

Fehmarnbelt Fixed Link

Closer Together - New Opportunities

ZÖLLNER Symposium, 13.09.2023



Co-funded by
the European Union

Femern
Sund ≈ Bælt

WHY A FIXED LINK?

BY CAR AT 110 KM/HR

10 MINS

BY TRAIN AT 200 KM/HR

7 MINS

COPENHAGEN – HAMBURG

2.5 HRS

SAVING

160 KM



**FAST, FLEXIBLE
AND GREEN
TRANSPORTATION**

THE WORLD'S LONGEST IMMERSED TUNNEL

LENGTH

18 KM

SIZE OF TUNNEL FACTORY IN RØDBYHAVN

1.5 MILLION M²

CONSTRUCTION BUDGET (2015 PRICES)

EUR 7.1 BILLION

USER-FINANCED

100 %

LOLLAND

Rødbyhavn



Puttgarden

FEHMARN

89 TUNNEL ELEMENTS

STANDARD ELEMENTS

79



LENGTH

217 _M

WIDTH

42 _M

HEIGHT

9 _M

WEIGHT

73,500 _T

SPECIAL ELEMENTS

10



LENGTH

39 _M

WIDTH

47 _M

HEIGHT

13 _M

WEIGHT

21,000 _T

TRANS-EUROPEAN TRANSPORT NETWORK (TEN-T)

**PART OF THE FUTURE
EUROPEAN TRANSPORT
NETWORK**



FINANCING MODEL

CONSTRUCTION BUDGET

EUR 7.1 billion (2015-prices)

FINANCING

State guarantees on loans – user-financed;
repayment of loans by means of revenue
from traffic through the tunnel

