



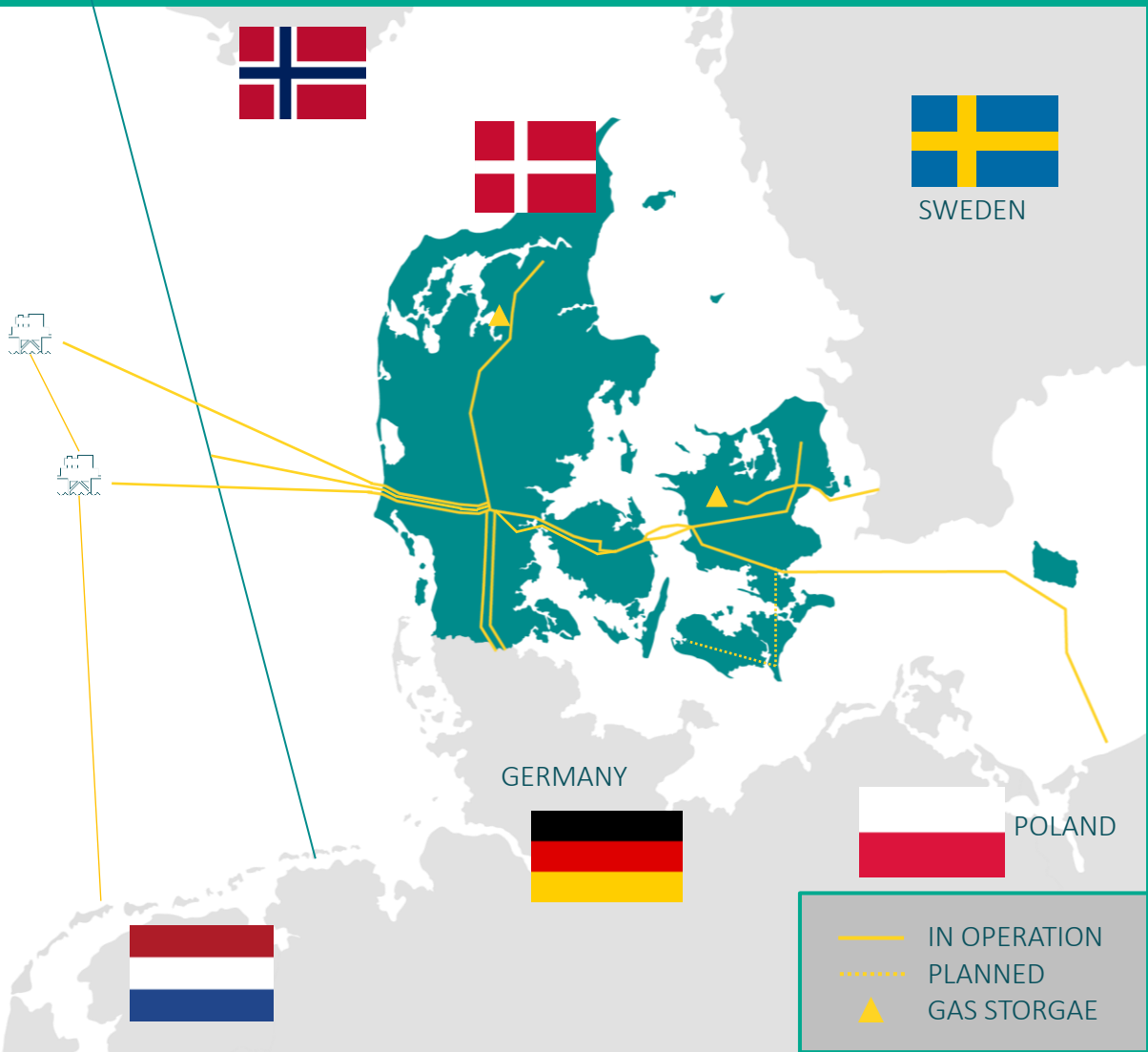
STRATEGI

ENERGI TIL TIDEN

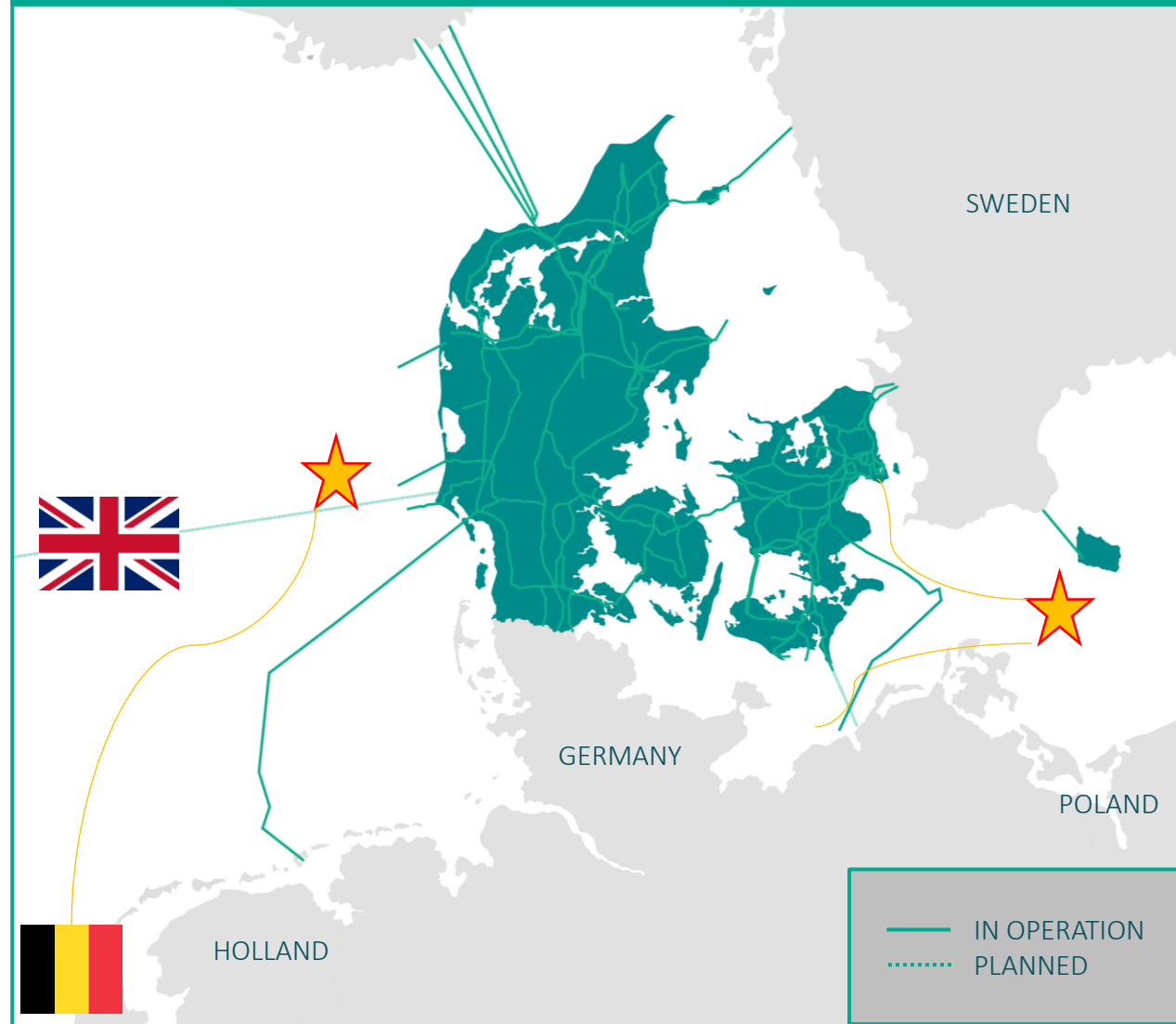
Nicolai Sørensen, Seniorrådgiver, Energinet Systemansvar

