

# Green Offshore Operations

Why carbon-neutral operations matter

Ørsted Offshore Operations



**Oluf Damsgaard Henriksen**  
24 November 2020

# Agenda

## The big “why”

Background – emission sources and trajectories

Offshore enablers

Offshore stepping stones

Offshore zero carbon technologies



## Loving your home requires action!



**Ørsted**  
Love your home

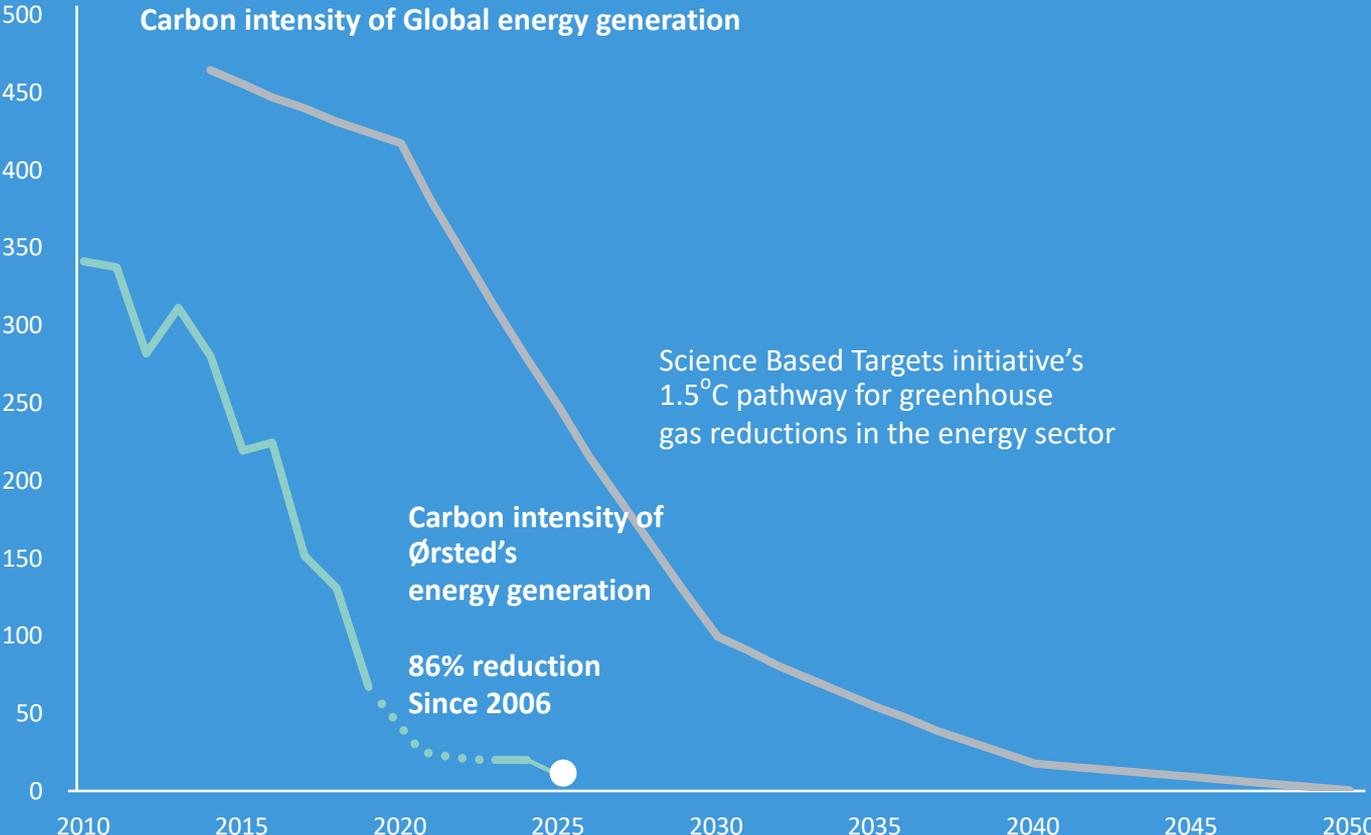
Scientific evidence requires the world to halve the global emissions by 2030. We need our energy systems to shift from a reliance on fossil fuels to using renewable, green energy.

We all have the responsibility to take action and start showing love for our home.

In Ørsted, sustainability is part of our corporate culture. We need to understand that all our actions have an impact, and we need to make our impact as light as possible.

