

Fenno-Skan Interconnecting grids

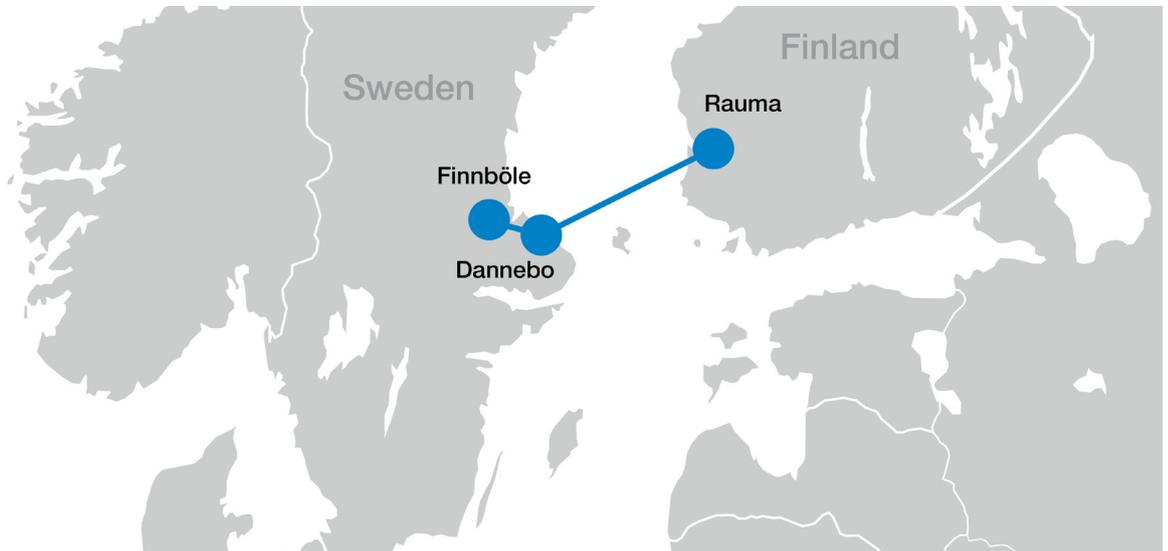


ABB Id No: POW0106

Fenno-Skan reduces the electrical distance between major generation and load areas in Finland and Sweden from 1500 km to 200 km.

The 500 MW \pm 400 kV Fenno-Skan 1 & 2 HVDC links are owned by Fingrid Oyj and Svenska Kraftnät, transmission system operators in Finland and Sweden. Fenno-Skan 1 was commissioned in 1989; the Fenno-Skan 2 link became operational in Dec. 2011, increasing capacity by another 800 MW. The addition of Fenno-Skan 2 helps to strengthen the Nordic power grid, enhance the capacity for power trading and improve the security of power supplies in the region.

In parallel with the delivery of Fenno-Skan 2, the control system of the original Fenno-Skan link was upgraded to a fully digital MACH system. Fenno-Skan 1 was originally built as a 233-km long monopolar link using sea return for the current, but will now become a bipole. The stations were built to eventually accommodate a second pole.

The 200-km long undersea cable reaches Finland south of the town of Rauma. A 33-km long overhead line connects it with the Rauma converter station. Dannebo, the Swedish converter station for Fenno-Skan 1, is near the Forsmark nuclear power station on Sweden's east coast. The DC cable comes into the converter station area, since the station is only about 1 km from the coast.

For Fenno-Skan 2, due to AC grid constraints, the Swedish converter station is located further inland - at Finnböle, and a 70-km long overhead DC line will connect it to the submarine cable. The cable will be connected to the Finnish transmission grid at the Rauma substation.

Fenno-Skan reduces the electrical distance between major generation and load areas in Finland and Sweden from 1,500 km to 200 km.

Main data:

Commissioning year:	Upgrade Fenno-Skan 1: 2013 Pole 2: 2011 Pole 1: 1989
Power rating:	Pole 1: 500 MW Pole 2: 800 MW
No of circuits:	2
AC voltage:	400 kV (both ends)
DC voltage:	Pole 1: 400 kV Pole 2: 500 kV
Length of DC submarine cables:	200 km
Length of DC overhead line:	33 km (Finnish side) Pole 2: 70 km (Swedish side)
Main reason for choosing HVDC:	Length of sea crossing
Application:	1989: Interconnecting grids 2011: Interconnecting grids 2013: Upgrade Fenno-Skan 1