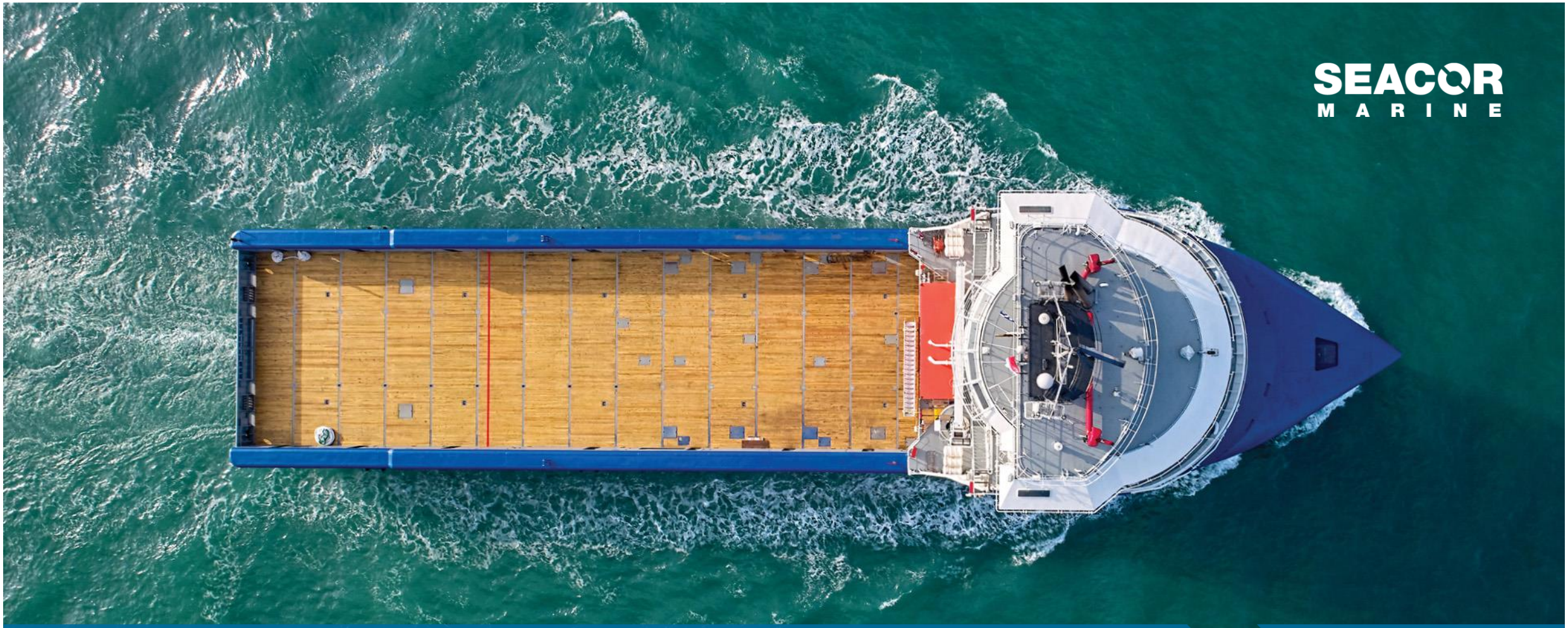


Annual Offshore Support Journal Conference February 2020

Our Customer's Words – Lower Carbon Emissions

"We recognize the significance of climate change, along with the role energy plays in helping people achieve and maintain a good quality of life. A key role for society – and for Shell – is to find ways to provide much more energy with **less carbon** dioxide."

"Increased energy efficiency and a shift to **lower carbon** energy sources will help curb CO_2 emissions, but not sufficiently to reach a 2°C pathway. Innovative technology solutions and supportive policies are still needed to achieve society's emissions aspirations."

ExxonMobil

"Equinor is committed to continue to play an active and positive role in society's **decarbonisation**, beyond our own operational emissions, through its engagement, technology, innovation, operations and investments."

equinor

"To deliver significantly **lower emissions,** every type of energy needs to be cleaner and better. A race to renewables will not be enough."

bp

Macro Trends in the OSV Sector

Increasing focus on reducing fuel consumption and carbon emissions

- Reducing carbon footprint of our customers

Growing activity in offshore wind

- “Mature” market of North Sea plus planned developments in Asia and the U.S.

