



# Status HVDC submarine cables Statnett

Carl Erik Hillesund

Head of cable and installation department

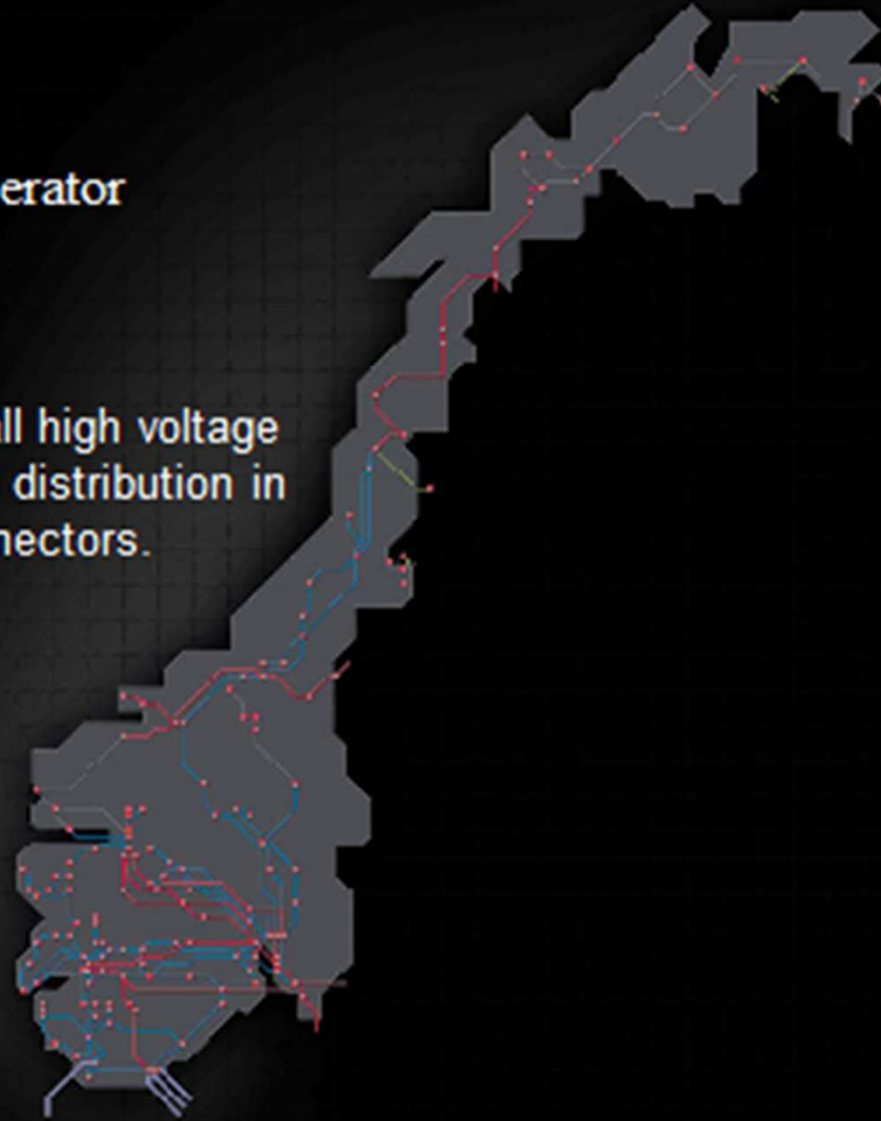
2013-11-20



## STATNETT

Statnett is the Norwegian Transmission System Operator (TSO) and owner of the transmission grid.

Statnett is responsible for all high voltage electricity transmission and distribution in Norway as well as interconnectors.



**Statnett**

# Existing and planned HVDC submarine cable projects



## Existing HVDC submarine cables

- Skagerrak 1,2 and 3
- NorNed

## Planned HVDC submarine cables

- SK4 (installed, not commissioned)
- NordLink
- NSN

# Skagerrak 1,2,3 and 4 Energinet.dk and Statnett



## Skagerrak 1 and 2 (2 x 250 MW)

- Went in to service in 1976 and 1977
- +/- 250 kV (LCC converter technology)
- 113 km overheadline
- 127 km submarine cable
- Max water depth 530 meters
- MI cable 800 mm<sup>2</sup>

## Skagerrak 3 (500 MW)

- Went into service 1993
- 350 kV (LCC converter technology)
- 113 km overheadline
- 127 km submarine cable
- Max water depth 530 meters
- MI cable 1400 mm<sup>2</sup>