INFRASTRUCTURE TODAY

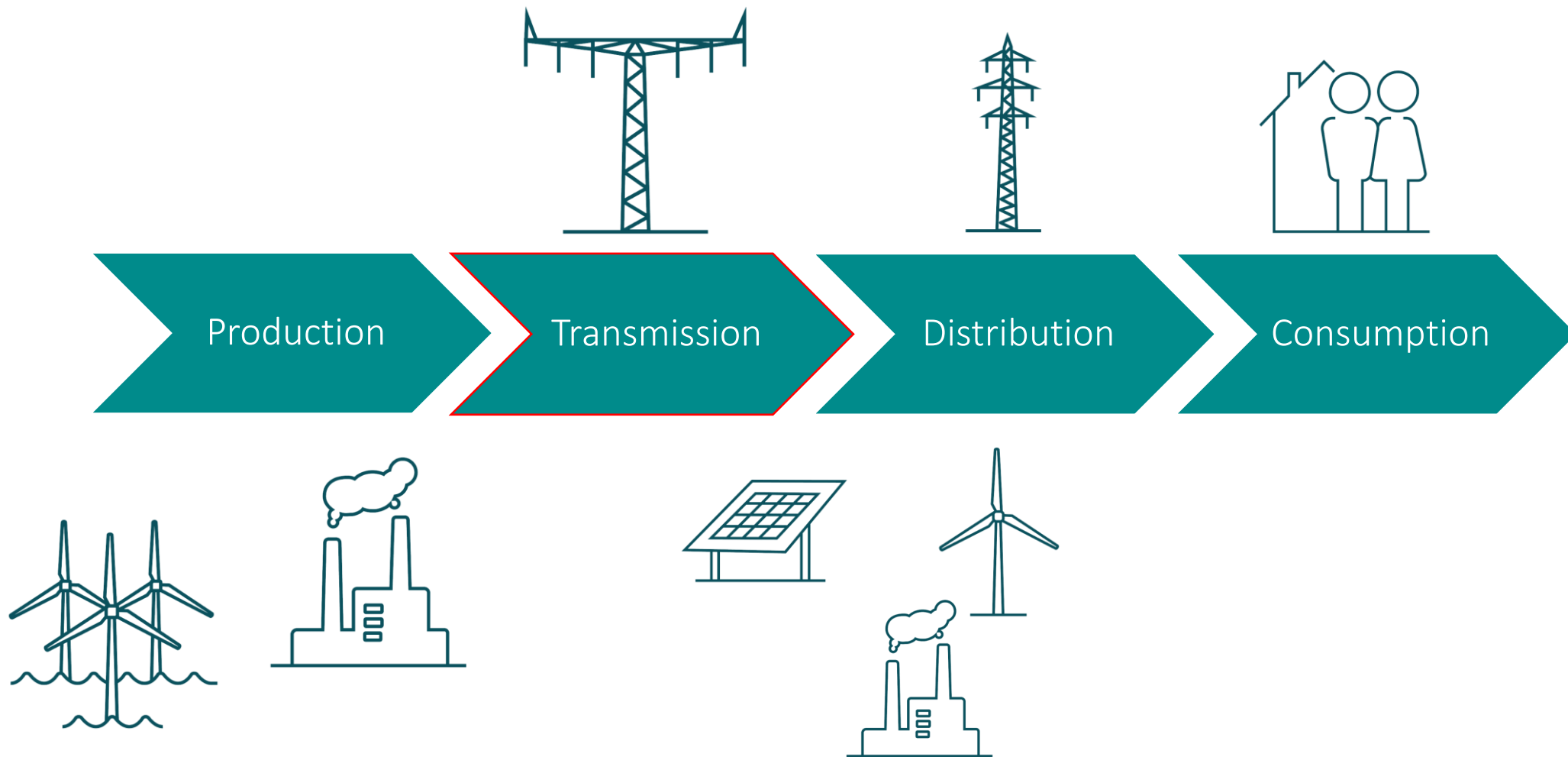
GAS TRANSMISSION SYSTEM



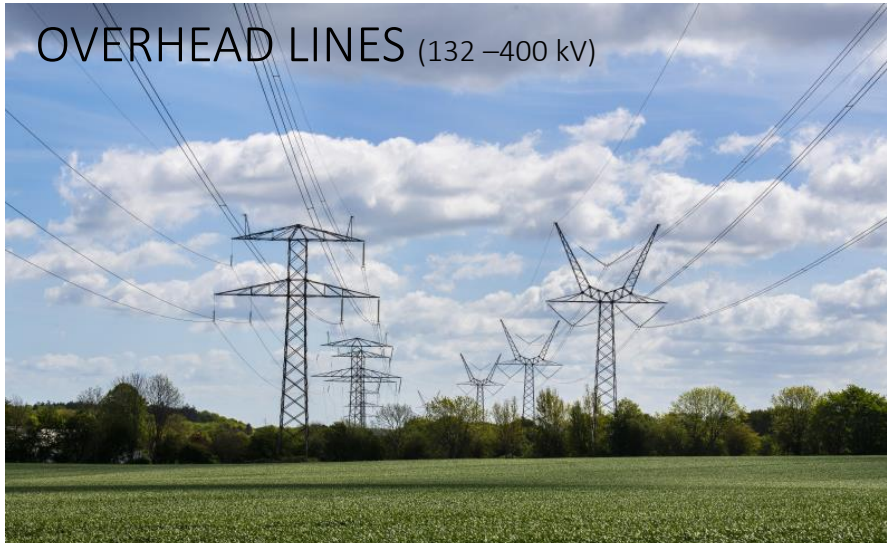
ELECTRICITY TRANSMISSION SYSTEM



ENERGY SYSTEM (SIMPLIFIED, ELECTRICITY ONLY)



TRANSMISSION GRID ASSETS





ENERGISYSTEMET – NU OG I FREMTIDEN

→ Hvad ser vi, og hvad betyder det?



