

Wärtsilä 2022

Shaping the decarbonisation of marine and energy

Decarbonising the EU Fishing Sector

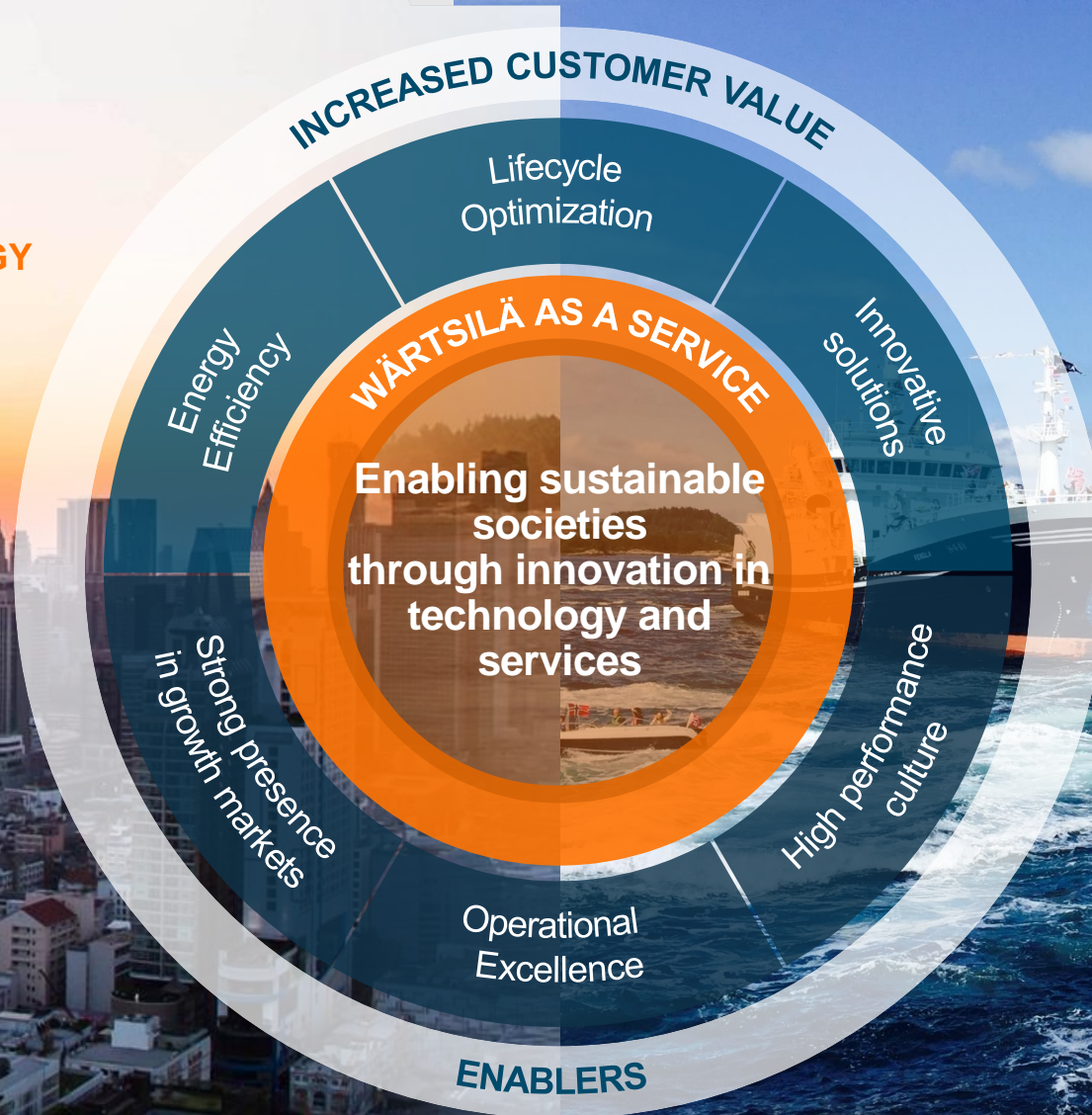
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General Manager Market Innovation
2022 June

