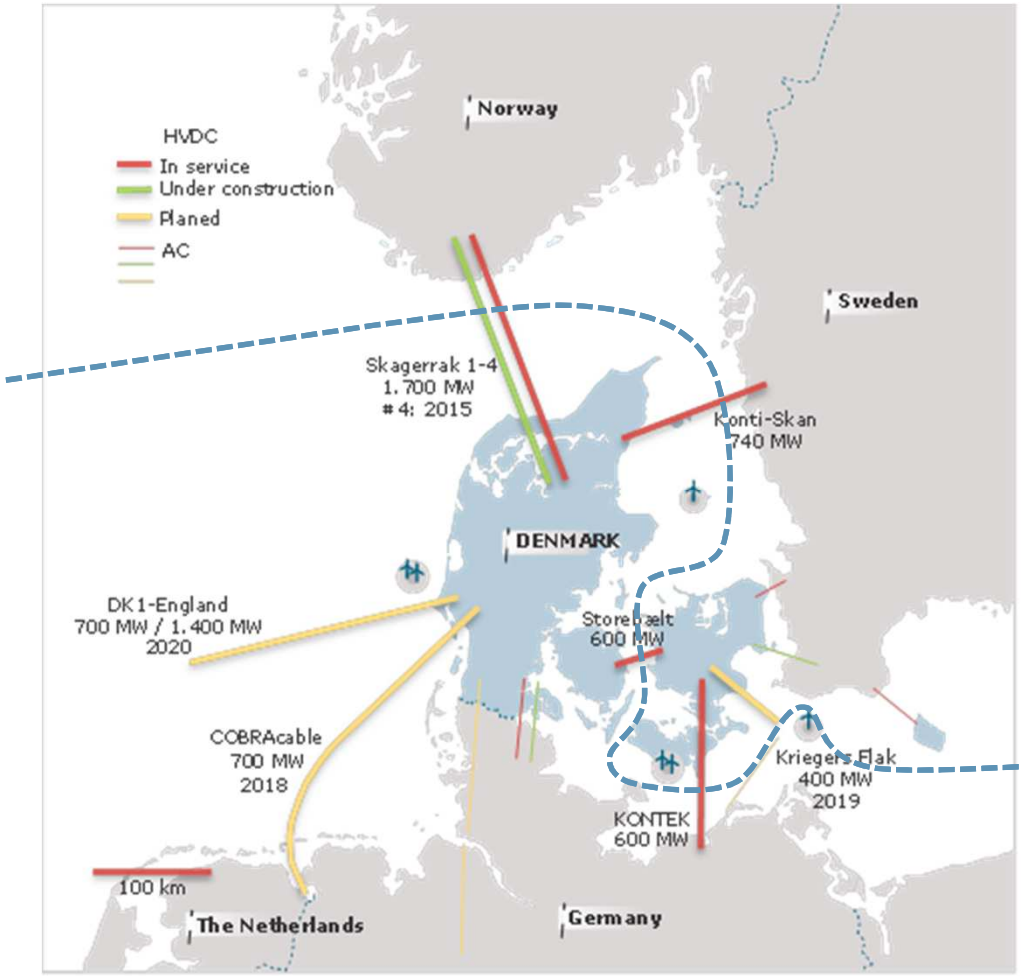
Energinet.dk HVDC Links



700 km DC

Installed

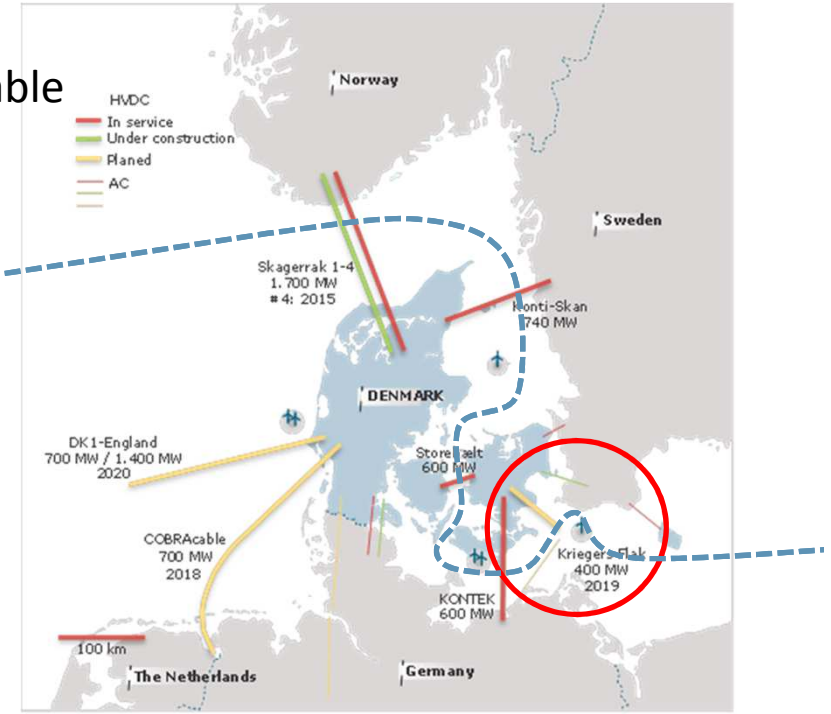
(North) 50 Hz

(Central Eurpe) 50 Hz

ENERGINET.DK

Krigers Flak (ITT out soon)

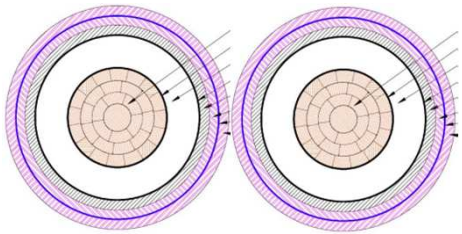
- **Kriegers Flak (VSC - bipole)**
  - Kriegers Flak
    - 2 x 82 km submarine cable
      - 2 x single core extruded HVDC cable