GRØN OMSTILLING OG SEKTORKOBLING

→ Udnyttelse af potentialer på tværs af el og brint



PERSPEKTIVER FOR BRINTINFRASTRUKTUR

→ I Europa og i Danmark



FRA TYRA TIL MANGE BIOGASANLÆG



GW

50

40

30

20

10

0

SOL OG VIND SKAL FIREDOBLES PÅ KUN 8 ÅR

1984

1990

2000

2010

2020

2030

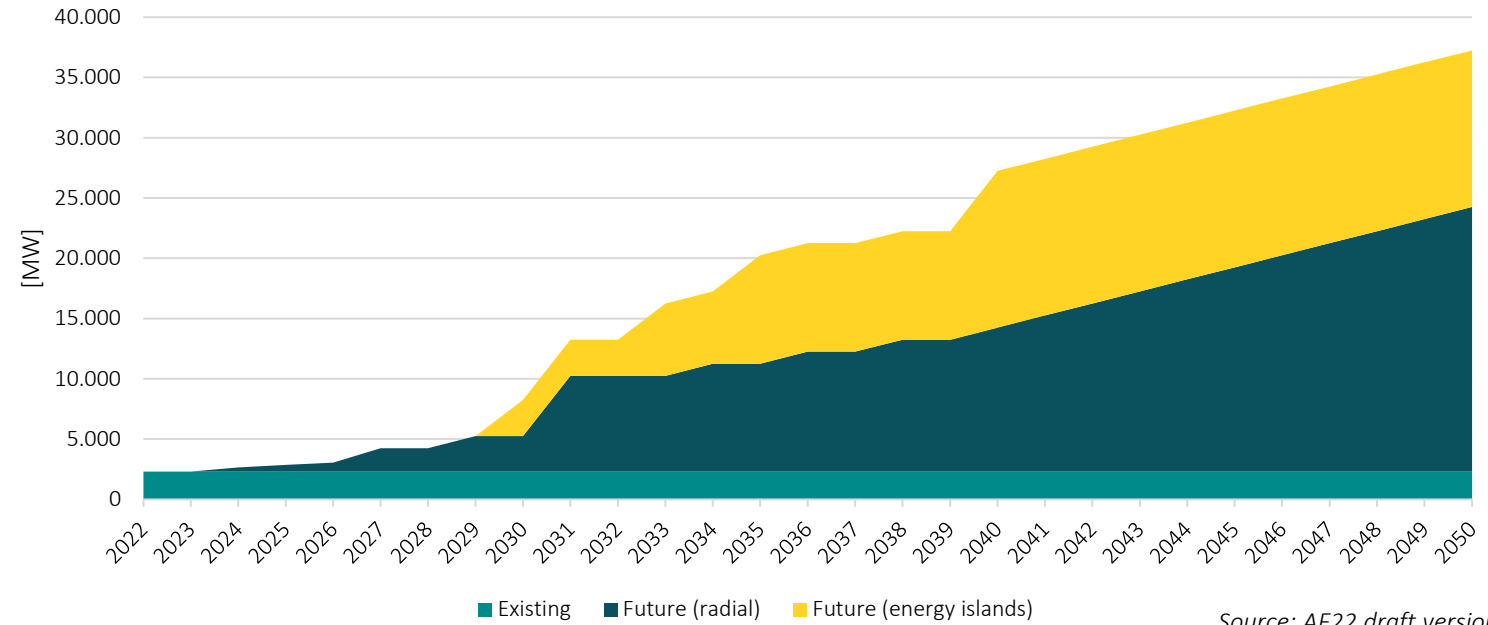
AF21



DANISH OFFSHORE WIND

- Danish offshore wind capacity increases from approx. 2 GW in 2022 to more than 37 GW in 2050
- The offshore wind capacity projection includes the offshore wind connected to the Danish energy islands
- In the same time span, solar pv capacity is projected to increase from below 2 GW to around 34 GW
- Danish offshore wind potentials exceed the electricity demand in a fully electrified Danish energy system.