AMORTISATION PERIOD

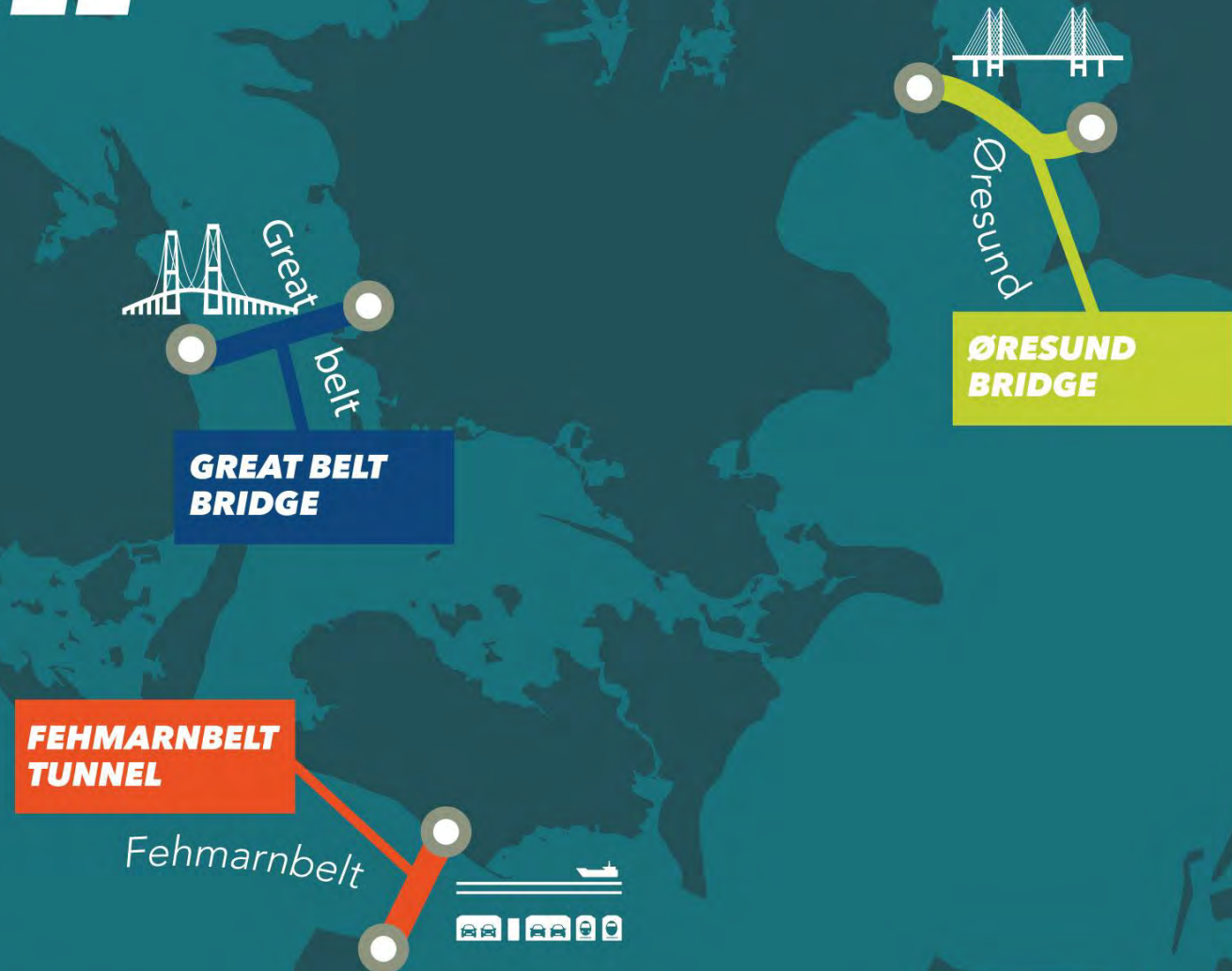
28 years

FINANCING MODEL

Approved by the European Commission

EU SUPPORT IN THE CONSTRUCTION PHASE

EUR 1.1 billion



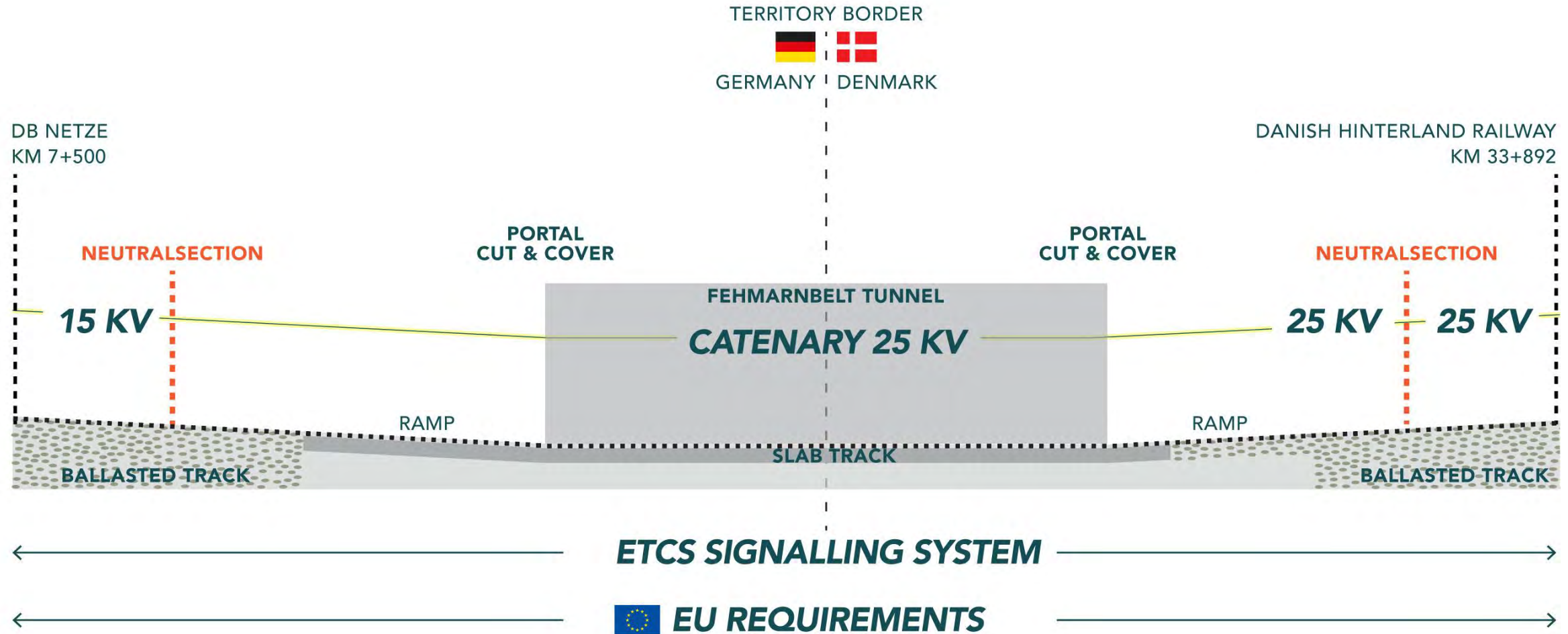
INVESTMENTS IN THE FEHMARN CORRIDOR

**RINGSTED - LÜBECK
IN TOTAL:
OVER DKK 100 BILLION**

BUDGET (DKK BILLION IN 2021 PRICES)



RAILWAY INFRASTRUCTURE PARTS



SAFETY IN TUNNEL / RAIL

- TUNNEL APPROXIMATELY 18 KM LONG.
 - trains must comply with TSI's for this kind of tunnel.
- Railway equipped with ERTMS level 2.
- Devided in approximately 11 block sections in each tube.
- MAXIMUM 3 TRAINS IN EACH TUBE,