    - 2 x 6 km underground cable
      - 2 x single core extruded HVDC cable
    - 320kV, 600 MW



EXTRUDED BECAUSE:

- To OWF => needs to be VSC on platform
- Requirement to magnetic deviation in danish waters => Bundled cable!
- No (1) sea joints on bundled cables
- Cheaper?
- Better delivery times
- (Alternatives allowed!!)

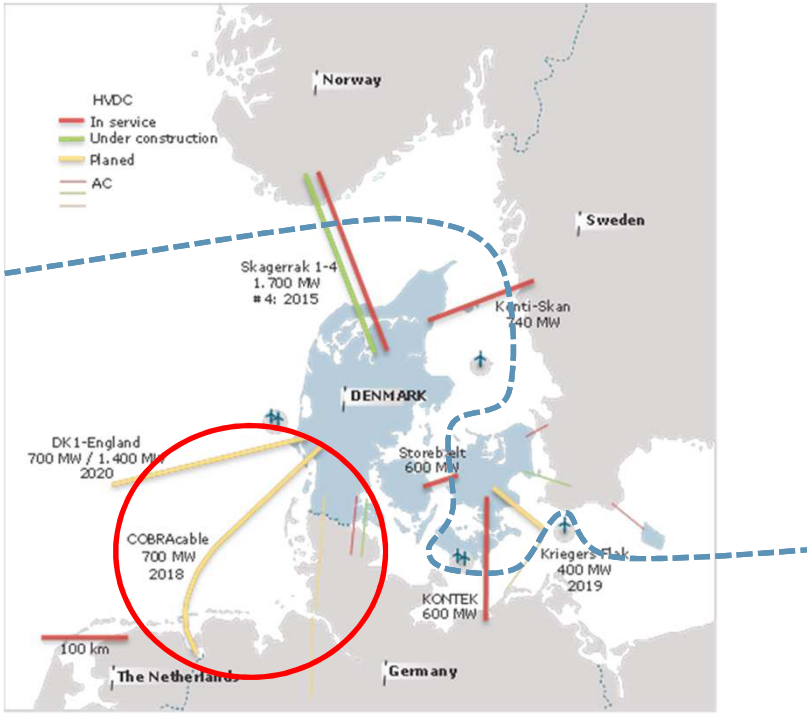
Cobra (OK in DK BOD)