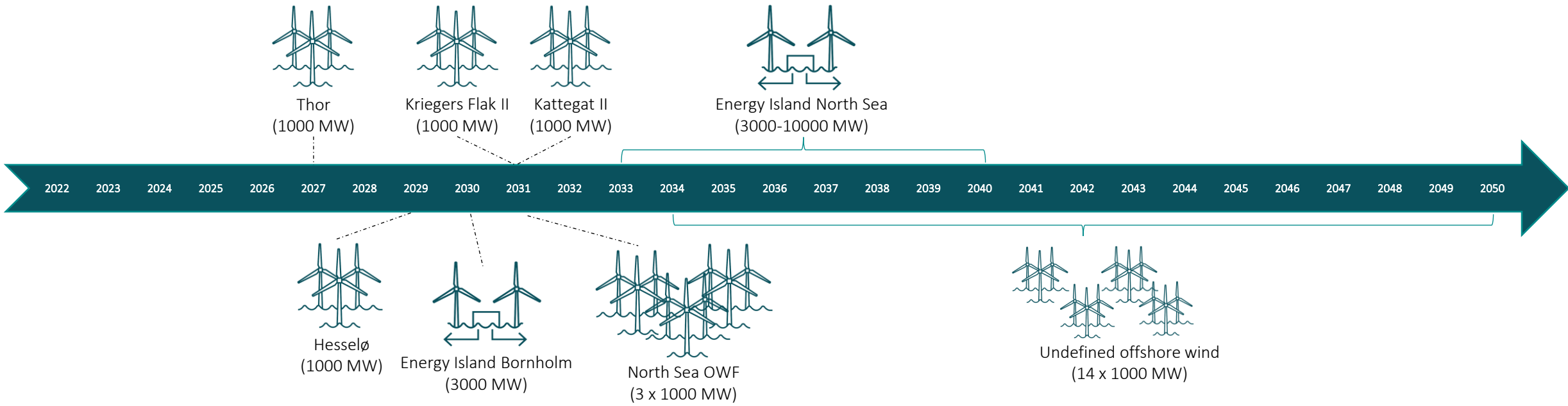
DK offshore wind capacity projection



Source: AF22 draft version

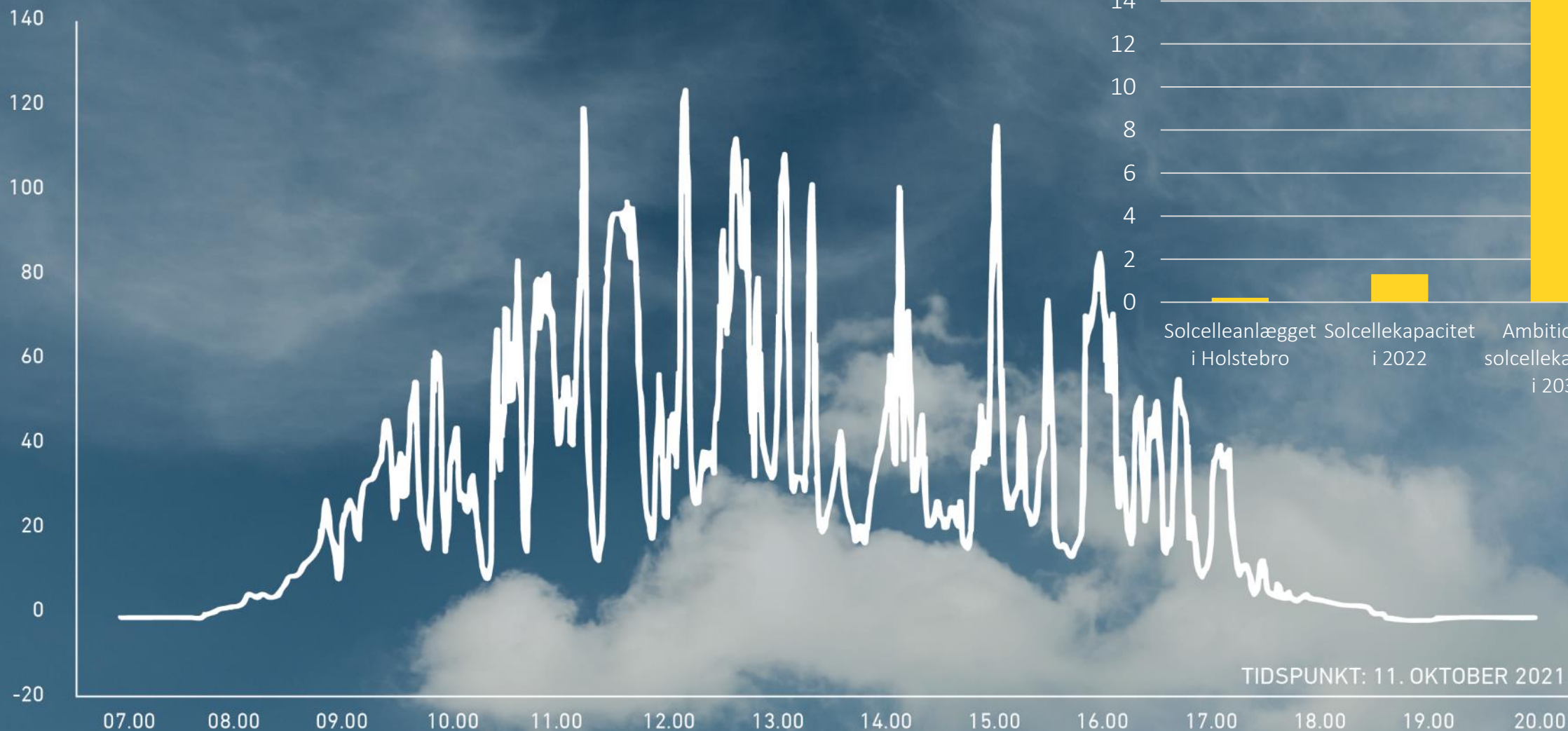
"Future (radial)" includes 600 MW open-door offshore wind from 2027