Using new technologies to achieve “greener” operations

- Hybrid propulsion
- Dual fuel technologies

ALL avenues must be pursued

Changes in the OSV Sector

Industry contracting

- No new capital entering
- Insufficient operating returns to support/maintain current fleet
- No newbuilding orders for past several years and likely to continue

Increased vessel specialization and technical sophistication

- Wider variety of work roles –
  - Personnel transport
  - Offshore accommodation
  - Walk to work
  - Subsea maintenance
- Longer distances of supply chains to deepwater fields changes logistics

Growing requirements for local presence/registration

- Nigeria, Saudi Arabia, Mexico

Fewer owners operating fewer vessels of higher specification

SEACOR MARINE

Technology that Manages Fuel & Emissions

FOCUSED ON

sustained growth

OVER THE LONG TERM

Managing Fuel Consumption and Emissions

Real-time fuel monitoring and tracking

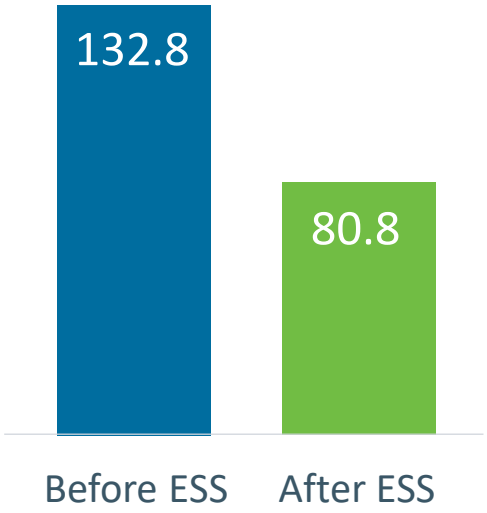
Managing Fuel Consumption and Emissions

- Adjust vessel speed and fuel consumption to meet operational requirements
- Rapid identification and correction of anomalies
- Optimize vessel loading and trim for best fuel performance

Case Study: SEACOR Azteca Fuel Consumption Savings

DP-2, 2 GEN (USG/Hr)

39.2% Reduction

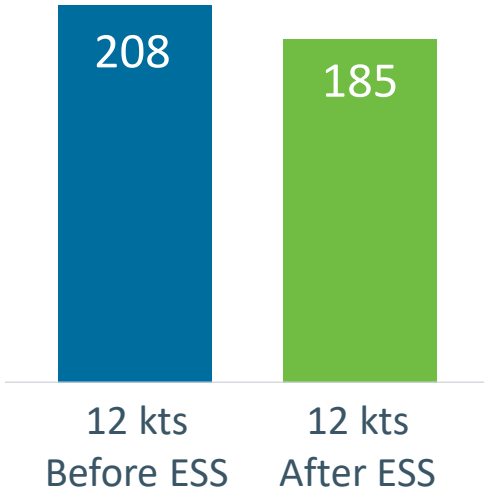


DP-2, 4 GEN (USG/Hr)

17.1% Reduction

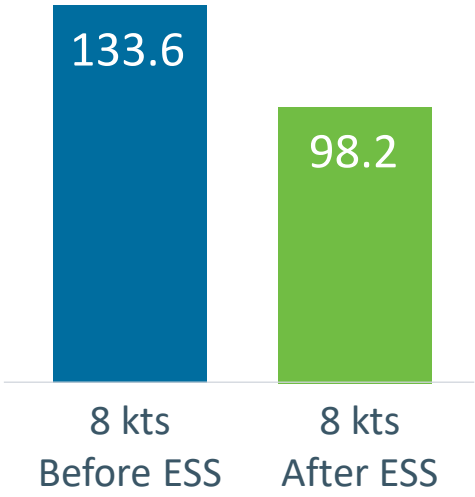
Dual GEN (USG/Hr)

11.1% Reduction



Single GEN (USG/Hr)