# Carbon neutral operations by 2025

gCO<sub>2</sub>e/kWh



7 AFFORDABLE AND CLEAN ENERGY

8 DECENT WORK AND ECONOMIC GROWTH

13 CLIMATE ACTION

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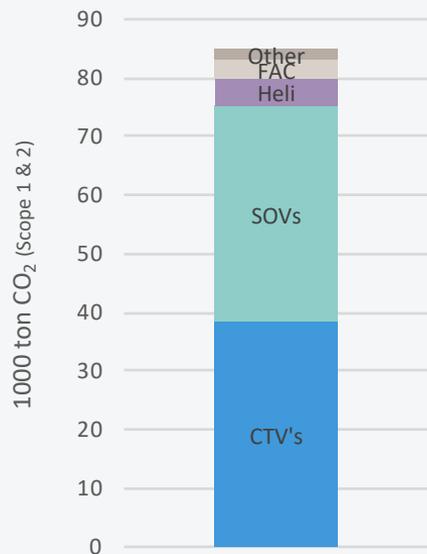
Offshore zero carbon technologies



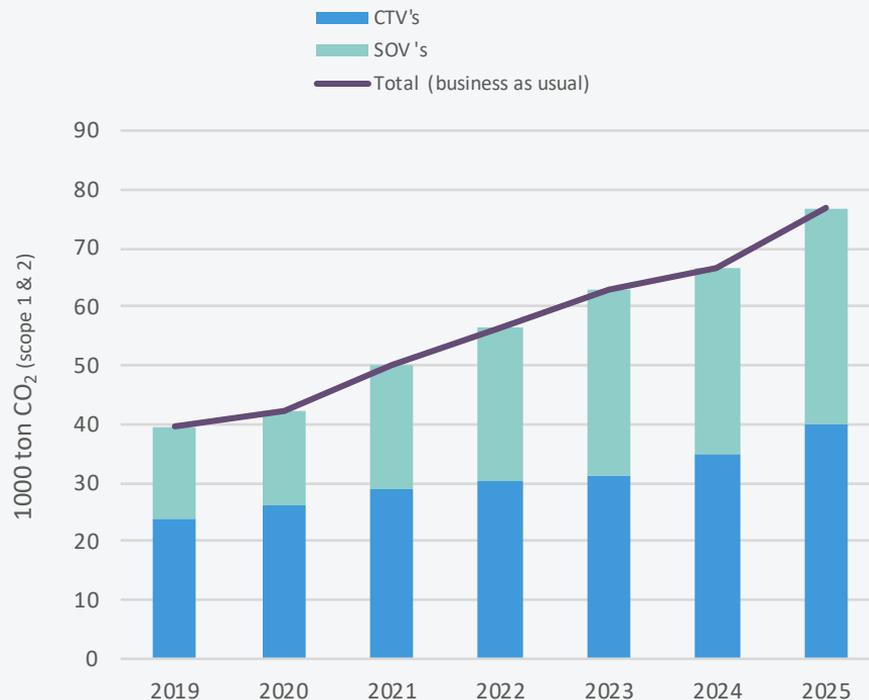
# In a business as usual scenario, CO<sub>2</sub> emissions in Operations Logistics will double in the period from 2019 to 2025