Major offshore wind projects in Denmark

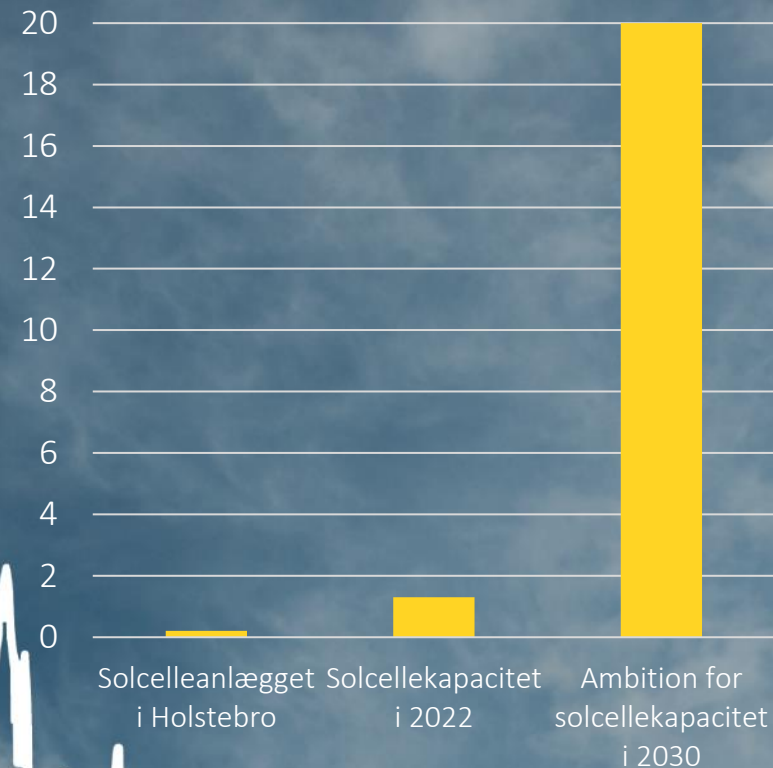


DRIVENDE SKYER UDFORDRER FORSYNINGSSIKKERHEDEN

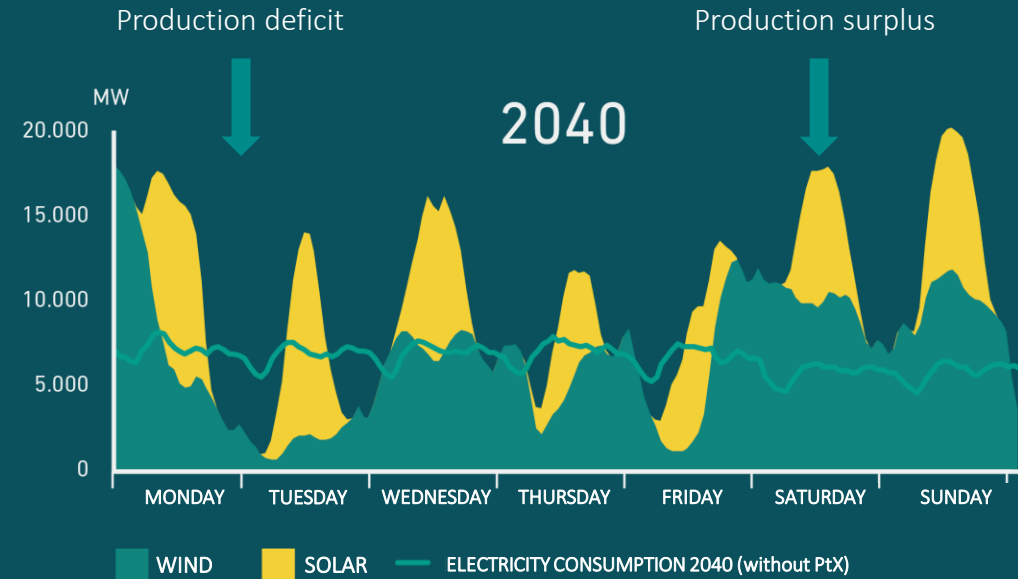
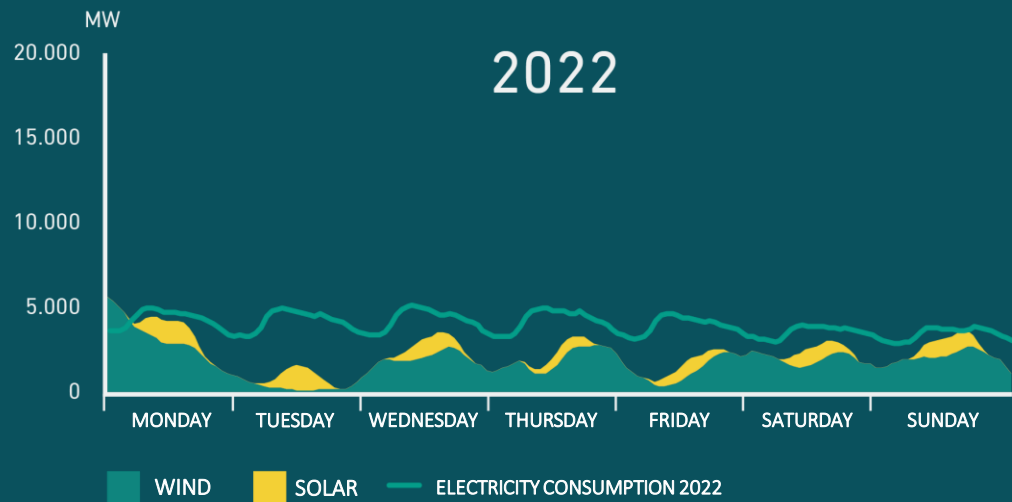
AKTIV EFFEKT (MW)



GW



CONSUMPTION AND PRODUCTION IS NOT ALWAYS PERFECT MATCH...



