



New Hybrid Vessels

Sustainability in Shipping

- ❑ Safety & Sustainability is central to every aspect of our business and our corporate responsibility.
- ❑ Safety and sustainability were considered from the outside of the design and managed at every stage.
- ❑ The International Maritime Organisation (IMO) has set a strategy to reduce emissions from ships by 2050.
- ❑ The Initial Strategy envisages a reduction in total Green House Gas emissions from international shipping and to reduce the total annual GHG emissions by at least 50% by 2050.
- ❑ Carbon Intensity Index - The CII is an in-service/operational efficiency indicator which measures a vessel's carbon intensity over time.
- ❑ EU Emission Trading Scheme – From January 2024 All ships entering an EU port will have to purchase and surrender ETS allowances per tonne of CO2 produced.

Designing in Safety

- ▶ Vessel
- ▶ Onboards services
- ▶ Crew welfare
- ▶ Customer safety and experience
- ▶ Emergency management
- ▶ Future proofing
- ▶ Food Safety
- ▶ Public Health



A double-ended design and two bridges on the ship, meaning that there is no need for it to turn around and reduces fuel use.

Panoramic sea views for passengers.

Outside deck areas to provide viewing platforms of the White Cliffs of Dover.



DOVER  CALAIS



Cutting fuel use by 40 per cent through a combination of fuel and battery propulsion.



The heat recovery system saves fuel which reduces the vessel's carbon footprint.



A power management system to close down parts of the ship when not in use.

Revolutionary new shape of hull for the English Channel and azimuth thrusters which increase manoeuvrability of the ship.



Future proofing anticipates the 'zero carbon emissions ship'.



Ship of The Future

P&O Pioneer is the most sustainable ship ever to service the English channel. Sister vessel Liberte will join her in Spring 2024.

Energy Storage System

- ▶ Pioneer has a hybrid propulsion system which includes an energy storage system (battery banks) to reduce fuel consumption, emissions and reduce maintenance. Cutting fuel automatically leads to reduced emissions, and the battery helps to optimise energy consumption.
- ▶ These ships are hybrid and the ESS optimises the energy consumption by running the engines at optimal load and storing excess energy for later use. The ESS is used for the following operations: -
 - Peak shaving - “Shave” the load peaks and operate engines at more optimum load.
 - Load levelling - Give the generators a smoother operation by reducing load variations.
 - Spinning reserve - Take a generator set offline and use ESS for reserve power.
 - Zero-emission and silent sailing - Take engines offline, burn no fuel, emit no exhaust, make no noise.

Optimised Manoeuvrability

- ❑ 4 x Azipod ABB Thruster Pods.
- ❑ 360 degree manoeuvrability.
- ❑ 20% fuel savings compared to conventional shaft driven.
- ❑ No requirement for rudders.
- ❑ No mechanical transmission. Power fed directly to motor inside pod.
- ❑ Dynamic positioning.
- ❑ Reduced Maintenance.
- ❑ Improved Safety through sustainability.





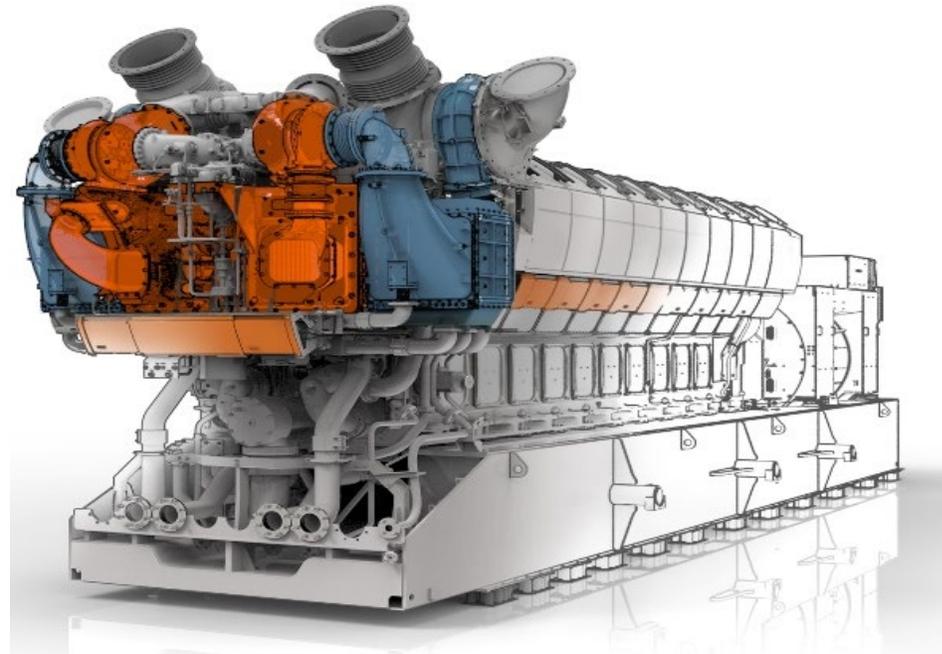
Largest Double Ended Ferry in Operation

- ❑ Calais end and Dover end, no forward or aft.
- ❑ No requirement to turnaround in port improving safe access and egress.
- ❑ Reduced fuel consumption and quicker crossing. Reduced emissions.