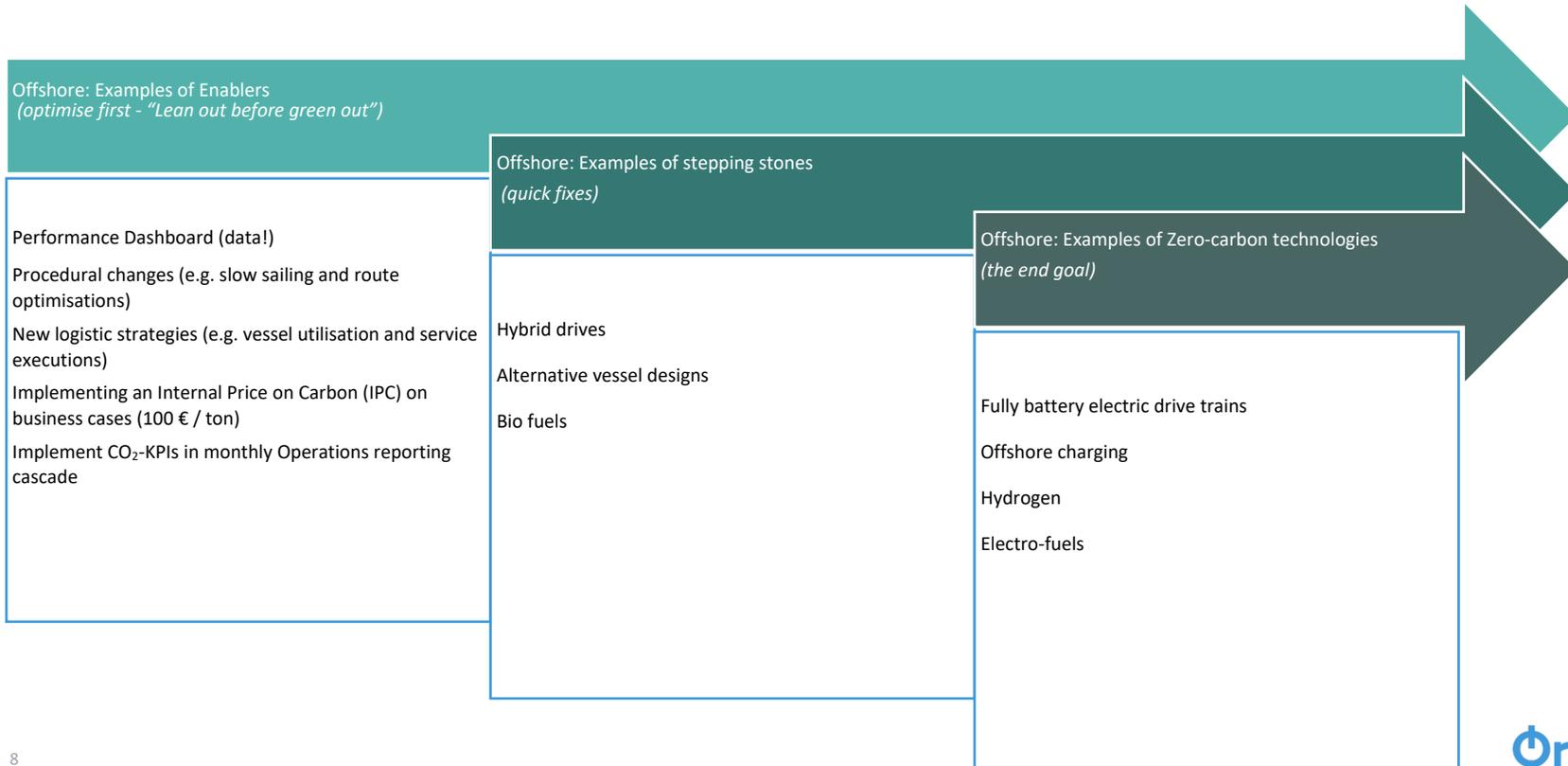
Estimated emissions in 2025 (business as usual)



Projected emissions 2019-25 (business as usual) – CTV's and SOV's



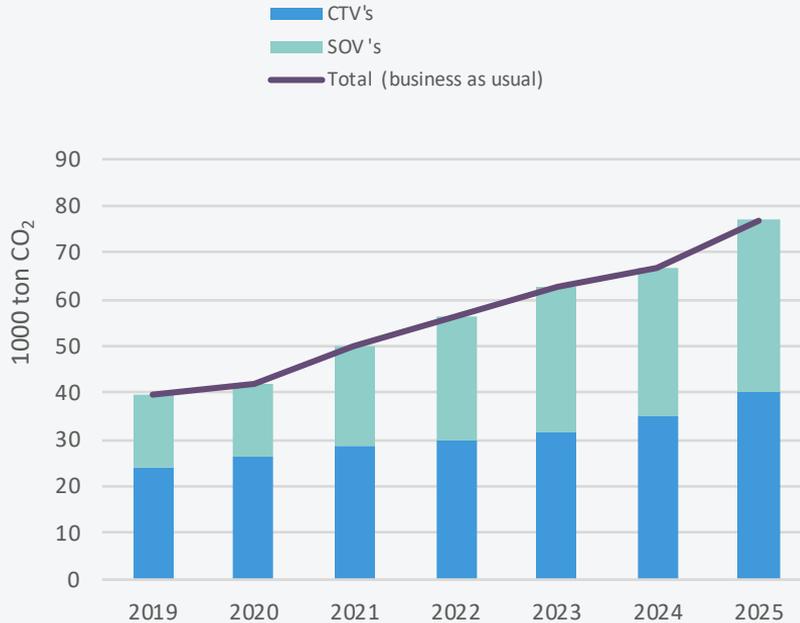
# The road to carbon neutral emissions in 2025 is a combination of short term optimisations and long term technology development