 - minimum one empty blocksection between two trains.
- IN CASE OF AN INCIDENT
 - trains must be out of the tunnel within 20 minutes (ERTMS reversing function is expected).
- MAIN EVACUATION SCENARIO FOR PASSENGER TRAINS
 - stay in train and get train out of tunnel.
- IF TRAIN CAN'T MOVE
 - evacuation via east road tube.



Photo from Øresund Fixed Link



Stakeholders, railway

Technical interfaces

- Interface workstreams



Dialogue with Railway Undertakings

- Fehmarn Belt Platform



Railway Authority Approvals

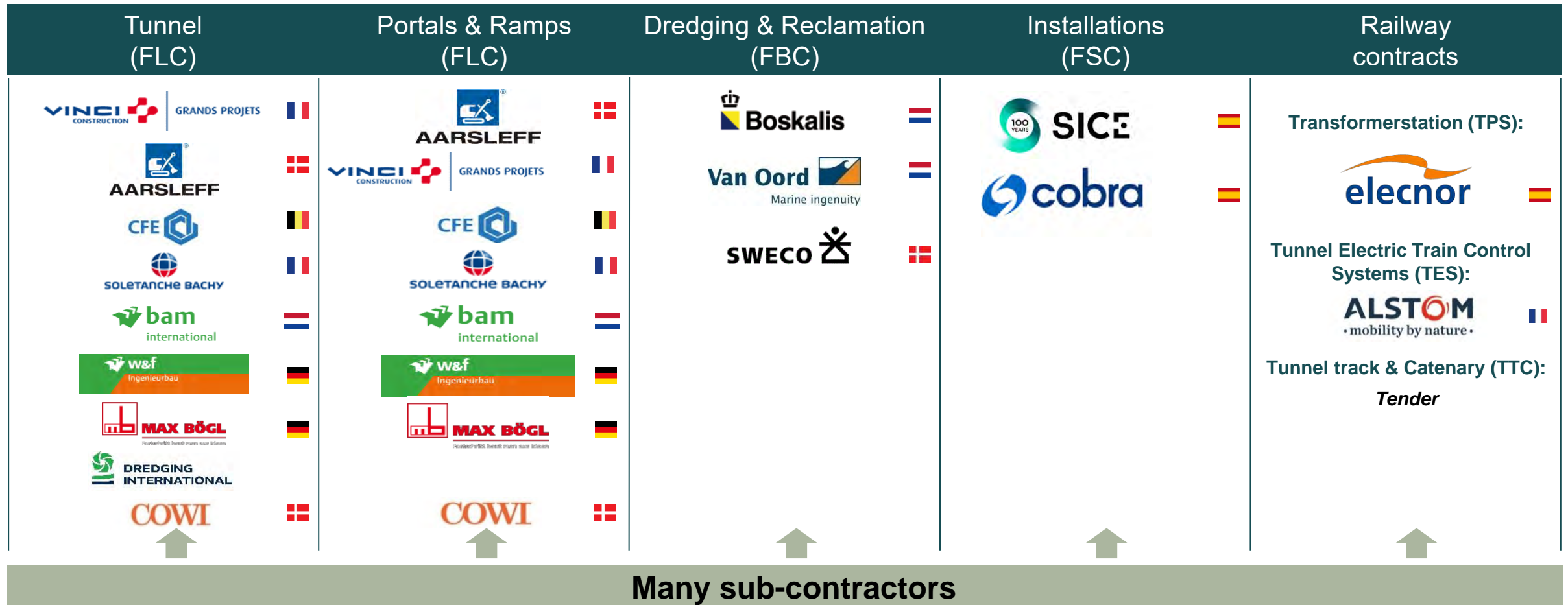
- Safety authorisation to become Railway Infrastructure Manager
- Authorisation for Placing into Service (APIS)