VIND OG SOL
SÆTTES OP, HVOR
DER ER PLADS



FORBRUGET ER
STØRST I BYERNE

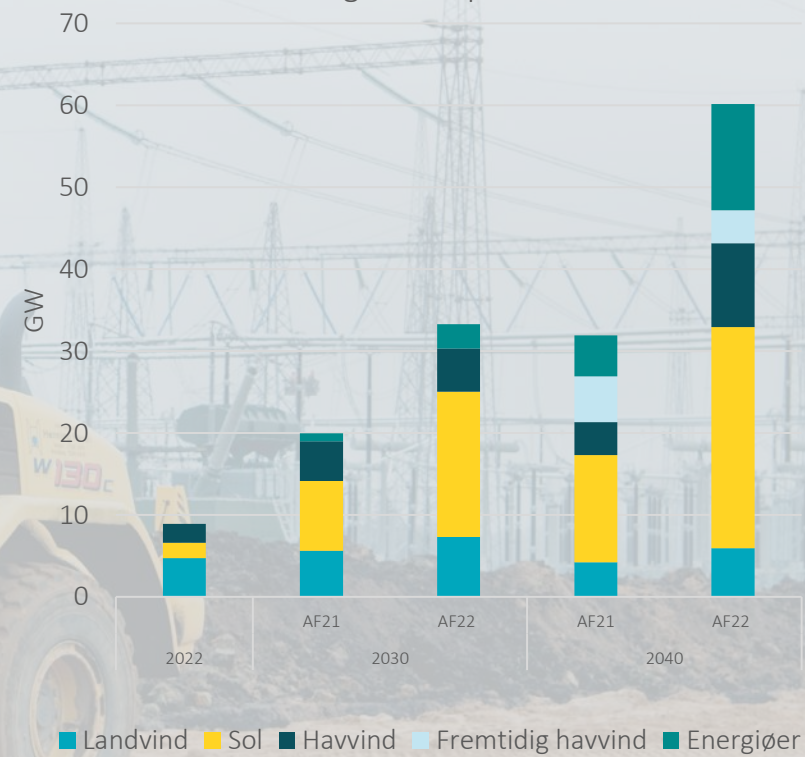




BIGGE- BOOM I ELNETTET

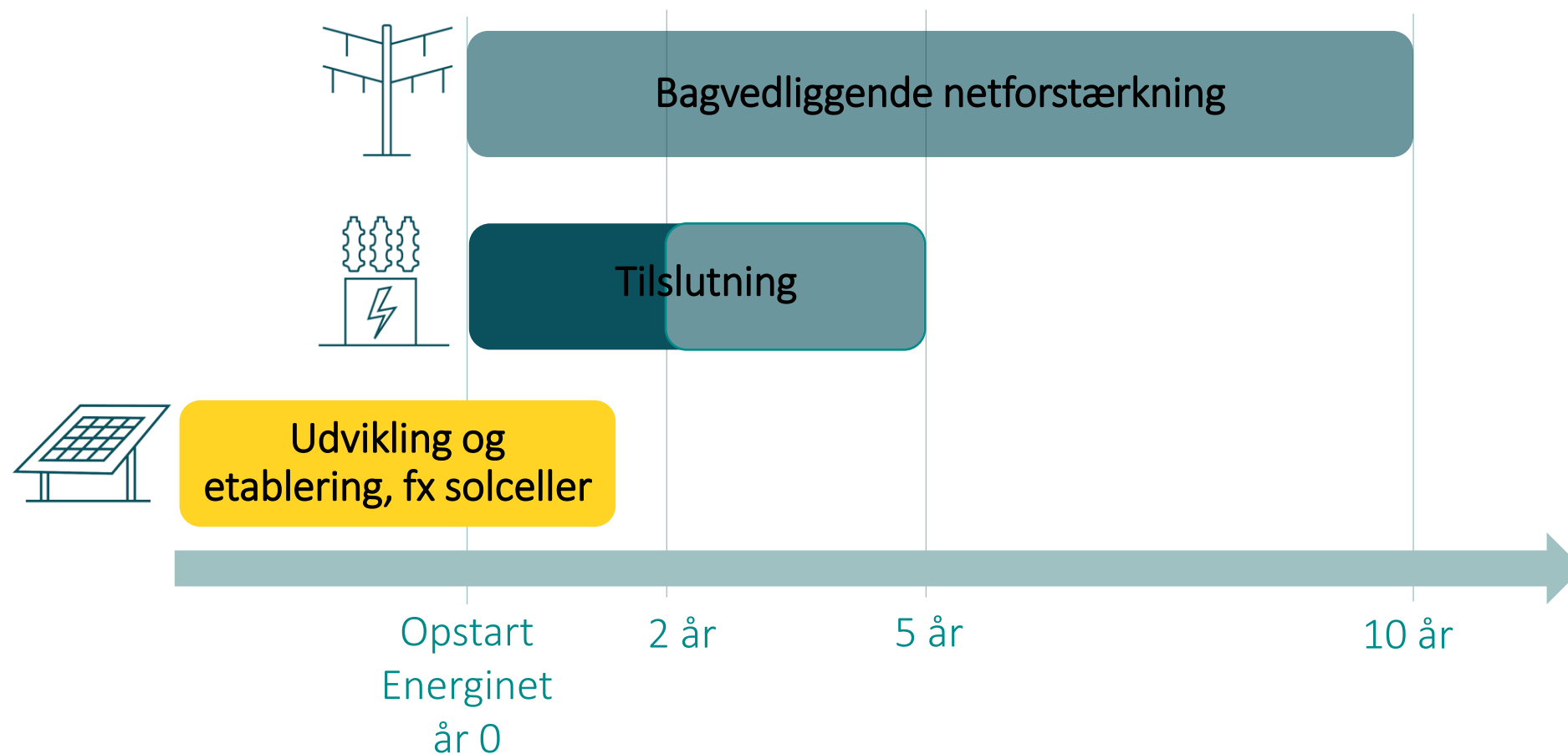
ENERGINET INVESTERER 25 MIA. KR I UDBYGNING AF ELTRANSMISSIONS- NETTET OVER DE NÆSTE 5 ÅR

Sol og vind kapacitet

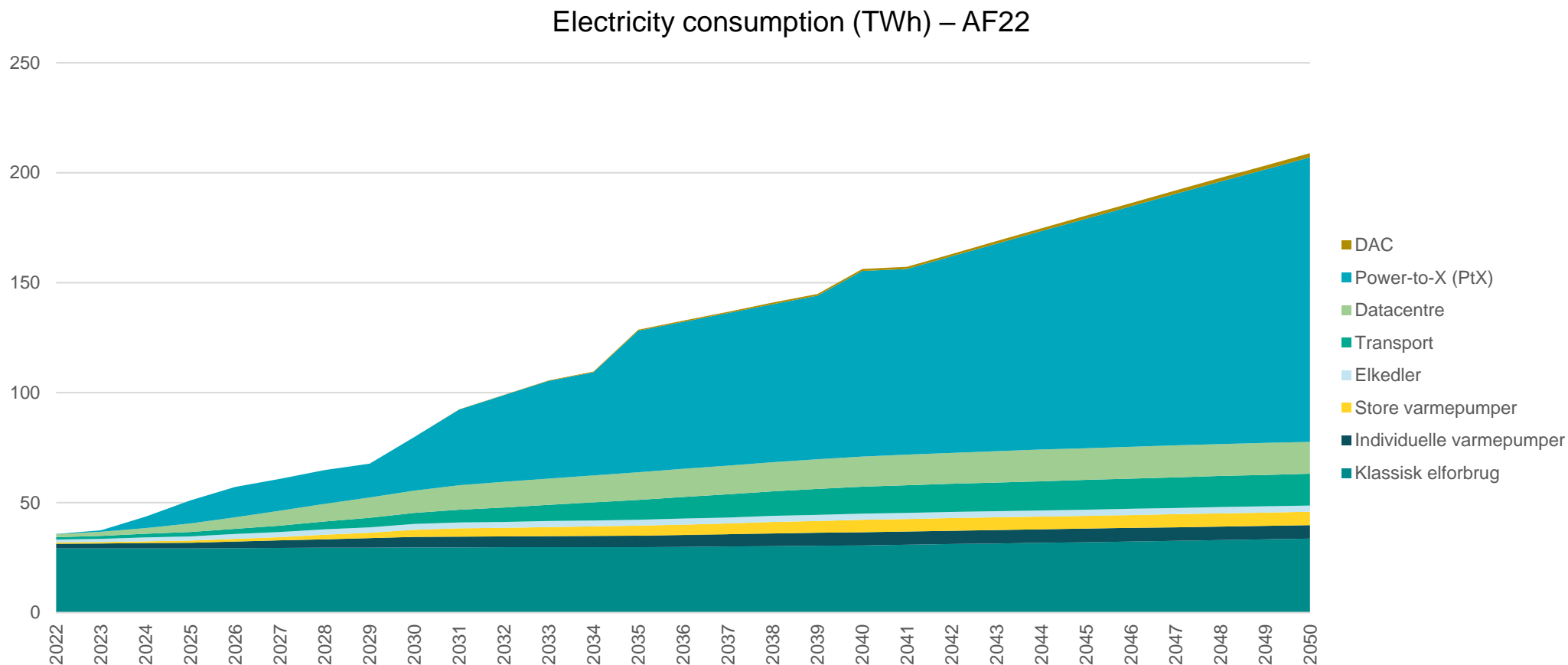


FORUDSÆTNING 1: NETTILSTRÆKKELIGHED

Hastighed er en udfordring, så (nogenlunde) geografisk nærhed har stor betydning



THE ELECTRICITY CONSUMPTION WILL INCREASE DRASTICALLY IN THE COMING DECADES





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GRØN OMSTILLING OG SEKTORKOBLING

