

EstLink 2



EstLink 2 is a high voltage direct current (HVDC) interconnection between Estonia and Finland.

Importance of EstLink 2

EstLink 2 is increasing the security of electricity supply in Estonia and the Baltics. At the same time, EstLink 2 plays an important role in the effective functioning of the electricity market. Together with EstLink 1, acquired by Elering AS and Fingrid Oyj at the end of 2013, EstLink 2 increases the transmission capacity between Estonia and Finland to 1,000 MW, making Finland and Estonia essentially one market area.

Project information

In EstLink 2 HVDC interconnection the “classic” monopole current source converter technology (LCC) with insulated metallic return conductor is used.

Nominal transmission capacity:	650 MW
Nominal voltage:	450 kV
Connection in Estonia:	Püssi 330 kV substation
Connection in Finland:	Anttila 400 kV substation

Total length:	~170 km
Submarine cable	145 km
Underground cable in Estonia	12 km
Overhead line in Finland	14 km

Ownership:	50 % Elering AS 50 % Fingrid Oyj
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Cost:	320 MEUR, of which
EU funding	100 MEUR
Submarine and underground cable	ca 180 MEUR
Converter stations	ca 100 MEUR

Cable supplied and built by	Nexans Norway AS
Converter station built by	Siemens AG and Siemens Oyj consortium
Püssi substation expanded by	Siemens Osakeyhtiö Estonian branch
Anttila substation built by	Empower Oy

Project schedule

01/2008	start of preparatory works
07/2009	seabed survey
05/2010	start of cable and converter station tendering process
12/2010	signing of contracts for building the cable and converter stations
12/2011	start of converter station construction
12/2012	end of submarine cable installation
09/2013	end of underground cable installation and jointing
12/2013	end of system testing and start of trial operation period
02/2014	final handover of EstLink 2

Submarine and underground cables

The submarine cable consists of two over 70 km long sections connected by a joint. The underground cable was installed by approximately 1 km long sections. Altogether there are 12 underground cable sections, 11 joints, and one transition joint to connect the submarine and underground cables.

Submarine cable

Weight: 76kg /m

Diameter: 15 cm

- 1) Conductor
- 2) Paper insulation
- 3) Lead alloy sheath
- 4) Semiconducting screen
- 5) Return conductor
- 6) Return conductor insulation
- 7) Armour
- 8) Outer serving



Underground pole cable

Weight: 45kg/m

Diameter: 13cm

- 1) Conductor
- 2) Paper insulation
- 3) Lead alloy sheath
- 4) Semiconducting screen
- 5) Metallic reinforcement tapes
- 6) Outer serving



Underground return current cable

Weight: 20kg/m

Diameter: 9cm

- 1) Return conductor
- 2) XLPE insulation
- 3) Outer serving



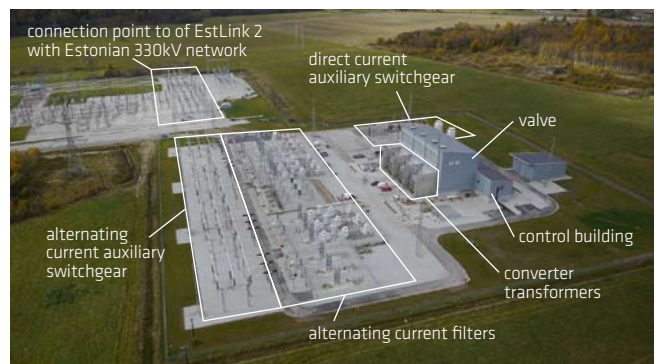
Püssi and Anttila converter stations

The heart of the converter station is the valve where alternating current is converted to direct current and vice versa. Direct current is created by switching semi-conductive elements. In EstLink 2 converter station the 4" light-triggered thyristors are used.

The EstLink 2 valve hall houses the 12-pulse valve converter which consists of three stacks, each having four valves. Each valve contains two modules with 64 thyristors. In total 768 thyristors are used in one station.



Püssi converter station valve hall



Püssi 330kVAC / 450 kVDC converter station

Three one-phase transformers are used in EstLink 2 converter stations, each of them having one primary and two secondary windings. The nominal power of each transformer is 261 MVA and the total weight is 341 tons, out of which nearly 80 tons is made up of oil. The purpose of the alternating current filters (4 sets) is to reduce the harmonic voltage distortion and the harmonic currents flowing into the connected AC systems as well as to compensate the reactive power consumed by the thyristors. Main systems in the converter stations, including the control and protection systems, are duplicated.