

ENGINEERING
TOMORROW

Danfoss



Elektrificering af den maritime industri

Danfoss Drives

Jens-Christian Strate

jst@danfoss.com

Helge Vandel Jensen

helge@danfoss.com

Ren Luft Webinar 17. marts 2021

Danfoss introduktion



Danfoss Power Solutions

#2 Market position

- 7,826 employees
- 28 factories in 12 countries
- 2.2bn EUR annual sales



Danfoss Climate Solutions

#2 Market position

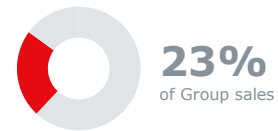
- 10,792 employees
- 32 factories in 15 countries
- 2.6bn EUR annual sales



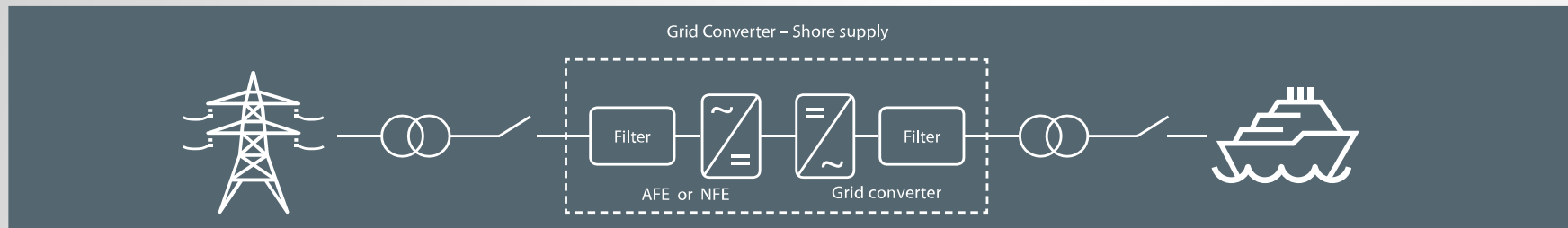
Danfoss Drives

#2 Market position

- 4,504 employees
- 10 factories in 7 countries
- 1.5bn EUR annual sales



Landstrømsanlæg giver ren luft i bynære havne



Maersk Supply Service, Fredericia

Total
step to local pollution from diesel exhaust

- Shore power supply is a 200% efficient solution for Maersk Supply Service's market needs at Fredericia, Denmark
- Minimizes diesel exhaust pollution, noise nuisance and maintenance costs

Port of Scheveningen

1000
litres less diesel consumed every day

Scheveningen harbor environmentally upgrades with shore power

On average, 1,000 Maersk Supply Service's ships are berthed every day locally at the new shore power supply in Scheveningen harbor, resulting in:

- Dramatic reductions in air pollution by particulate matter, nitrogen oxides (NOx) and sulfur oxides (SOx)
- Substantial CO2 savings
- 100% renewable energy

Coast Center Base, Bergen

Shore supply to rigs ensures fuel savings and cleaner air

- 5000 liters less diesel consumption daily while berthed at the coastal base
- 4500 tonnes less CO₂ and NO_x emission annually
- Easy connectivity
- Prepared to meet future legal requirements
- Optimal user interface for easy operation

5000
litres of diesel fuel saved daily

FAYARD shipyard, Odense

2 months
reduced maintenance

Electric shore supply system responds to peak demands with high efficiency

FAYARD Shipyard in Odense, Denmark, converted from diesel generator based power to an electric shore supply system using VACOMM RIG Air Cooled drives, resulting in:

- Less emissions and reduced noise
- Reduced energy costs
- Elimination of housing and maintenance costs for diesel generators

Ærøfærgeren Ellen - verdens kraftigste elfærge



- Elfærge med rækkevidde på 22 sømil og normal fart på 13 knob
- Kapacitet: 196 passagerer og 31 personbiler
- 3,8 MWh batteri, som kan oplades med 4MW peak
- Danfoss power converters og PM motorer
- Bygget på Søby værft i 2019 som EU-financieret E-Ferry projekt

Stena Jutlandica - eftermontage af 1MWh batteri til havnemanøvrering

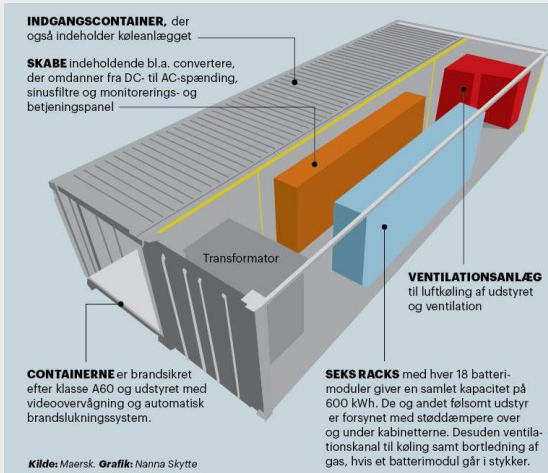


Første skridt i Stena Line's elektrificeringsstrategi:

- 1MWh batteri til manøvrering og styring af bovpropellerne, når færgen er i havn. Batterierne lades op med grøn landstrøm i Göteborg Havn og fra diesel motorerne under drift
- CO₂-reduktion på 1.500 ton om året siden 2019
- Danfoss power converters



Eftermontage af batteri til peak shaving – Maersk Cape Coast



- Maersk Cape Coast – 4500TEU containerskib
- Batteriet gør det muligt at slukke 2 ud af 3 hjælpegeneratorene (Lav last = dårlig virkningsgrad)
- 600kWh samlet batterikapacitet
- Maksimal effekt 1800kW
- Danfoss power converters
- Bygget i Danmark af Trident Maritime Systems.
- Taget i drift i 2021.