→ Udnyttelse af potentialer på tværs af el og brint



PERSPEKTIVER FOR BRINTINFRASTRUKTUR

→ I Europa og i Danmark



ELEKTRIFICERING OG POWER-TO-X

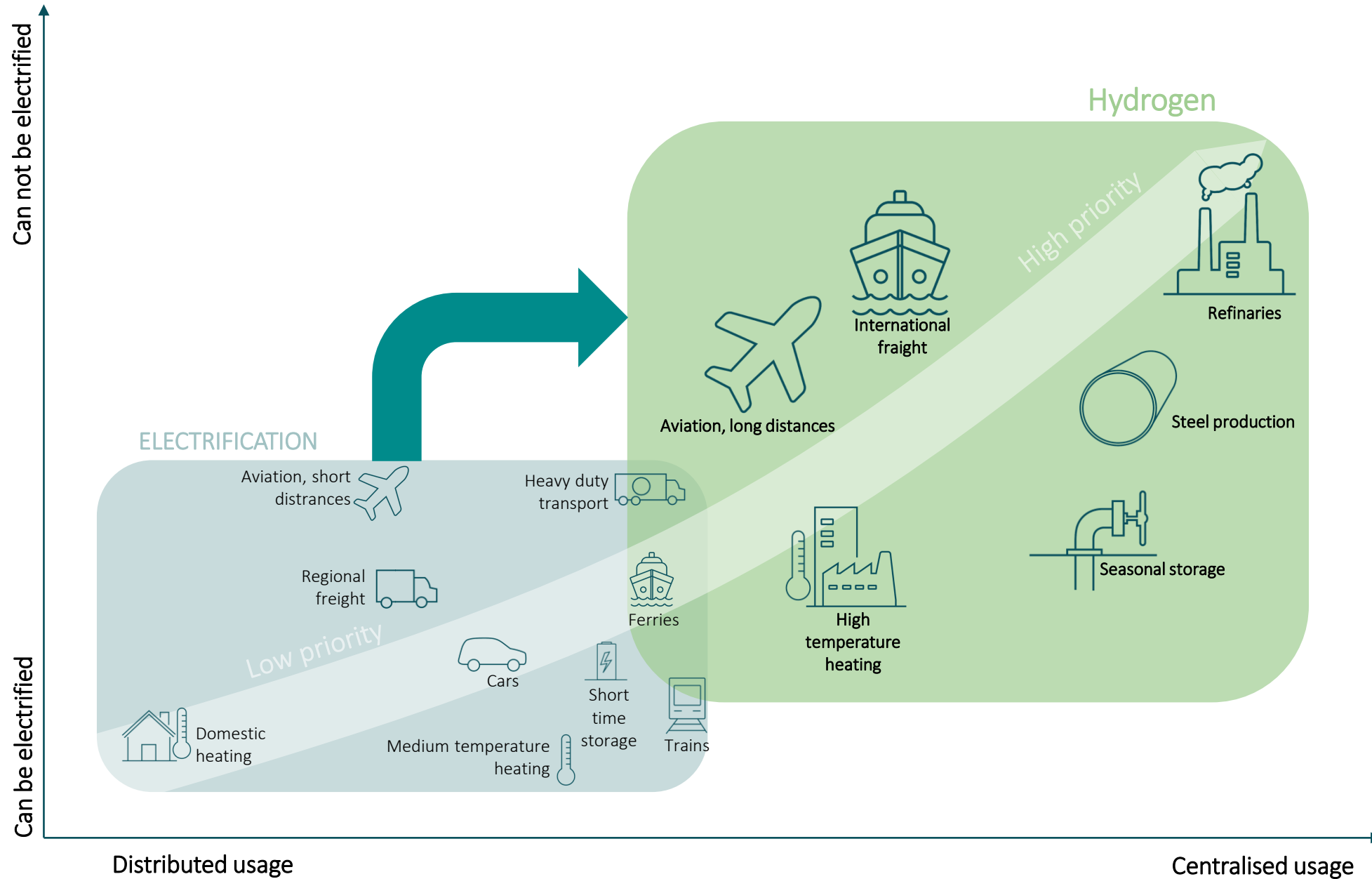
Danmarks store VE-potentialer kan bruges til direkte elektrificering og til indirekte elektrificering via Power-to-X til sektorer, der ikke kan køre på el..



DIREKTE ELEKTRIFICERING

INDIREKTE ELEKTRIFICERING (PTX)

Potentiale af brintanvendelser



IF MÆRSK'S TRIBEL-E CONTAINER SHIPS HAD TO BE PROPELLED BY GREEN FUELS; HOW MANY CONTAINER SHIPS WOULD HORNS REV 3 (407 MW) BE ABLE TO SUPPLY ENERGY TO?

A. 2?

B. 10?

C. 30?

It would require around 50 GW of offshore wind to supply Mærsk's entire fleet of container ships with green ammonia.





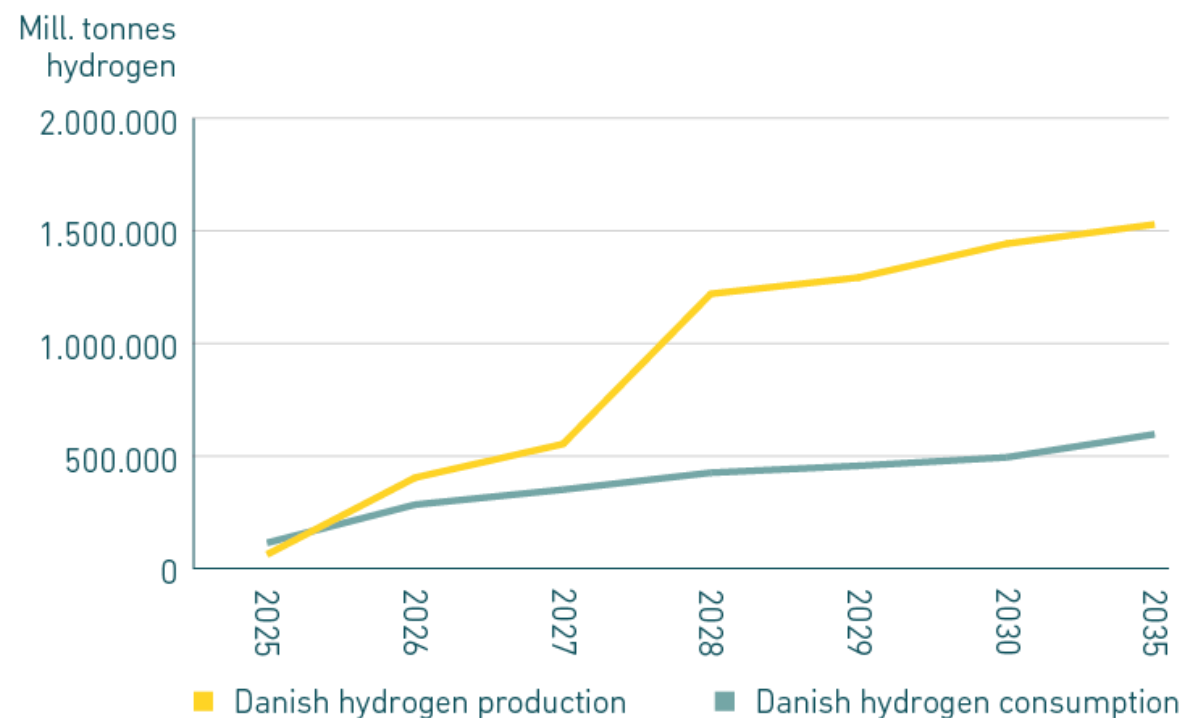
Hydrogen is an important element in a green energy system characterised by security of supply.