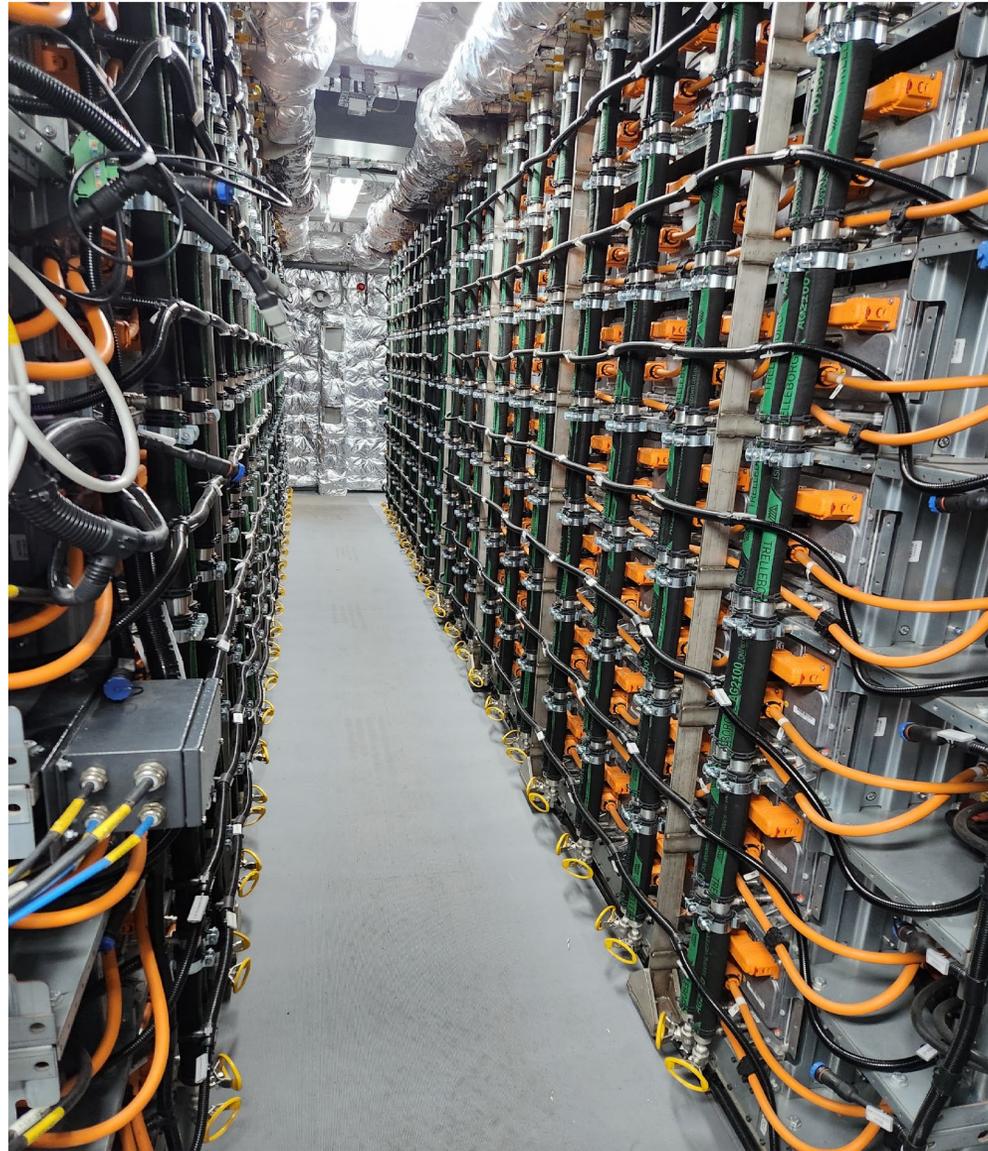
Other Emission Reduction Technologies Onboard

- ❑ Exhaust gas heat recovery.
- ❑ Power Management System.
- ❑ Variable Frequency Drive Motors.
- ❑ Sea Water Cooling for HVAC.
- ❑ Optimised Hull design.
- ❑ Low resistance hull coating.
- ❑ Most efficient marine engines currently in operation.



Battery Fire Risks

- ❑ Risk introduced from vessel battery banks and increasing numbers of EVs.
- ❑ Risk reduced by removal of multiple hot fuel burning engines/generators.
- ❑ Battery rooms protected by total drench system. Vehicle decks protected by Ultra-fog.
- ❑ EVs less likely to be source of fire than petrol/diesel cars.
- ❑ EV fire prevention centred around containment.



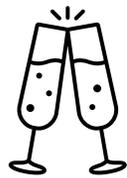
Safety onboard

- Walkways for pedestrian safety
- In-depth programme for vehicle deck safety
- Customer enjoyment and safety



Safety design at every stage

Including the naming ceremony



Is zero emission shipping
achievable?