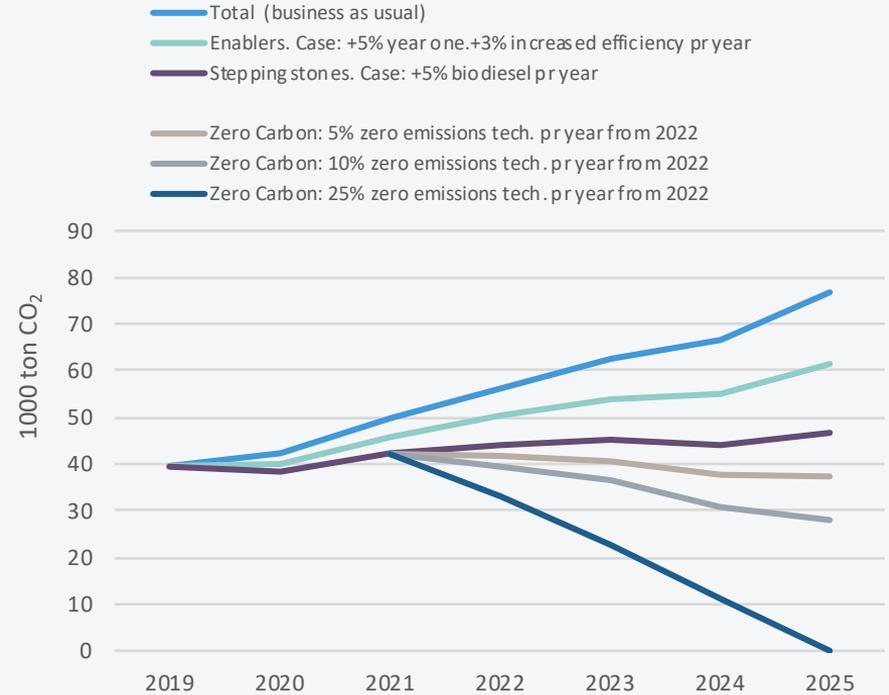
# Reduction in Operations' CO<sub>2</sub> emissions requires technology investments to meet the 2025 carbon neutral target



Projected CO<sub>2</sub> Emissions 2019-25 (business as usual)



Projected CO<sub>2</sub> Emissions 2019-25



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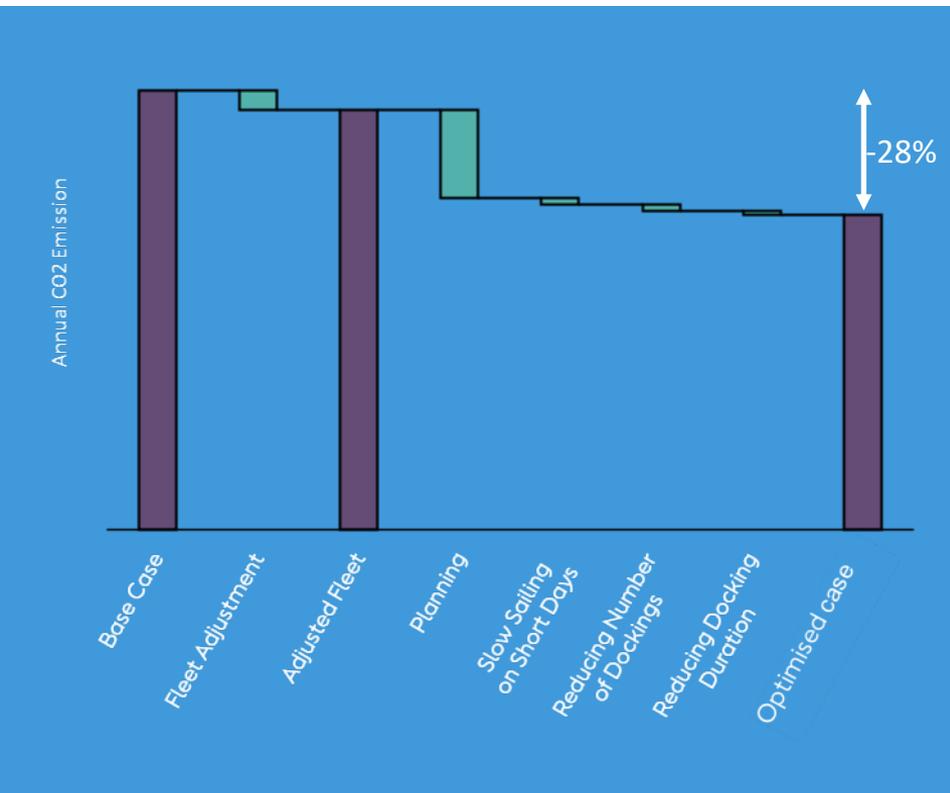
**Offshore enablers**