ENERGY

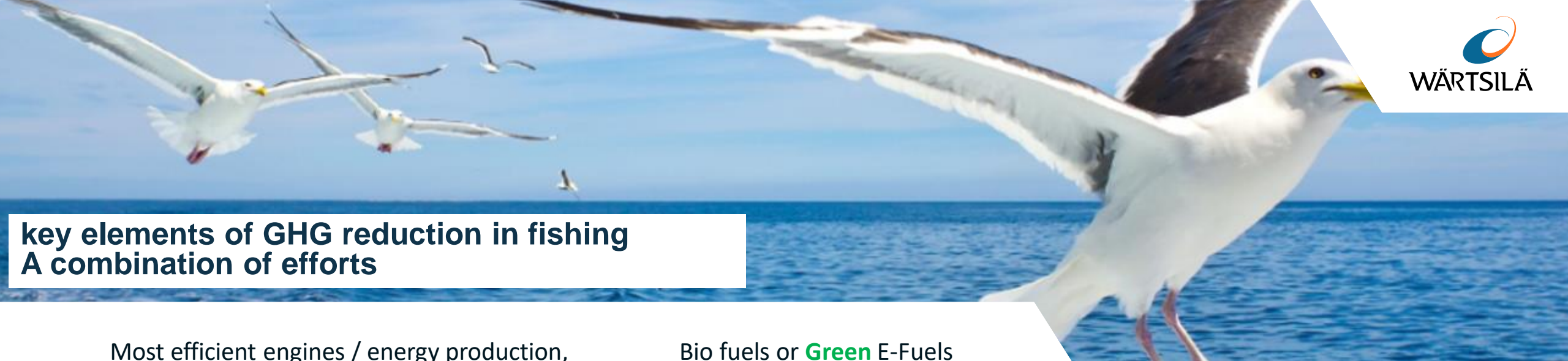
INCREASING DEMAND FOR
CLEAN AND FLEXIBLE ENERGY

MARINE

DEMAND FOR SMART AND
SAFE TRANSPORTATION



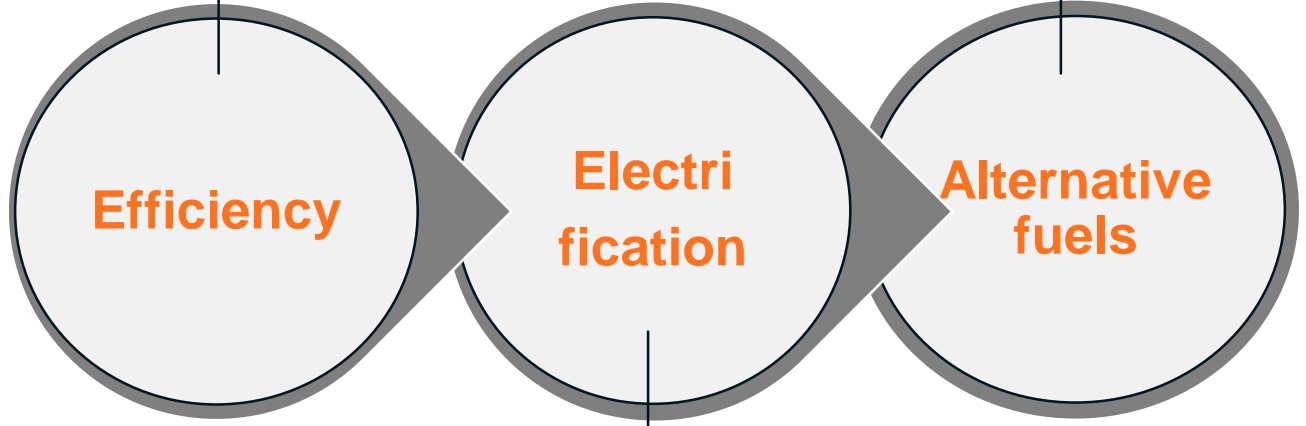
Fishing segment needs safe, efficient and sustainable solutions



key elements of GHG reduction in fishing A combination of efforts

Most efficient engines / energy production,
Optimized propulsion systems, propulsion
energy saving devices, multi speed gear

