

# COBRA CABLE

## INSTALLATION IMPACT & INSTALLATION DEPTH OPTIMISATION

The COBRA HVDC cable is to connect the Dutch grid at Eemshaven with the Danish grid at Endrup. It will be installed through the morphological dynamic area of the Ems estuary and the Waddenzee.

As an option under the contract it is possible that along parts of the cable route a trench will be dredged prior to cable installation. Dumping of the dredged material close to the trench can be cost efficient as long as the back fill remains low. Furthermore it is relevant to know the natural sedimentation rates in order to establish the necessary overdepth of the trench to be constructed.

For this purpose several simulations have been performed with our process based two-dimensional hydro-morphological model FINEL2D-SWAN. This model calculates sediment transports and bottom changes due to both (tidal) currents and waves.

For the Waddenzee section of the COBRA cable significant maintenance on the depth of burial is expected over its 40 years life time. The extent of the maintenance relates, amongst

others, to the initial burial depth. Deeper installation to reduce maintenance is faced with significant technical challenges and higher initial costs. As part of a life cycle approach the additional efforts and CAPEX costs for deeper initial installation are to be balanced against the cable burial related efforts and OPEX costs during the operation phase.

A historical analysis is made of the maintenance frequency and reburial length, if the cable would have been installed in 1985. In the second step a model prediction is made of 40 years of seabed development. The model is validated by comparing the historical data and the hindcast over the period 1985-2014.

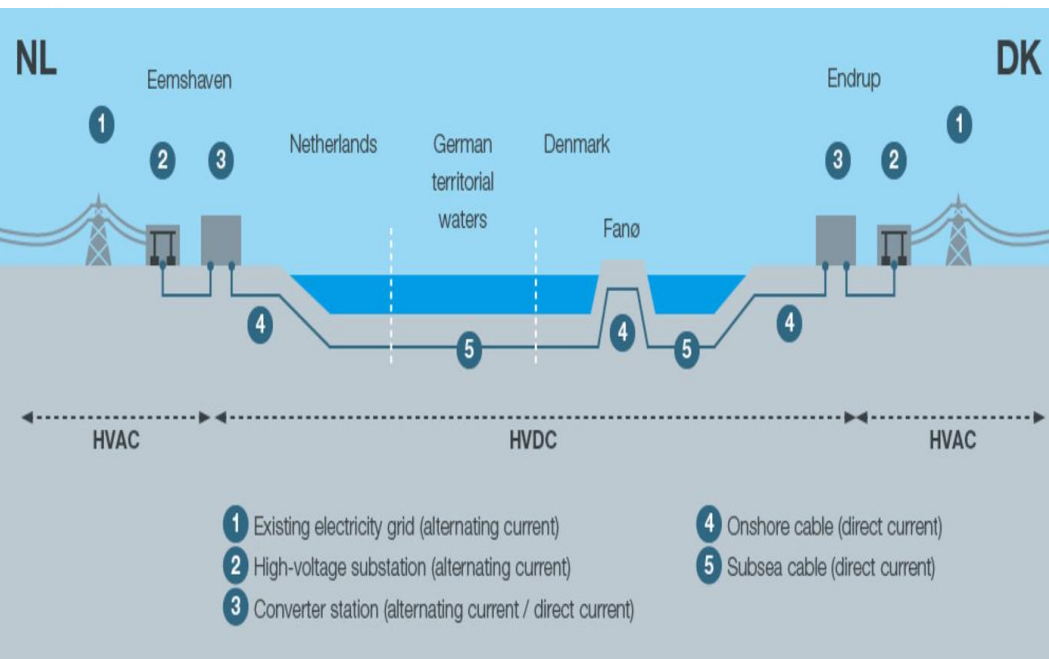
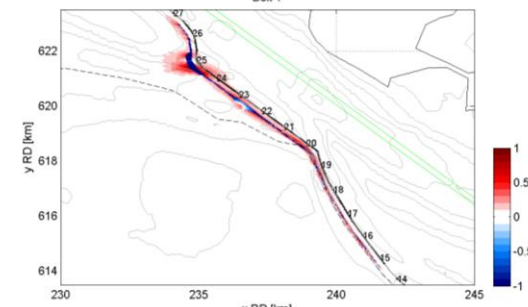
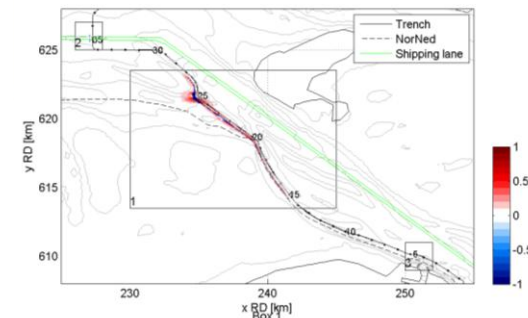
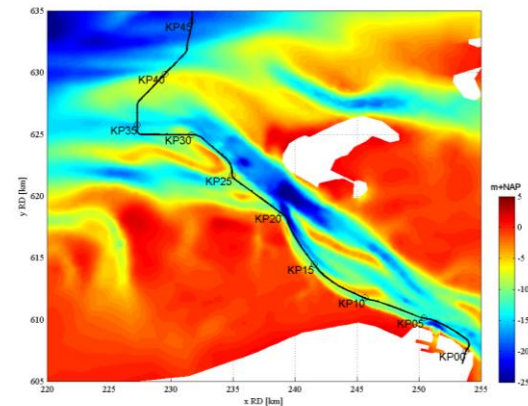
An important conclusion of the study is that the reduction in maintenance on the depth of burial for deeper installation is significant.

CLIENT  
TenneT TSO

LOCATION  
Netherlands

DATE  
2014/2015

SERVICES  
Trench Sedimentation modelling  
Installation depth optimisation



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