Czech republic load shifting

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The single European electricity market is growing ever closer together. In this context, 50Hertz is a strong partner at the centre of the European grid. International transmission lines, so-called interconnectors, connect the transmission system of 50Hertz with the transmission systems of other countries. They are part of a sustainable development of the European grid infrastructure. Trusting international cooperation is indispensable to meet the demands of the energy transition in Germany as well as the EU plans to create a single integrated European electricity market while optimising grid development.

An interconnector is a power line connecting the electricity grids of two countries. Interconnectors, i.e. international transmission lines, link the transmission systems of all countries of the EU together, enable international power trade and increase the security of supply. All national transmission systems and their linking cross-border interconnectors together create the European interconnected grid.

The transmission system of 50Hertz is electrically connected to Poland via two lines and to the Czech Republic via one line. There are two interconnectors to Denmark including the Kriegers Flak Combined Grid Solution that has been commissioned in 2020 and which involves German and in future also Danish offshore wind farms. A lot of preparation work is being performed for the construction of a new interconnector with Sweden across the Baltic Sea - the Hansa PowerBridge - and there are plans to create a third interconnection with Poland.

The KONTEK link is a high-voltage direct current (DC) transmission connection (HVDC connection) operated at 400 kV between the transmission grids of 50Hertz and the Danish transmission system operator Energinet. With a length of 170 km and a technical transmission capacity of 600 MW both in northbound and southbound direction, the KONTEK line has been in operation between Bentwisch near Rostock and Bjaeverskov in Denmark since 1996. More information on the KONTEK interconnector can be found here.

Another interconnector to Denmark involving German and in future also Danish offshore wind farms is in operation since end of 2020. This joint 50Hertz and Energinet project has been funded by the European Union. More information on the Kriegers Flak - Combined Grid Solution can be found here.

Germany and Sweden want to link their power grids together via a planned submarine cable connection: the Hansa PowerBridge. This international direct current (DC) line shall be about 300 kilometers long and connect the two electricity transmission grids of Germany and Sweden. The German-Swedish interconnector is expected to contribute to stabilisation of electricity prices in Germany and South Sweden, increase of operational security of transmission grids and the indirect storage of electricity from wind and solar power plants in Scandinavian water pump storages.

Further information on the Hansa PowerBridge interconnector, for which intensive preparation is currently

taking place, can be foundhere.

Between the transmission grids of 50Hertz and the Czech transmission system operator ?EPS, there is one cross-border alternating current (AC) line between substation R?hrsdorf (Germany) and substation Hradec (Czech Republic) which is in operation since 1959. At the beginning, this line was operated at a nominal voltage of 220 kV. Since an upgrade in 1976, the line is operated at a voltage of 380 kV.

There are currently two cross-border electricity lines (see graph) between the transmission systems of 50Hertz and the Polish transmission system operator PSE. Both lines are alternating current lines (AC). The northern interconnector between the substation Vierraden (Germany) of 50Hertz and the substation Krajnik (Poland) of PSE was commissioned in 1987 with a nominal voltage of 220 kV. After reinforcements of the interconnector and the two substations the nominal voltage level of the interconnector is updated to 380 kV since 2018.A second interconnector with a nominal voltage of 380 kV further to the south, between the substations Hagenwerder (Germany) and Miku?owa (Poland), isin operation since 1999.

A third connection line ("3rd interconnector") between Eisenh?ttenstadt (Germany) and Plewiska (Poland) is currently in the planning phase. The project is a European priority project and was declared as an urgently needed project in 2009 by the Bundestag"s Power Grid Expansion Act (ENLAG). In a complementary note to the ten-year grid development plan of the European Network of Transmission System Operators (ENTSO-E), the Polish transmission system operator nevertheless pointed out its altered grid development priorities. Commissioning is therefore only expected as of 2030. Further information regarding this project can be found here.

Utilisation of German-Polish interconnectors willfurther increase in consequence of an expected growth of demand for importedenergy as well as higher wholesale prices in Poland. This is one of the conclusionsderived from a study on European power markets commonly carried out by 50Hertzand the Polish TSO PSE S.A. supported by the National Centre for Nuclear Research(NCBJ) in Warsaw. The German and Polish Ministries responsible for energy wereinvolved. The recently finalised investigation was focused on long-term prospects of transmissionsystem operation in the German-Polish region from the perspective of futuremarket outcomes. Different scenarios have beensimulated for the two target years 2025 and 2030.

AnExecutive Summary about the results of the cooperation study is available here.

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