

Energy Sector Power Transmission Division

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Siemens to supply converter stations for HVDC connection between Estonia and Finland – Transmission capacity between the two countries to increase threefold

Siemens Energy is building the converter stations in Püssi, Estonia, and Anttila, Finland, for the new high-voltage DC (HVDC) connection between the two countries (“EstLink 2”). The system, with a transmission capacity of 650 megawatts at a DC voltage of ± 450 kilovolts, will increase the capacity for transmission between the Baltic and Nordic countries from 350 MW to 1000 MW. It will also make the power supply more reliable. The output between the two stations will travel over a 14-kilometer overhead line, a 145-kilometer submarine cable across the Gulf of Finland, and a 12-kilometer land cable. The customers are the Fingrid power utility in Helsinki and the Estonian power network operator Elering, in Tallinn. The total order value for the project, which is being partially funded by the EU, is EUR 320 million, and Siemens’ share is about EUR 100 million. The converter stations are planned to go into operation early in 2014.

The EstLink 2 HVDC connection will not only triple the power transmission capacity between Finland and Estonia, but also make a significant contribution toward the planned integration of energy markets between the Baltic and Scandinavian countries. “We can especially benefit from our experience in HVDC technology in projects where large amounts of energy have to be carried across long distances. But even shorter cable runs, whether underground or underwater connections, can benefit from the low transmission losses with HVDC. Given the worldwide plans for expanding renewable energy sources, the number of HVDC projects is bound to increase all over the world,” said Udo Niehage, CEO of the Transmission Division of the Siemens Energy Sector.

For EstLink 2, Siemens is responsible for designing the entire HVDC system as a monopolar connection, using the cable as the metal return conductor. The contract also includes delivering, installing and commissioning the core components, like converter valves with directly light pulse

fired power thyristors, converter transformers, smoothing reactors, protection and control systems, and AC and DC filters.

High-voltage direct-current transmission (HVDC) is always in demand when the conventional three-phase power transmission method runs up against its technical and economic limits. An HVDC connection has 30 to 40 percent less transmission loss than a comparable three-phase AC transmission connection. For that reason, HVDC connections can be as much as 2,000 or 3,000 kilometers long with comparatively low losses. That makes it possible to connect far-flung renewable energy sources to centers of consumption – for example hydroelectric power or offshore wind energy in Europe (via submarine cables), or, in the future, solar power from the Sahara.

Energy-efficient high-voltage direct-current transmission systems (HVDC) are part of Siemens' Environmental Portfolio. In fiscal 2010, revenue from the Portfolio totaled about EUR 28 billion, making Siemens the world's largest supplier of ecofriendly technologies. In the same period, our products and solutions enabled customers to reduce their carbon dioxide (CO₂) emissions by 270 million tons, an amount equal to the total annual CO₂ emissions of the megacities Hong Kong, London, New York, Tokyo, Delhi and Singapore.

The **Siemens Energy Sector** is the world's leading supplier of a complete spectrum of products, services and solutions for the generation, transmission and distribution of power and for the extraction, conversion and transport of oil and gas. In fiscal 2010 (ended September 30), the Energy Sector had revenues of approximately EUR25.5 billion and received new orders totaling more than EUR30.1 billion and posted a profit of more than EUR3.6 billion. On September 30, 2010, the Energy Sector had a work force of more than 88,000. Further information is available at: www.siemens.com/energy.