, Vestas opened its China Technology R&D Centre in Beijing, which is an important part of Vestas' global innovation network and represents Vestas' intention to bring the best of its knowledge to China. Furthermore, the R&D Centre is significantly increasing Vestas' responsiveness to market demands and development trends in terms of new technology.

As the global leader in wind energy, Vestas is committed to help develop China's wind energy sector into a world-class modern renewable energy sector. Vestas is actively sharing its 30 years of industry experience and expertise with partners and stakeholders in the Chinese wind energy industry.

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