Bio fuels or **Green** E-Fuels
with low or Zero Carbon.
Methanol, Ammonia, H2

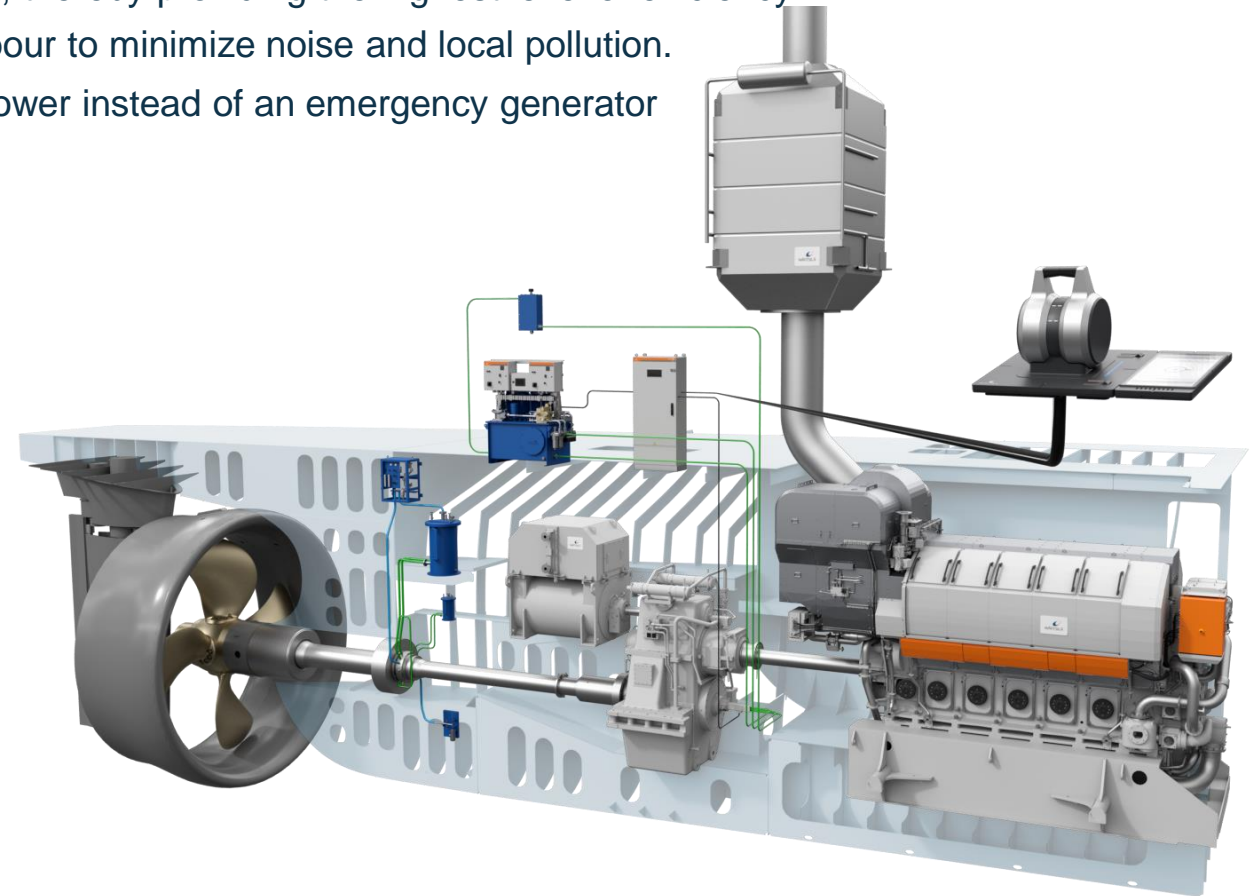


Shaft generator, Hybrid battery
systems, shore power connection

- Full electrification of vessels where possible small local fishing or fish farming (long haul applications, physics preclude the use of full electric ships)
- Lowest possible speeds and optimum routing (fish finding)

Shipyard: Cemre Marin Endustri AS
Hull Nos: NB65 / Fishing Vessel
End Customer: Hardhaus AS