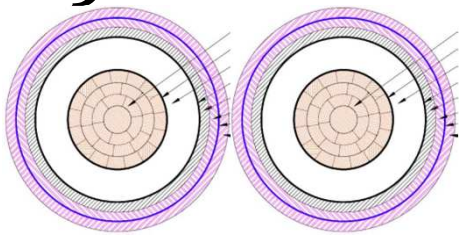
- **Connection to the Netherlands (VSC – bipole)**
  - **COBRAcable**
    - 2 x **320** km submarine cable
    - 2 x 50 km underground cable
    - 320kV, 700 MW

EXTRUDED BECAUSE:

- Probably VSC anyway
- Requirement to magnetic deviation in danish waters => Bundled cable!
- Fewer sea joints on bunled cables
- Cheaper?
- Better delivery times
- (Alternatives allowed!!)



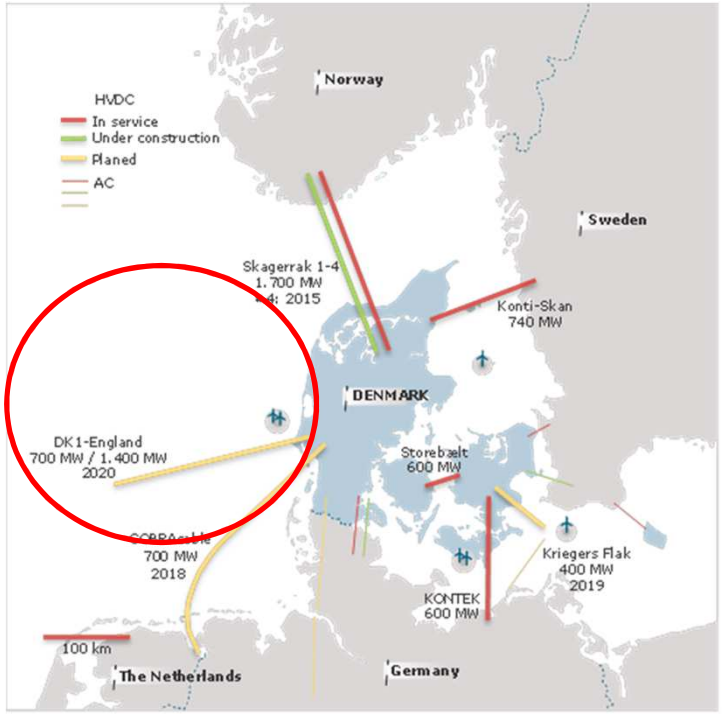
DK1-UK (under eval.)



- **DK1 – UK (VSC - bipole)**
  - DK1-UK
    - 2 x ≈**600 km** submarine cable
    - 2 x ≈ 50 km underground cable
    - 320kV, 700/1400 MW <u>- Extruded ?</u>

EXTRUDED BECAUSE:

- Cable deside VSC or LCC
- Requirement to magnetic deviation in danish waters => Bundled cable!
- Fewer sea joints on bunled cables
- Cheaper – Cable
- Better delivery times
- (Alternatives allowed!!)



Extruded DC cables

What will Energinet.DK look for:

- Testing (CIGRE TB 496)
  - Development
  - Prequalification
  - Type Test
- Technical Knowledge
  - Material
  - DC fields, Space Charges
- Experience