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# Good planning has the by far largest short term CO<sub>2</sub> reduction potential in our regions



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# We're continuing the push for optimised vessel designs and the use of biofuels



## Hybrid drives

- **Hybrid Surface Effect Ship (SES) / Sidewall Hovercraft** being prepared for delivery at Borssele Offshore Wind Farm (operations)
- Two **plugin hybrid CTV's** being delivered for Hornsea Two Offshore Windfarm (construction)

## Alternative vessel designs

- First BAR Technologies **hydrofoil design** ordered by Ørsted supplier (although not for Ørsted)

## Bio-fuels

- Cross-Ørsted **biofuel sustainability criteria** approved for tender purposes
- HVO Biodiesel **quotes are being** collected for EU and UK
- Specific bio-fuel case being developed for **Service Operations Vessels**



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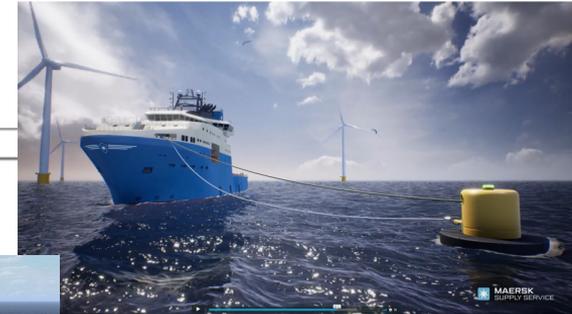
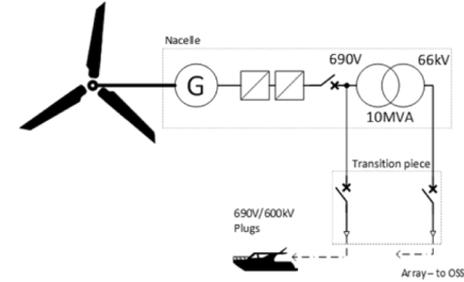
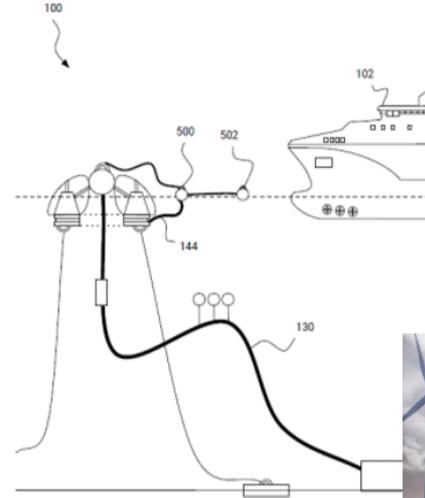
# The technology for battery electric drivetrains and offshore charging is feasible and available, but at high costs

## Battery electric drive trains

- **Battery electric** Crew Transfer Vessels and Service Operations Vessels are **technically feasible** and on the drawing boards – but they come with a hefty price mark-up

## Offshore Charging – Power Buoy

- Today's **battery technology is not sufficient** for full battery electric operation of service vessels
- **Ørsted and Maersk Supply Service** have joined forces to develop an **offshore charging station** to overcome the range limitations. The Power Buoy.
- Deployment of a Power Buoy prototype planned for **Q3 2021**



# Hydrogen and Methanol vessels are feasible and available, but supply chain for eFuels is still limited



## Hydrogen and methanol

- Hydrogen and methanol powered Crew Transfer Vessels are on its way to the market with dual-fuel combustion engines, running with diesel as pilot-fuel
- First hydrogen CTV to be delivered from Windcat to Vattenfall in 2022
- Several CTV and SOV suppliers have announced readiness to deliver hydrogen vessels
- Ørsted is running a cross-function investigation of the opportunities of running our fleet of service vessels using hydrogen and PtX as alternative fuels.