26.5% Reduction

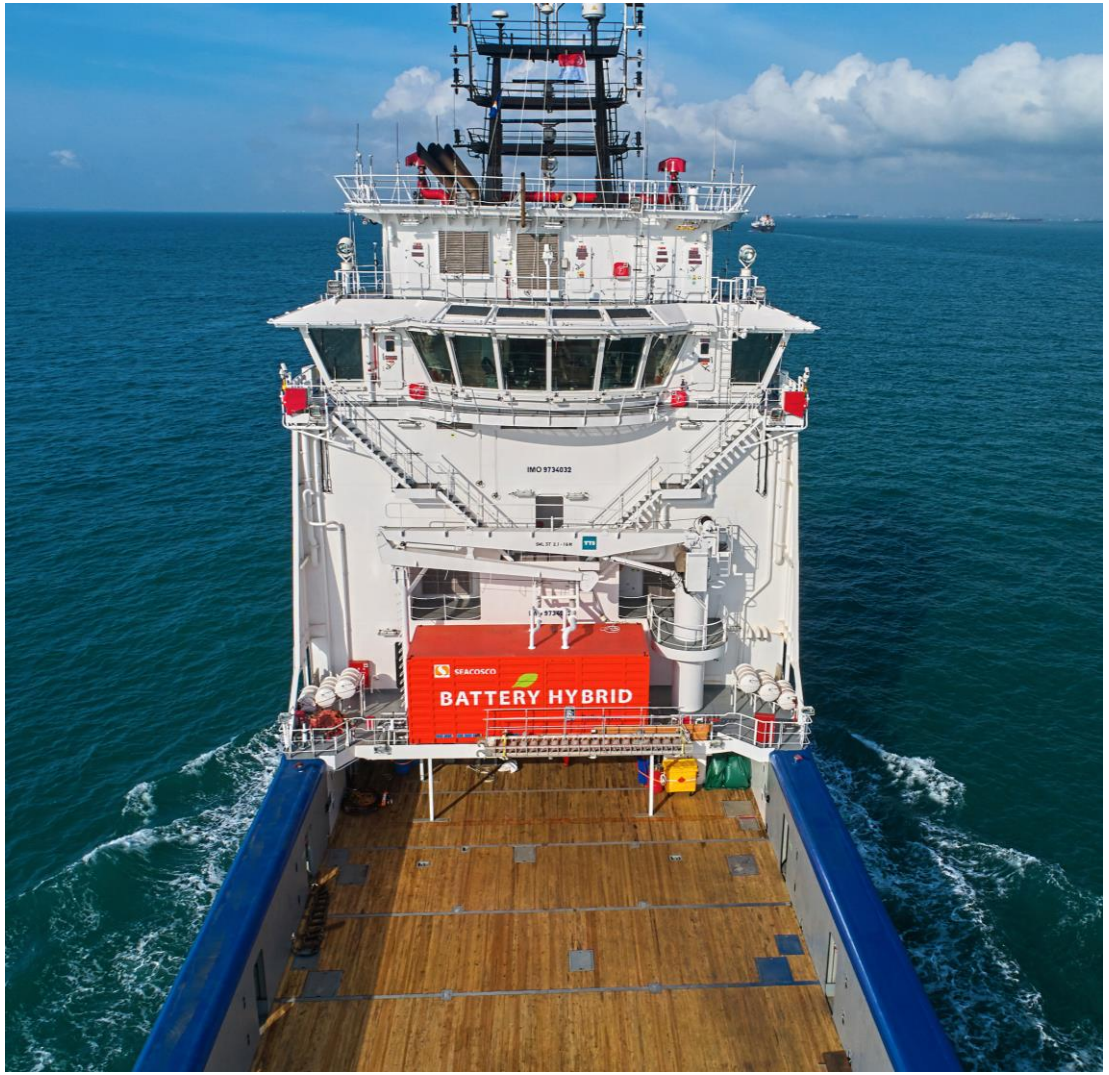


Hybrid Technology Meets Carbon Challenge

1. Up to **20% fuel savings** in normal operations, reducing emissions

2. **Enhanced redundancy** from immediately available power

3. **Upgrade potential** from more power in same physical footprint as battery technology evolves



Transition to the Future

- **Hydrogen mixed with diesel in existing marine engines**
  - HydroCat pilot project with Vattenfall – early 2021 commencement
    - CO_2 reductions of 40–60% from conventional diesel, depending on power output required
    - Similar reductions in NOx as well
- **Cold Ironing in port on full hydrogen with portable gen-set**
- **Fuel cells using Green Hydrogen / Ammonia**
  - Ultra low emissions leading to zero emissions
  - Power to X – harnessing green hydrogen

Incremental innovation begins long-term revolution


the
FUTURE
is NOW
SEACOR
MARINE
SEACOSCO CONGO
MAJURO
BOB
BATTERY HYBRID
UT 771 WP
RESCUE ZONE