Balancing the electricity system

Hydrogen also has a large potential for exports to Europe.

This presupposes that it can be traded across borders.

HYDROGEN FOR BALANCE AND EXPORTS





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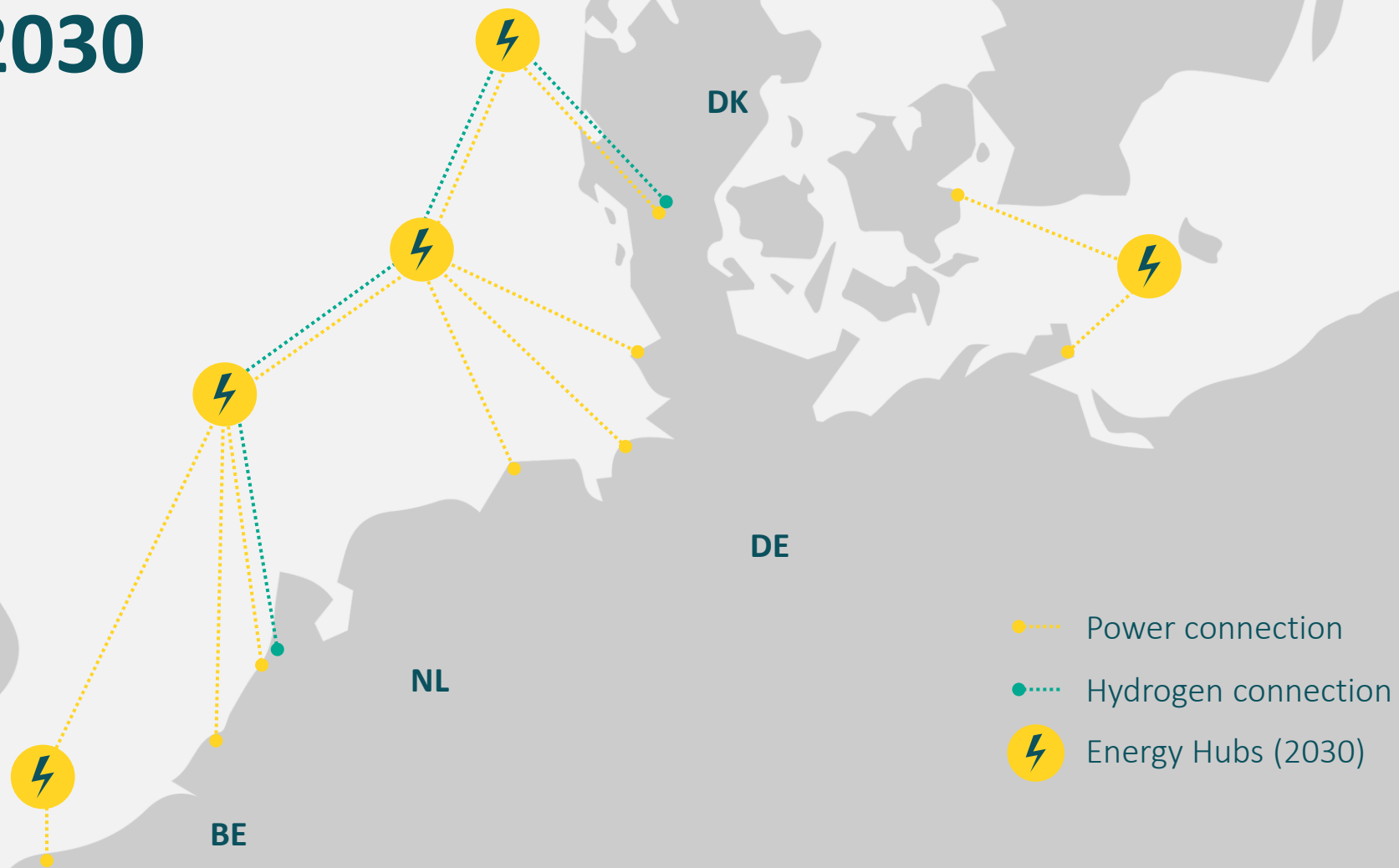


PERSPEKTIVER FOR BRINTINFRASTRUKTUR

→ I Europa og i Danmark

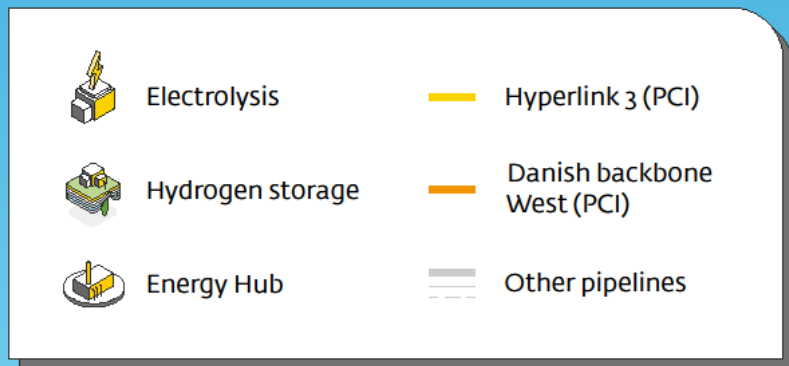


HIGHWAYS OF THE FUTURE SCENARIO 2030



H₂ Network Germany & Denmark

Hyperlink 3 (PCI) + Danish backbone West (PCI)



TSO'ERNES VISION OM

“EUROPEAN HYDROGEN BACKBONE”

European Hydrogen Backbone vision for 2040

Træk