- World class efficiency through most efficient 4 Stroke engine, 2 speed gearbox, integrated propulsion OptiDesign supported with Hybrid battery system.
- Notable environmental gains are made possible by a Wärtsilä hybrid propulsion solution supported by batteries, which results in very low emission levels. By absorbing most of the engine's load fluctuations through batteries, the engines can be operated close to its optimum design point, thereby providing the highest level of efficiency
- The vessel can operate on battery in manoeuvring and in harbour to minimize noise and local pollution.
- The battery system will be used as an emergency source of power instead of an emergency generator



EXAMPLE - AKER BIOMARINE MULTIPURPOSE KRILL TRANSPORT VESSEL



Eco Control System
Wartsila Pro Touch Bridge Control System

Electrical Systems
WIAS, Hybrid Battery system, EMS, Switch boards, Power drives for thrusters, Alarm system, FTC, UPS



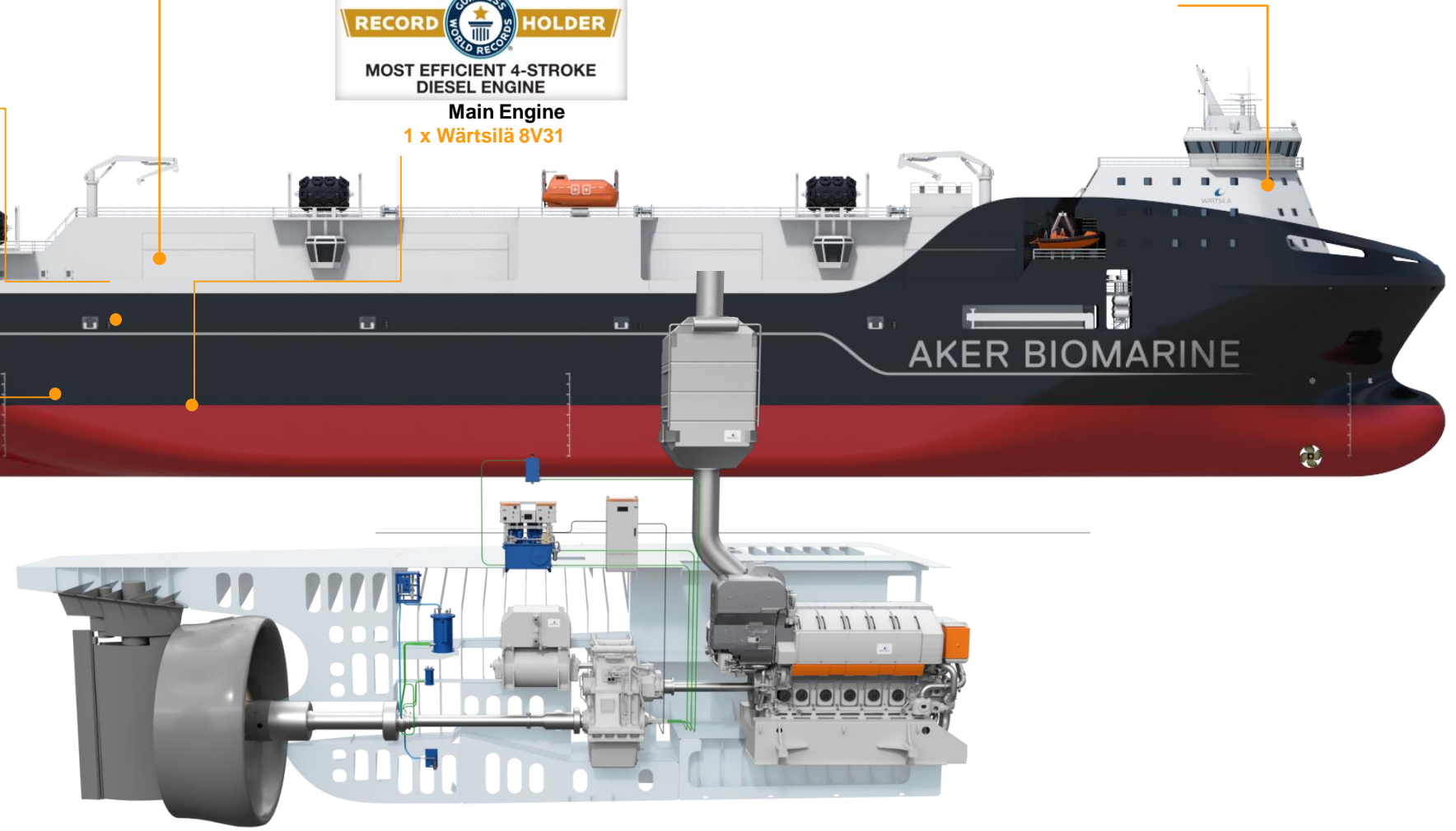
Main Engine
1 x Wärtsilä 8V31

Wartsila NOx Reducer system



Controllable Pitch Propeller Plant
1 x Wärtsilä WCP 4D1095

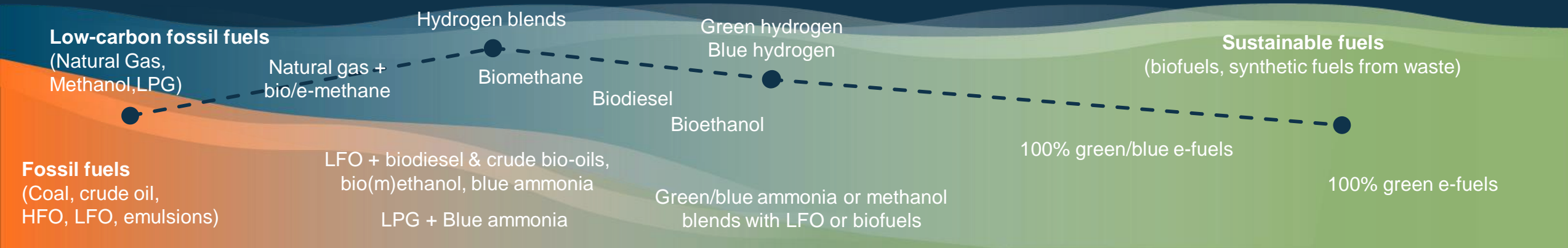
Shaft generator/Electric motor
PTO/PTI
1 x 1500kW/1500kW



TRANSITION TO GREEN FUELS WILL FOLLOW THE PACE OF THE ENERGY TRANSITION, CUSTOMERS NEED TO INVEST IN FUEL FLEXIBILITY TO AVOID RISK OF STRANDED ASSETS

Fishing segment will follow the available fuel infrastructure