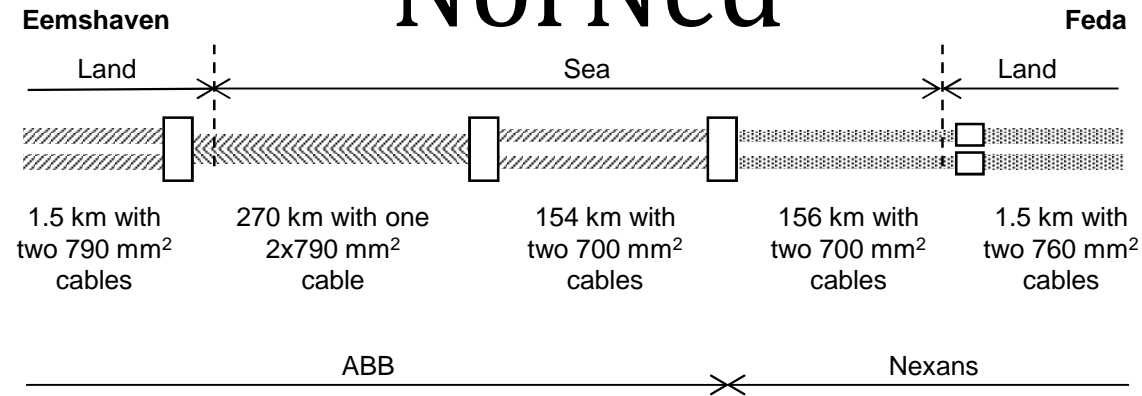
## Skagerrak 4 (700 MW)

- Installed, planned to be commissioned in 2014
- 500 kV (525 kV)(VSC converter technology)
- 140 km submarine cable
- 13 km land cable in Norway
- 90 km land cable in Denmark
- Max water depth 530 meters
- MI cable 1600 mm<sup>2</sup>



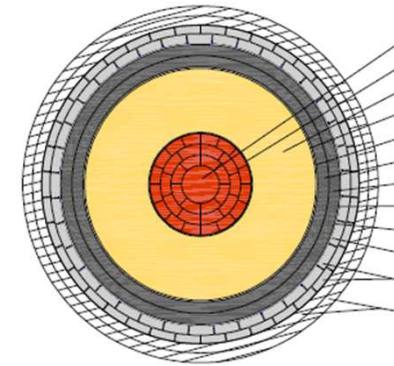
Nexans

# NorNed



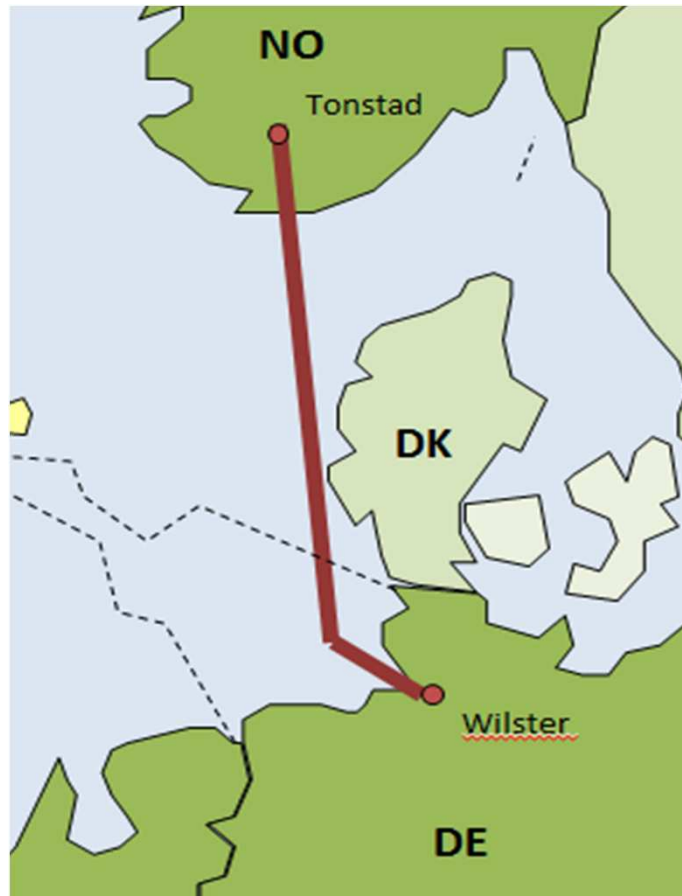
ABB

- NorNed 700 MW
- 450 kV (LCC converter technology)
- Total length 580 km
- Went into service 2008
- Max water depth 420 m



Nexans

# NorLink



## Interconnector to Germany

- Statnett, TenneT and KfW
- Route length; 570 km
- Landing point Norway; Tonstad
- Landing point Germany; Wilster
- 2 MI cables - 1400 MW
- Scheduled to be in operation in 2018

# NSN



## Interconnector to UK

- Statnett and NG
- Route length; 720 km (2 x MI cable)
- Landing point Norway; Kviteseid
- Landing point UK; Blyth
- 1400 MW
- Scheduled to be in operation in 2020