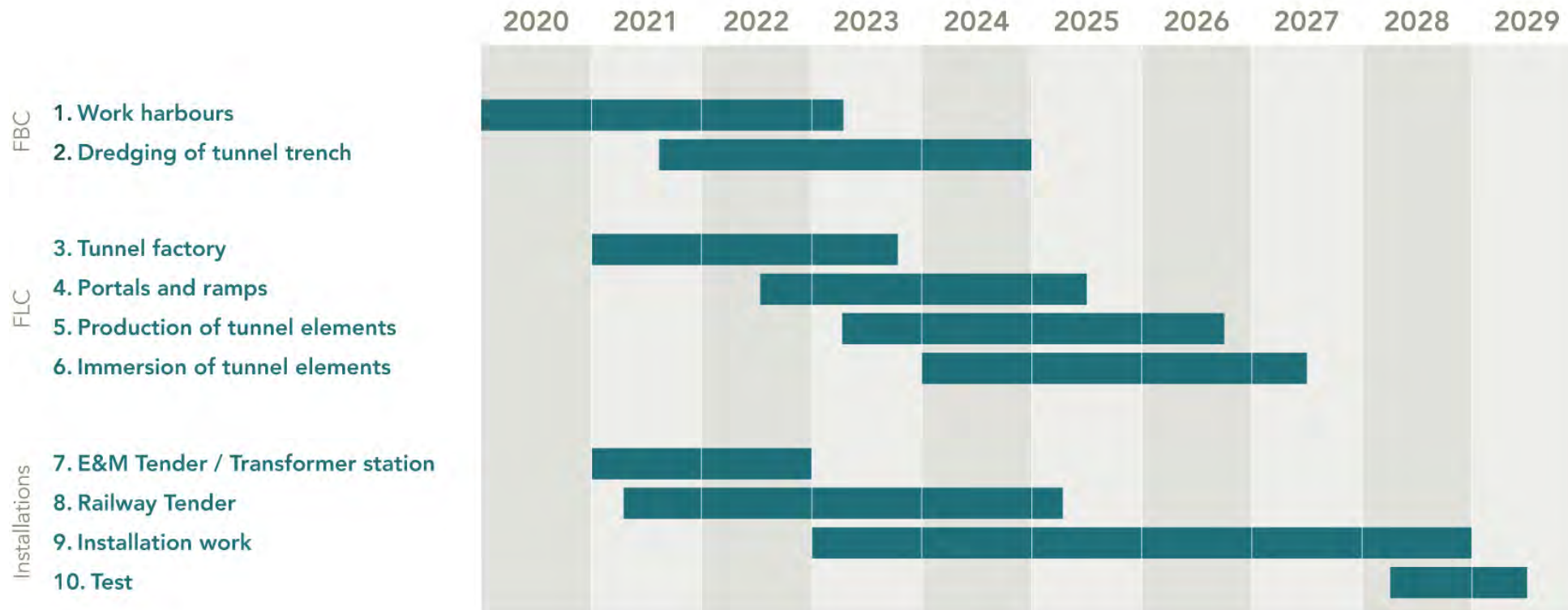
Eisenbahn-Bundesamt

The companies building the fixed link

Femern A/S is client company with RAT (Rambøll, Arup and TEC), Atkins and Afry as key technical advisor



Time schedule





Illustration, Rødbyhavn

Rødbyhavn, August 2023



Illustration. Production site Rødbyhavn



Production site Rødbyhavn, August 2023



Illustration. Tunnelportal, Rødbyhavn



Tunnelportal, Rødbyhavn,
august 2023



Illustration, Future portal area at Puttgarden



Puttgarden, August 2023



**Thank you for your
attention!**

www.femern.dk