TRANSITION FUELS ► DROP IN ► FUEL BLENDS ► NET-ZERO-CARBON FUELS



2021

Fossil-Dominated Fuel Portfolio



2025

Transition Fuels & Drop-in



2030

Decarbonising Fuels & Fuel Blends



2040

Net-Zero-Carbon Fuels



2050

Sustainable Fuels

Marine will move with unprecedented speed towards decarbonisation

POLICIES & REGULATIONS

- IMO target: 50% less GHG emissions from shipping by 2050
- Access to capital: EU taxonomy, Poseidon principles and ESG
- Cost of carbon: carbon certificates e.g. EU Fit for 55, IMO carbon levy and local green policies
- Demand for decarbonisation of all sectors, driven by companies' environmental commitments to their customers and investors' push for sustainability targets

TECHNOLOGY

- Focus on carbon neutral and zero carbon fuels. Continued use of carbon fuels for many years, still
- Next steps in abatement technologies e.g. carbon capture
- Increase in battery systems, hybrids, and energy saving devices
- Focus on fuel efficiency, flexibility and use of data

Key take away

- Low/Zero carbon fuels will be vital for Decarbonisation
- Fishing will not determine the fuel infrastructure development. It will follow the footsteps of large Marine actors
- Ship technology is becoming more complex. Integration is key to successful functionality Engines, hybrid systems, fuel supply systems, emission abatement
- Space is limited
- Clear and harmonised regulations for Norway, UK , EU countries , otherwise there will be unfair competition