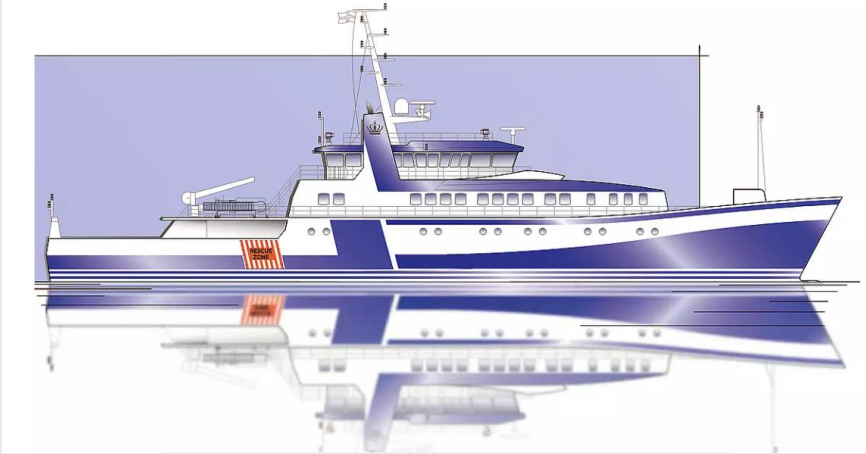
Fanølinjen (Molslinjen) – **Elfærgen Grotte**



- Samme design som dieselfærgerne Menja og Fenja
- Kapacitet: 300 passagerer og 35 personbiler
- 2 x 375kW elektrisk fremdrift med Danfoss power converters og PM motorer
- Lader med 2,6 MW i 8 minutter i Esbjerg
- Under bygning på Hvide Sande Shipyard. Sættes i drift i sensommeren 2021

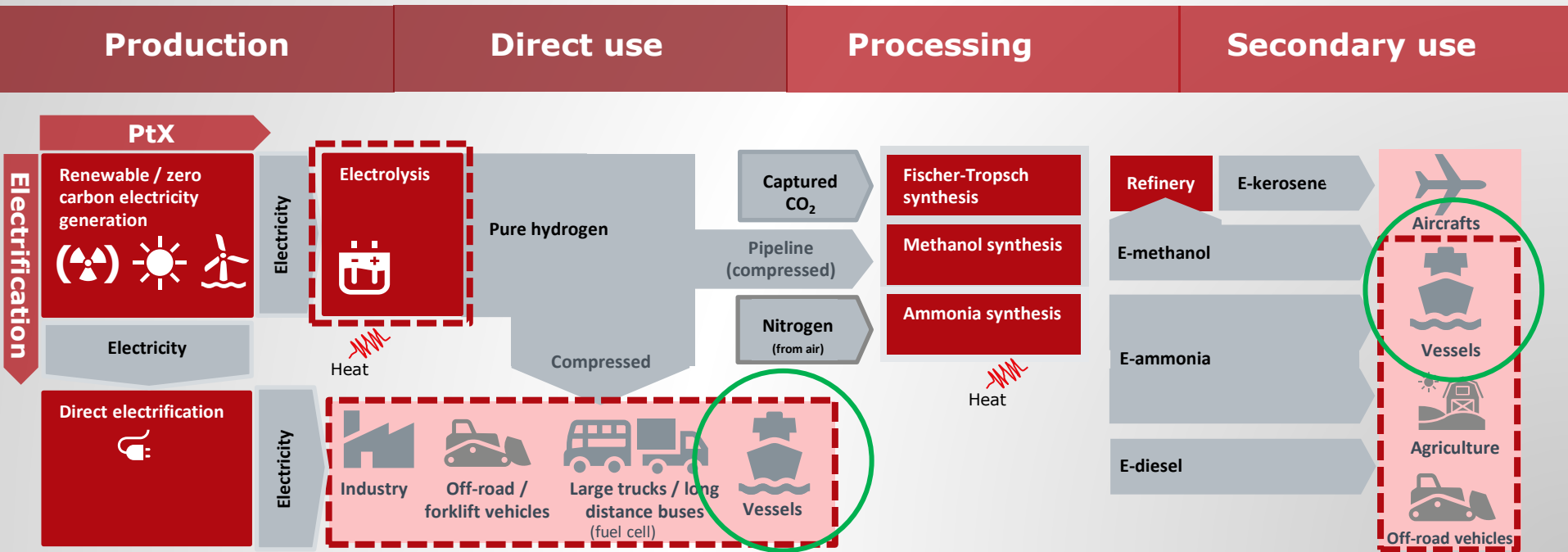


Diesel-batteri hybrid inspektionsskib - Vestkysten



- Nyt inspektionsskib til Fiskeristyrelsen
- Dieselelektrisk hybrid fremdrivning med 600 KWh batteri
- Danfoss elektrisk design med power converters og PM motorer
- Bygges på Hvide Sande Shipyard
- Sættes i drift i 2022

Fremtidens maritime elektrifiseringsløsninger: Direkte elektrifisering, grøn brint og Power-to-X (E-fuels)





**ENGINEERING
TOMORROW**